

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

The College of Education

Part II

Announcement of Program for the Year
1926-1927



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FRESHMAN WEEK

Every student entering any department of the University for the first time as a freshman in the fall of 1926 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 17, Saturday, September 18, or Monday, September 20, to begin the process of registration. Those coming later than 5:00 p.m. Monday, September 20, will be subject to the usual penalty for late registration. See Penalty Fees, page 50 of the bulletin of general information.

During the week September 21 to 25, 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 17, in order to avoid the inconvenience and delay incident to the congestion on the last day.

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							
1	2	3	4	5	6	7	..	..	1	2	3	4	5	..	1	2	3	4	5	6
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	..	..	..
..	
SEPTEMBER							MARCH							SEPTEMBER							
..	..	..	1	2	3	4	..	..	1	2	3	4	5	..	..	..	..	1	2	3
5	6	7	8	9	10	11	6	7	8	9	10	11	12	4	5	6	7	8	9	10	
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	..	..	..
..	
DECEMBER							JUNE							DECEMBER							
..	..	..	1	2	3	4	..	..	..	1	2	3	4	..	..	..	..	1	2	3
5	6	7	8	9	10	11	5	6	7	8	9	10	11	4	5	6	7	8	9	10	
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
..	

UNIVERSITY CALENDAR

1926-27

1926

Fall Quarter

September	16	Thursday	Payment of fees closes, except for new students
September	16-18		Entrance examinations (for removal of entrance deficiencies)
September	17-20		Registration of all new students entering the freshman class
September	20-24		Examinations for removal of conditions Registration period ¹
September	21-25		Freshman week
September	24	Friday	Payment of fees for new students closes
September	24-25		Necessary changes in registration
September	27	Monday	Fall quarter classes begin, 8:30 ² a.m.
October	21	Thursday	Senate meeting, 4:30 p.m.
November	2	Tuesday	General Election Day; a holiday
November	11	Thursday	Armistice Day; a holiday
November	20	Saturday	Homecoming Day
November	25	Thursday	Thanksgiving Day; a holiday
December	2	Thursday	State Day Convocation
December	15-18		Final examination period
December	16	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	18	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	22	Wednesday	Payment of fees closes for all students in residence fall quarter ²

Winter Quarter

December	27-29		Entrance examinations
December	30-31		Registration days for new students ¹ Necessary changes in registration

¹ Registration subsequent to the date specified will necessitate the approval of the Students' Work Committee by petition. See also penalty fees for late registration, general information bulletin, page 50.

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 8:00 in the Medical School and at 8:15 at University Farm.

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

1927			
January	3	Monday	Christmas vacation ends, winter quarter classes begin, 8:30 ² a.m.
February	12	Saturday	Lincoln's Birthday; a holiday
February	17	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Tuesday	Washington's Birthday; a holiday
March	16-19		Final examination period
March	17	Thursday	Payment of fees closes for all students in residence winter quarter ³
March	19	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.

Spring Quarter

March	21-23		Entrance examinations
March	25-26		Registration days for new students ¹ Necessary changes in registration
March	28	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ² a.m.
April	15	Friday	Good Friday; a holiday
May	12	Thursday	Cap and Gown Day Convocation
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day; a holiday
June	8-11		Final examination period
June	11	Saturday	Spring quarter closes, 5:20 p.m.
June	12	Sunday	Baccalaureate service
June	13	Monday	Fifty-fifth annual commencement

Summer Session

June	17-18		Summer Session first term begins, registration and payment of fees
June	20	Monday	Classes begin, 8:00 a.m.
July	4	Monday	Independence Day; a holiday
July	30	Saturday	Registration and payment of fees for second term closes
August	1	Monday	Second term classes begin
September	3	Saturday	Second term Summer Session closes

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² First hour classes begin at 8:00 in the Medical School and at 8:15 at University Farm.

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

PROGRAM

GENERAL COURSES

No.	Title	Hour	Day	Bldg.	Instructor
Ed.208f	Methods in Ed. Research..... (2 cred.; grad.)	I, II	S	113Ed	Mr. Haggerty, Mr. von Borgersrode
Ed.228f-229w- 230s	Problems of College Education... (6 cred.; grad.)	7:30-9:30 p.m.	M	Ar	Mr. Haggerty

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 (3 cred.; jr., sr.; prereq., Ed. 55) (Limited to students in special curricula for superintendents and high school principals)	I	TThS	210OL	Mr. Kefauver
Ed.Ad.65f	The High School..... (3 cred.; jr., sr.; prereq., Ed. 55)	III	TThS	210OL	Mr. Koos
Ed.Ad.65w	The High School..... (3 cred.; jr., sr.; prereq., Ed. 55)	III	TThS	210OL	Mr. Koos
Ed.Ad.65s	The High School..... (3 cred.; jr., sr.; prereq., Ed. 55)	III	TThS	210OL	Mr. Kefauver
Ed.Ad.113f	High School Curriculum..... (3 cred.; sr., grad.; prereq., 10 hrs. in education including Ed. 55)	X	MWF	112Ed	Mr. Kefauver
Ed.Ad.115af- 115bw-115cs	Practice Supervision (9 cred.; sr., grad.)	Tues. a.m. & ar	Ar	Ar	Mr. Brueckner, Mr. Peik
Ed.Ad.119f	Elementary School Curriculum... (3 cred.; sr., grad.; prereq., 1, 3)	I	MWF	ArEd	Mr. Peik
Ed.Ad.119Tw- 120Ts	Elementary School Curriculum... (4 cred.; sr., grad.; prereq., 1, 3)	I, II	S	113Ed	Mr. Peik
Ed.Ad.121w	Educational Advising of Women and Girls (3 cred.; jr., sr., grad.; prereq., 15 qtrs. cred. in ed. and psy.)	Ar	Ar	Ar	Miss Blitz
Ed.Ad.123s	Supervision of High School In- struction (3 cred.; sr., grad.; prereq., 10 hrs. in education)	I	TThS	ArEd	Mr. Koos
Ed.Ad.124f	Educational Administration (3 cred.; sr., grad.; prereq., 10 hrs. in education)	IX	MWF	210OL	Mr. Engelhardt
Ed.Ad.124aw- 124bs	Educational Administration (4 cred.; sr., grad.; prereq., 10 hrs. in education)	III, IV	S	113Ed	Mr. Peik
Ed.Ad.125w	City School Administration..... (3 cred.; sr., grad.; prereq., Ed. 124)	IX	MWF	210OL	Mr. Engelhardt

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
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.133s	Guidance in Secondary Schools.. (3 cred.; prereq., 10 hrs. in education including Ed.Psy. 55)	IV VIII	TS Th		Mr. Koos
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.)	III, IV	S	ArEd	Mr. Brueckner
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.162s	Elementary School Supervision... (2 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.167w-168s	Junior High School..... (4 cred.; sr., grad.; prereq., 10 hrs. in education including Ed. 55)	IX, X	T	Ar	Mr. Kefauver
Ed.Ad.169f	Extra-Curricular Activities..... (2 cred.; prereq., 10 hrs. in education including Ed.Psy. 55)	IX, X	T	Ar	Mr. Koos
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
Ed.Ad.178f	School Surveys..... (6 cred.; sr., grad.)	X	MWF	ArEd	Mr. Engelhardt
Ed.Ad.179w	School Surveys..... (6 cred.; sr., grad.)	VIII	MWF	ArEd	Mr. Engelhardt
Ed.Ad.205f-206w-207s	Seminar in Ed. Admin.....	IX, X	Th	Ar	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

COLLEGE OF EDUCATION

AGRICULTURAL EDUCATION

Major Adviser: A. V. Storm

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
Ag.Ed.11f	Principles of Vocational Education (3 cred.; jr., sr.; † no prereq.)	III	MWF	202Ad	
Ag.Ed.11w,s	Principles of Vocational Education (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. Nylin, Mr. Lathrop
Ag.Ed.42f,w,s	Teaching (3 cred.; jr., sr.; †* prereq., 41, 131)	Ar	Ar	Ar	Mr. Field, Mr. Nylin, Mr. Lathrop
Ag.Ed.75w,s	Visual Presentation (3 cred.; jr., sr.; prereq., 11)	Lect. VI	M	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, VII VI	WF MWF	202Ad 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
Ag.Ed.121	<i>Teachers' Course, Home and School Gardening</i> (2 cred.; prereq., division ap- proval)	<i>Not offered in 1926-27</i>			
Ag.Ed.131w,s	Methods in Teaching High School Agriculture (5 cred.; jr., sr.; †* prereq., 41)	III	MTWThF	202Ad	Mr. Field
Ag.Ed.141w,s	Supervised Practice in Vocational Agriculture (3 cred.; sr.; † prereq., 11)	Ar	Ar	Ar	Mr. Field
Ag.Ed.151w,s	Organization and Management.. (5 cred.; sr.; † prereq., 11, 21)	IV	MTWFS	202Ad	Mr. Storm, Mr. Lathrop
Ag.Ed.153w,s	Consolidated Rural Schools..... (3 cred.; jr., sr.; prereq., 11)	Ar	Ar	Ar	Mr. Selke
Ag.Ed.154	Rural Education and Community Life (3 cred.; jr., sr.; prereq., 11)	Ar	Ar	Ar	Mr. Selke

* 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.

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
Ag.Ed.155	Consolidated Rural School Problems (3 cred.; jr., sr.; † prereq., 11, 153, or equiv.)	Ar	Ar	Ar	Mr. Selke
Ag.Ed.171w,s	Problems in Procedure..... (3 cred.; sr.; † prereq., 42, 131, or equiv.)	Ar	Ar	Ar	Mr. Lathrop
Ag.Ed.176s	Problems in Visual Presentation.. (3 cred.; jr., sr.; prereq., 75)	Ar	Ar	Ar	Mr. Field
Ag.Ed.191f-192w-193s	Seminar in Agricultural Education (6 cred.; sr.; † prereq., 11 cred.)	Ar	Ar	Ar	Mr. Storm, Mr. Lathrop, Mr. Field

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	402F	Miss Raymond, Miss Clousing
		2 III (IV)	TThS	404F	Miss Raymond, Mrs. Hanley
ArtEd.20f-21w-22s	Principles of Harmony in Form and Color (9 cred.; soph., jr., sr.; prereq., 2, 3)	(I) II (III)	TThS	406F	Mr. Hilpert
ArtEd.50s	Commercial and Industrial Design (3 cred.; jr., sr.; prereq., 1, 2, 3, 4, 5, 7, 8, or ar.)	(VI) VII (VIII)	MWF	404F	Mr. Hilpert
ArtEd.51	Commercial and Industrial Design	Not offered in 1926-27			
ArtEd.53f-54w	Design for the Consumer..... (6 cred.; jr., sr.; prereq., 1, 2, 3, 7, 8, 9, and 20, 21, 22 or 50, 51)	VI (VII)	MWF	402F	Miss Raymond
ArtEd.55su	Fundamental Art Principles..... (1 cred.; all; no prereq.)	Ar	Ar		

DRAWING

ArtEd.4,5,6f,w,s	Still Life Drawing..... (3 cred.; all; no prereq.) (Limited to 20)	Sec. 1 I, II	M	404F	Miss Clousing
		2 III, IV	W	404F	Miss Clousing
		3 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	W	401F	Mr. Hilpert
		2 III, IV	W	401F	Mrs. Hanley
		3 II, III	F	404F	Mr. Hilpert
		4 I, IV	F	404F	Miss Clousing
ArtEd.10f-11w-12s	Graphic Composition (3 cred.; all; no prereq.)	Sec. 1 I, II	M	402F	Miss Raymond
		2 II, III	M	401F	Miss Raymond

† Offered only to those preparing to teach.

* Hours in parentheses are laboratory hours and may be arranged to suit the individual.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
ArtEd.23,24, 25f,w,s	Water Color (3 cred.; soph., jr., sr.; prereq., 4, 5, 6)	Sec. 1 2	I, II (II) III (IV)	M 406F M 406F	Mr. Hilpert Mr. Hilpert
ArtEd.26,27, 28f,w,s	Charcoal, Pencil, and Pen Tech- niques (3 cred.; soph., jr., sr.; prereq., 4, 5, 6)	Sec. 1 2	(II) III (IV) I (IV)	W 406F F 406F	Mr. Hilpert Mr. Hilpert
ArtEd.29,30, 31f,w,s	Sketch, Course II..... (3 cred.; soph., jr., sr.; prereq., 7, 8, 9)	Sec. 1 2 3	I, II II, III III, IV	F 401F F 402F F 401F	Miss Raymond Miss Raymond, Miss Clousing Miss Raymond
ArtEd.60,61, 62f,w,s	Advanced Water Color..... (See 23, 24, 25) (3 cred.; soph., jr., sr.; prereq., 25)				Mr. Hilpert
ArtEd.63,64, 65f,w,s	Advanced Techniques (See 26, 27, 28) (3 cred.; soph., jr., sr.; prereq., 28)				Mr. Hilpert
ArtEd.66,67, 68f,w,s	Advanced Sketch (See 29, 30, 31) (3 cred.; soph., jr., sr.; prereq., 31)				Miss Raymond

HANDICRAFTS

ArtEd.32w	Cardboard and Paper Construction (1 cred.; all; no prereq) (Limited to 20)	Sec. 1 2	V (VI) (VII) VII (VIII) (IX)	W 406F W 406F	Miss Ross Miss Ross
ArtEd.33w	Bookbinding (2 cred.; all; no prereq.) (Limited to 20)	Sec. 1 2	V (VI) (VII) VI(VII)(VIII)	W 406F TTh 406F	Miss Ross Miss Ross
ArtEd.35	Clay Modeling				Not offered in 1926-27
ArtEd.37f	Basketry (2 cred.; all; no prereq.)	Sec. 1 2	V (VI) (VII) VI(VII)(VIII)	TTh 406F TTh 404F	Miss Ross Miss Ross
ArtEd.38f	Elementary Weaving and Allied Crafts (1 cred.; all) (Limited to 15)	Sec. 1 2	V (VI) (VII) VI(VII)(VIII)	W 406F W 404F	Miss Ross Miss Ross

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
ArtEd.39su	Advanced Basketry	Ar	Ar	Ar	Miss Ross
ArtEd.40su	Advanced Weaving	Ar	Ar	Ar	Miss Ross
ArtEd.41f	Elementary Pottery	VI(VII)(VIII)	MF	411F	Miss Ross
	(2 cred.; all; no prereq.) (Limited to 15)				
ArtEd.42w	Advanced Pottery	VI(VII)			
	(2 cred.; all; prereq., 4r)	(VIII)	MWF	411F	Miss Ross
ArtEd.43s	Advanced Pottery—Continued ...				
ArtEd.44s	Application of Design to Fabrics..				
	(2 cred.; all; prereq., 1, 2)				
	Sec. 1	V (VI) (VII)	TTh	406F	Miss Ross
	2	VI(VII)(VIII)	TTh	404F	Miss Ross
ArtEd.45w	Application of Design in Needle-				
	craft	(VII) VIII	MWF	411F	Miss Ross
	(2 cred.; soph., jr., sr.; prereq., 1, 2, 3)				
ArtEd.46s	Metal Work	VIII (IX)	MWF	411F	Miss Ross
	(2 cred.; jr., sr.; prereq., 1,2, 3)				

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 1926-27*

TEACHER TRAINING

ArtEd.80f-81w- 82s	Types of Art Instruction.....	IV	S and ar	402F	Mrs. Hanley
	(3 cred.; jr., sr.; prereq., 9 cred. in design, 9 cred. in drawing, 6 cred. in handicrafts)				
ArtEd.83s	Teachers' Course in Art.....	VI (VII)	MWF	402F	Miss Raymond
	(3 cred.; sr.; prereq., 12 cred. in design, 12 cred. in drawing, 6 cred. in handicrafts)				
ArtEd.86,87, 88f,w,s,su	Practice Teaching in Art.....				
	(6 cred.; sr.; prereq., 9 cred. in design, 9 cred. in drawing, 6 cred. in handicrafts)				
	Sec. 1	VI, VII	TTh	Public Schools	Miss Raymond
	2	Ar	Ar	Univ. High School	Mr. Hilpert

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

NOTE.—Handicraft courses are especially recommended to those desiring training for occupational therapy or other forms of social service.

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.

EDUCATIONAL PSYCHOLOGY

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

No.	Title	Hour	Day	Bldg.	Instructor
Ed.Psy.55f	Educational Psychology	I	MWF	Psy	Mr. Miller
	(3 cred.; jr., sr.; prereq., 6 cred. in psy.)				
Ed.Psy.55w,s	Educational Psychology	I	MWF	Psy	Mr. Miller
	(See 55f)				

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
Ed.Psy.55Tf- 56Tw	Educational Psychology (for teachers) (4 cred.; jr., sr.; prereq., 6 cred. in psy.)	III, IV	S	Psy	Ar
Ed.Psy.106f- 107w-108s	Advanced Educational Psychology (9 cred.; jr., sr., grad.; prereq., 55 or equiv.)	III	MWF	Psy	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	Th	Ar	Mr. Van Wagenen
Ed.Psy.116f	Elementary Statistical Methods.. (2 cred.; jr., sr., grad.)	VIII, IX	T	Psy	Mr. von Borgers- rode
Ed.Psy.116w	Elementary Statistical Methods.. (See 116f)	III, IV	S	Ar	Ar
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.; prereq., Psy 1, 2 or 6 and 4 additional cred. in econ., ed., or psy.)	IX, X	F	115Psy	Mr. Paterson
Ed.Psy.134f- 135w-136s	Mental Tests and Mental Diagnosis (6 cred.; sr.; grad.; prereq., 55 or equiv.)	VII, VIII	MW	Psy	Mr. Miller
Ed.Psy.134af- 134bw	Mental Tests and Mental Diagnosis (2 cred.; sr., grad.; prereq., 55 or equiv.)	I, II	S	Psy	Ar
Ed.Psy.138w- 139s†	Experimental Educational Psychology (4 cred.; sr., grad.; prereq., 55 or equiv.)	IX, X	WF	Psy	Mr. Rockwell
Ed.Psy.143f- 144w†-145s	Individual Mental Examination.. (6 cred.; sr., grad.; prereq., 55 and 111 or 134. Permission of instructor)	I, II	S	Psy	Mr. Rockwell
Ed.Psy.149f- 150w†-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. Rockwell

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

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
Ed.Psy.153f-154w-155s	Research Problems	Ar	Ar	Ar	Mr. Haggerty, Mr. Miller
	(Ar.; sr., grad.; prereq., consult instructor)				
Ed.Psy.157f	Ontogenetic Psychology	IX	TTh	Psy	Mr. Rockwell
	(3 cred.; jr., sr.; prereq., 6 cred. in psy.)	X	T		
Ed.Psy.184s	Mental Deficiency	III, IV	S	Psy	Mr. Rockwell
	(2 cred.; jr., sr., grad.; prereq., 55 or equiv.)				
Ed.Psy.191w	Systematic Ed. Psychology.....	III	MTThF	Ar	Mr. Rockwell
	(4 cred.; sr., grad.; prereq., 12 credits in psy. and ed. psy.)				
	(Not open to students receiving credit for Ed. Psy. 106-107-108)				
Ed.Psy.192w-193s	The Psychology of Behavior Problems in Children.....	III, IV	S	Psy	Mr. Blanton
	(4 cred.; jr., sr., grad.; prereq., 15 cred. in psy. and ed.)				
Ed.Psy.197f-198w-199s	Seminar: Problems in Subnormality	Ar	Ar	Ar	Ar
	(6 cred.; jr., sr., grad.)				
Ed.Psy.201f-202w-203s	Seminar in Ed. Psychology.....	IX, X	M	Ed	Mr. Haggerty, Mr. Miller, Mr. Van Wagenen, Mr. Rockwell
	(No cred.; grad.)				

HISTORY AND PHILOSOPHY OF EDUCATION

Major Advisers: Mr. Krey, Miss Alexander, Mr. Finney

No.	Title	Hour	Day	B'dg.	Instructor
H.Ed.1f	Brief Course in History of Education				
	(5 cred.; jr., sr.; prereq., 6 cred. in psy.)				
	Sec. 1	II	MTWThF	210OL	Miss Alexander
	2	IV	MTWFS	204Ed	
H.Ed.1w,s	Brief Course in History of Education	II	MTWThF	210OL	Miss Alexander
	(See 1f)				
H.Ed.3f	Educational Sociology				
	(3 cred.; jr., sr.; prereq., 6 cred. in psy.)				
	Sec. 1	I	MWF	210OL	Mr. Finney
	2	III	MWF	210OL	Mr. Finney
H.Ed.3w,s	Educational Sociology	III	MWF	210OL	Mr. Finney
	(See 3f)				
H.Ed.5s	Public Education in the U. S.	VIII	MWF	ArHE	Miss Alexander
	(Offered at U. Farm)				
	(3 cred.; jr., sr.; prereq., 6 cred. in psy.)				

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
H.Ed.101f	Foundation of Modern Education (3 cred.; jr., sr., grad.; prereq., 6 cred. in psy. and 6 cred in hist.)	VIII	MWF	206Ed	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.)	VIII	MWF	206Ed	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.140w- 141s	Topics in the History of Educa- tion (6 cred.; sr., grad.; prereq., per- mission of instructor)	VI, VII VI	W F	ArOL	Mr. Krey
H.Ed.187f- 188w-189s	Seminar in Educational Sociology (6 cred.; grad.; prereq., Ed. 1 or 101-102-103 and 3)	I, II	S	206OL	Mr. Finney

HOME ECONOMICS EDUCATION

Major Adviser: Wylle B. McNeal

No.	Title	Hour	Day	B'dg.	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,w,s	Special Methods of Teaching Home Economics (5 cred.; jr., sr.; prereq., H.E. 13, 22, Psy. 1-2, Agr.Ed. 11 or 55)	VIII	MTWThF	213HE	Miss Brown, Miss Rose
H.E.Ed.43w	Organization and Methods for Re- lated Art Teaching..... (3 cred.; jr., sr.; prereq., H.E. 42 or parallel 52, 131 or parallel)	III	TThS	402HE	Miss H. Gold- stein
H.E.Ed.46f,w	Observation and Teaching: Re- lated Art (8 cred.; sr.; prereq., 42, 43 or parallel H.E. 13 and 53)				
	Lect. Teaching	IX 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. Teaching	IX Ar	TTh Ar	313HE Ar	Miss McFarland Miss Rose
H.E.Ed.48f,w,s	Observation and Teaching: Tex- tiles and Clothing..... (8 cred.; sr.; prereq., H.E. 42 and 53)				
	Lect. Teaching	IX Ar	TTh Ar	213HE Ar	Miss Keever Miss Sell, Miss Landis

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
H.E.Ed.49f,w,s	Observation and Teaching: General Home Economics..... (8 cred.; sr.; prereq., H.E. 42)				
	Lect.	IX	TTh	213HE	Miss Keever
	Teaching	Ar	Ar	Ar	Miss McFarland
H.E.Ed.141f	Home Economics Problems in Vocational Education (2 cred.; sr.; prereq., H.E.Ed. 42)	Ar	Ar	Ar	Miss Brown, Miss McNeal
H.E.Ed.142s	Educational Measurement in Home Economics (2 cred.; sr.; prereq., Ed.Psy. 55, H.E.Ed. 42)	Ar	Ar	Ar	Miss Brown
H.E.Ed.242f,w,s	Home Economics Education Seminar (1-5 cred.; grad.)	Ar	Ar	Ar	Miss Brown

INDUSTRIAL EDUCATION

Major Adviser: Homer J. Smith

No.	Title	Hour	Day	Bldg.	Instructor
Ind.10f	<i>Methods, Elementary Grade Woodwork</i>	<i>Not offered in 1926-27</i>			
Ind.11w	<i>Special Class Woodwork (Women)</i> (Except by request of adviser to teachers of subnormal children or head of department of Art Education)	<i>Not offered in 1926-27</i>			
Ind.12s	<i>Methods, Elementary Electric Wiring</i>	<i>Not offered in 1926-27</i>			
Ind.14s	Methods of Teaching Drawing... (2 cred.; all; prereq., 10 cred. in draw. or consent of instructor)	IX, X	T	115Ed	Mr. McGee
Ind.20w	Industrial History (2 cred.; all; no prereq.)	IX, X	W	222OL	Mr. McGee
Ind.25f	Literature of Industrial Education (2 cred.; all; no prereq.)	IX, X	T	222OL	Mr. Smith
Ind.30f	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	Selection and Organization of Related Materials (2 cred.; all; Ind. 40)	IX, X	W	222OL	Mr. Smith
Ind.50f,51w,52s	Practice Teaching (6 cred.; jr., sr.; prereq., Ed. 15, Ind. 80, and any one of Ind. 65, 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 (2 cred.; jr., sr.; prereq., Ind. 60)	IX, X	M	222OL	Mr. Prosser
Ind.65f	<i>Methods in Non-vocational Subjects</i>	<i>Not offered in 1926-27</i>			
Ind.66w	Methods in Related Subjects..... (2 cred.; jr., sr.; prereq., Ind. 40)	IX, X	T	222OL	Mr. Smith

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
Ind.70w	Methods in Shop Subjects..... (2 cred.; jr., sr.; prereq., Ind. 40)	IX, X	Th	222OL	Mr. Smith
Ind.80s	Organization and Supervision of General Industrial Training.... (2 cred.; all; no prereq.)	IX, X	Th	222OL	Mr. Smith
Ind.110w	Guidance in the Schools..... (2 cred.; jr., sr., grad.; prereq., Ed.Psy. 134)	III, IV	S	222OL	Mr. Smith
Ind.150f-151w- 152s	Problems in Vocational Education (6 cred.; consent of instructor)	7:30-9:30 p.m.	M	222OL	Mr. Prosser
Ind.170f	Administration of Vocational Ed- ucation (Day schools)..... (2 cred.; jr., sr., grad.; no pre- req.)	IX, X	Th	222OL	Mr. Craig
Ind.171w	Administration of Vocational Ed- ucation (Evening schools)..... (2 cred.; jr., sr., grad.; prereq., 171)	IX, X	F	222OL	Mr. Bass
Ind.172s	Administration of Vocational Ed- ucation (Part-time classes).... (2 cred.; jr., sr., grad.; prereq., 171 and 172)	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 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	B'dg.	Instructor
Lib.Ed.7f	School Library Organization..... (2 cred.; jr., sr.)	VII (30 prac. hrs. to be ar.)	M	117Ed	Miss Penrose
Lib.Ed.8w	Cataloging (2 cred.; jr., sr.; prereq., 7f)	VII (30 prac. hrs. to be ar.)	M	117Ed	Miss Penrose
Lib.Ed.9s	Reference Work (2 cred.; jr., sr.)	VII (30 prac. hrs. to be ar.)	M	117Ed	Miss Penrose
Lib.Ed.10f	Book Selection (1 cred.; jr., sr.)	VII	W	117Ed	Miss Penrose
Lib.Ed.11w	Book Selection (1 cred.; jr., sr.)	VII	W	117Ed	Miss Penrose
Lib.Ed.12s	Book Selection (1 cred.; jr., sr.)	VII	W	117Ed	Miss Penrose

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. Taylor and others
	2	III	TTh	A	
	3	VI	TTh(f,w)	A	
			MTh(s)		
	4	VII	TTh(f,w)	A	
			MTh(s)		
	5	VIII	TTh(f,w)	A	
			MTh(s)		

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor	
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	MTh	A	
Phys.Ed.4f	Freshman Hygiene (No cred.; fr.; A-H inclusive; no prereq.)	Sec. 1	II	T	301F	Dr. Cooke and others
		2	IV	T	300F	
		3	II	F	301F	
Phys.Ed.4w	Freshman Hygiene (See 4f; fr.; I-R inclusive)	Sec. 1	IV	T	301F	Dr. Cooke and others
		2	II	F	300F	
		3	IV	S	301F	
Phys.Ed.4s	Freshman Hygiene (See 4f; fr.; S-Z inclusive)	Sec. 1	III	M	301F	Dr. Cooke and others
		2	IV	T	300F	
		3	II	F	301F	
Phys.Ed.7f-8w-9s	Advanced Leaders (3 cred.; soph., jr., sr.; prereq., 1-2-3)	Sec. 1	IV	T	A	
			II	TTh		
		2	IV	T	A	
			III	TTh		
		3	IV	T	A	
			VI	TTh		
		4	IV	T	A	
			VII	TTh		
5	IV	T	A			
	VIII	TTh				
6	II	MWF	A			
7	III	MWF	A			
8	IV	MWF	A			
Phys.Ed.10f- 11w-12s	Minor Sports (6 cred.; soph., jr., sr.; prereq., 1-2-3)	Lect.	IV	S	A	Mr. Keller
		Lab.	IV	MWF		
Phys.Ed.13f- 14w-15s	Corrective Work (No. cred.; by petition only)	Sec. 1	II	TTh	S	Mr. Iverson
		2	III	TTh		
		3	IV	TS		
Phys.Ed.16f- 17w-18s	Drill Substitution (No. cred.; by petition only)	Sec. 1	II	MWF	S	Mr. Iverson
		2	III	MWF		
		3	IV	MWF		

No.	Title	Hour	Day	Bldg.	Instructor
Phys.Ed.19f- 20w-21s	Gymnastics	III	MWF	A	Mr. Keller, Mr. Taylor
Phys.Ed.22f-23w	(3 cred.; jr., sr.; prereq., 1-2-3) Kinesiology	VII	TTh	A	Mr. Keller
Phys.Ed.24s	(4 cred.; jr., sr.; prereq., 1-2-3, Anat. 4) Technique of Gymnastic Teaching	VI	TTh	A	Mr. Keller
Phys.Ed.28f	(2 cred.; jr., sr.; prereq., 22-23, Anat. 4) Physical Examination and Normal Diagnosis	III	MWF	A	Dr. Cooke
Phys.Ed.29w	(2 cred.; sr.; prereq., Physiolo. 57-58) Orthopedic and Remedial Gym- nastics	III	MWF	A	Dr. Cooke
Phys.Ed.30s	(2 cred.; sr.; prereq., 22-23-24, 29) Athletic Training	I	MWF	A	Dr. Cooke
Phys.Ed.31f	(2 cred.; sr.; prereq., none) History of Physical Education....	II	TThS	A	Mr. Keller
Phys.Ed.32w	(2 cred.; sr.; prereq., Ed. 1) Principles of Physical Education..	II	TThS	A	Mr. Keller
Phys.Ed.33s	(3 cred.; sr.; prereq., 31, 10-11- 12, 23-24) Organization and Administration of Physical Education.....	II	MWF	A	Mr. Luehring
Phys.Ed.37s	(3 cred.; sr.; no prereq.) Football Coaching	Lect. VI Lab. Ar	MWF	Ar A	
Phys.Ed.38w	Basket-Ball	VI	MWF	A	
Phys.Ed.39s	(2 cred.; sr.; no prereq.) Track Athletics	VII	MWF	A	
Phys.Ed.42f	(2 cred.; sr.; no prereq.) Baseball	VI	MWF	A	
Phys.Ed.43f- 44w-45s	Practice Teaching	Ar	Ar	A	Mr. Keller
	(6 cred.; sr.; prereq., 10-11-12, 22-23-24, Ed. 55)				

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 stu- dents; 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

* 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.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor	
Phys.Ed.4f	Preliminary Hygiene (No cred.; required of all students; no prereq.)	Sec. 1	I	M	201WGm	Dr. Norris
		2	II	T	201WGm	
		3	III	W	201WGm	
		4	IV	M	201WGm	
		5	VI	T	201WGm	
		5	VI	T	201WGm	
Phys.Ed.4w	Preliminary Hygiene (See 4f)	III	W	201WGm	Miss Anderson	
Phys.Ed.4s	Preliminary Hygiene (See 4f)	II	T	201WGm	Miss Anderson	
Phys.Ed.7f-8w*	Sophomore Physical Training.... (No cred.; soph.; prereq., 1-2-3)	IV	TS	153WGm	Miss Conger	
Phys.Ed.9s	Archery (No cred.; soph.; prereq., 1-2-3)	III	MF	Ar	Ar	
Phys.Ed.10f-11w-12s‡	Sophomore Orthopedic Gymnastics (No cred.; soph.; prereq., 1-2-3)	IV	TS	3WGm	Dr. Tolg	
Phys.Ed.10f-11w‡	Sophomore Orthopedic Gymnastics (See 10-11-12)	Sec. 1	VI	TTh	3WGm	Miss Denny
		2	III	MW	3WGm	Miss Denny
Phys.Ed.13f-14w-15s	Sophomore Interpretive Dancing.. (No cred.; soph.; prereq., 1-2-3)	VI	TTh	151WGm	Miss Baker	
Phys.Ed.13f-14w*	Sophomore Interpretive Dancing.. (See 13f-14w-15s)	III	MW	151WGm	Miss Bockstruck	
Phys.Ed.13s	Sophomore Interpretive Dancing.. (See 13f-14w-15s)	III	MW	151WGm	Miss Bockstruck	
Phys.Ed.16f-17w	Sophomore Games and Folk Dancing	I	TTh	151WGm	Ar	
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	
		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	

* 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.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
Phys.Ed.22f,s-23w§*	Sophomore Elem. Swimming..... (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	IV (11:30)	MW	51WGm	Miss Conger
	2	IV (12:00)	MW	51WGm	Miss Conger
	3	VII	MW	51WGm	Miss Clayton
	4	II	TTh	51WGm	Miss Clayton
	5	IV	TS	51WGm	Miss Clayton
	6	VII	TTh	51WGm	Miss Conger
	7	VIII (3:30)	TTh	51WGm	Miss Clayton
	8	VIII (4:00)	TTh	51WGm	Miss Clayton
	9	III	MW	51WGm	Miss Clayton
Phys.Ed.25f,s-26w§*	Sophomore Intermediate Swimming (No cred.; soph.; prereq., 1-2-3, elementary swimming test)				
	Sec. 1	VIII½ (4:00)	MW	51WGm	Miss Conger
	2	III	ThS	51WGm	Miss Conger
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.31f,s	Sophomore Life Saving and Water Sports	IX	MW	Ar	Ar
	(No cred.; soph., jr., sr.; prereq., 1-2-3, and adv. swimming test)				
Phys.Ed.37f-38w	Freshman Major Sports.....	I (fall)	TTh	151WGm	Miss Conger
	(No cred.; fr. majors in phys. ed.)	VI½ (winter)	MW		
Phys.Ed.40f	Freshman Major Hygiene.....	III	W	201WGm	Miss Anderson
	(1 cred.; fr.; no prereq.)	I	S		
Phys.Ed.43f-44w-45s	Play and Playground.....	<i>Not offered in 1926-27</i>			
	(3 cred.; jr., sr.; prereq., 6 quar- ters)				
Phys.Ed.50w	Gymnastics for Freshmen.....	I	TTh	153WGm	Miss Conger
	(No cred.; fr. majors in phys. ed.; no prereq.)	III	F		
Phys.Ed.51f-52w	Gymnastics for Sophomores.....	II	TTh	153WGm	Miss Hazelton
	(1 cred.; soph. majoring or jrs. minoring; prereq., 1-2-3)				
Phys.Ed.54f-55w	Gymnastics for Juniors.....	II	MW	153WGm	Miss Lane
	(1 cred.; jrs. majoring and srs. minoring; prereq., 51-52)				
Phys.Ed.56w-57s	Swimming with Technique.....	I (fall)	M	51WGm	Miss Conger
	(1 cred.; soph., jr.; prereq., Phys.Ed. 28)	II (fall)	TTh	51WGm	
		VII (winter)	MF		
		I (spring)	TTh		

§ 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.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
Phys.Ed.58w-59s	Advanced Folk Dancing with Technique	I (winter)	MWF	151WGm	Miss Baker
	(2 cred.; jr.; prereq., 6 qtrs.)				
Phys.Ed.60f	Minor Sports with Technique	I	MWF	153WGm	Miss Clayton
	(1 cred.; jr.; prereq., 6 qtrs.)				
Phys.Ed.61s	Minor Sports with Technique	VI	MTTh	153WGm	Miss Clayton
	(See 60f)				
Phys.Ed.63f-64w-65s	Major Sports with Technique	VI (f,w)	MTTh		Miss Hazelton
	(3 cred.; soph., jr.; prereq., 3, 37-38)	II (s)	MTTh	151WGm	Miss Clayton
Phys.Ed.66f-67w-68s	Interpretive Dancing	VII	TThF	151WGm	Miss Baker
	(3 cred.; jr.; prereq., 6 qtrs.)				
Phys.Ed.69f-70w-71s	Advanced Interpretive Dancing with Technique	IV	MTS	151WGm	Miss Baker
	(2 cred.; sr.; prereq., 66-67-68)				
Phys.Ed.72f-73w	Gymnastics for Seniors	I (9:00) (f)	MF	151WGm	Miss Baker
	(1 cred.; sr.; prereq., 54-55)	I (9:00) (w)	WF	151WGm	Miss Baker
Phys.Ed.75w	History of Physical Education	VI	TTh	201WGm	Miss Hazelton
	(2 cred.; jr., sr.; prereq., Ed. 1)				
Phys.Ed.76w	Physical Diagnosis and Prophylaxis	<i>Not offered in 1926-27</i>			
	(2 cred.; sr.; prereq., Physiol. 57-58)				
Phys.Ed.80f-81w	Kinesiology	III	TThS	201WGm	Miss Baker
	(3 cred. fall, 4 cred. winter; jr.; prereq., Anat. 3, Farm Engr. 23)	II	F		
Phys.Ed.82s	Physical Examination	III	MWF	201WGm	Dr. Tolg
	(2 cred.; jr.; prereq., 80-81)				
Phys.Ed.83s	Technique of Gymnastic Teaching	II	MWF	Ar	Miss Baker
	(3 cred.; jr.; prereq., 54-55, 80-81)	VIII½	TThF	201WGm	
Phys.Ed.84f	Principles of Gymnastics				
	(2 cred.; sr.; prereq., 54-55, 83)				
	Lab.	I	W	201WGm	Miss Hazelton
	Lect.	II	MW	201WGm	Miss Hazelton
Phys.Ed.85w-86s	Principles of Physical Education	II (w)	MW	201WGm	Miss Baker
	(2 cred. winter, 1 cred. spring; prereq., 44, 84, 91)	IV (s)	W		
Phys.Ed.87s	Personal and School Hygiene	II	MWF	201WGm	
	(3 cred.; sr.; prereq., Physiol. 57-58)				
Phys.Ed.88f-89w-90s	Orthopedic and Remedial Gym.				
	(3 cred.; sr.; prereq., 82)				
	Lab.	II (fall)	TTh	3WGm	Dr. Tolg
	Lect.	II (fall)	W	201WGm	Dr. Tolg
	Lab.	II (winter)	T	3WGm	Dr. Tolg
	Lect.	II (winter)	W	201WGm	Dr. Tolg
					(Practice Teaching ar)
	Lab.	Ar (spring)			
	Lect.	IV (spring)	F	201WGm	Dr. Tolg
Phys.Ed.91f	Principles of Dancing	VII	MW	151WGm	Miss Baker
	(2 cred.; sr.; prereq., 66-67-68)				

COLLEGE OF EDUCATION

Phys.Ed.92f- 93w-94s	Practice Teaching	Ar	Ar	Ar	Miss Baker and others
	(6 cred.; sr.; prereq., 43-44-45, 56-57, 63-64-65, 69, 91, 83)				
Phys.Ed.97w	Organization and Administration	IV	WF	201WGM	Dr. Norris
	(3 cred.; sr.; prereq., 75)	II	Th		

COURSES FOR WHICH NO REGISTRATION IS REQUIRED

Phys.Ed.31f,w,s	Life Saving	IX	MW	51WGM	Miss Conger
Phys.Ed.32f,w,s	General Swimming	IX	TThF	51WGM	
	(No cred.; all; no prereq.)				
Phys.Ed.33-34-35*	Hockey, Basket-Ball, and Baseball	IX	MTWTh	151WGM	Miss Clayton, Miss Hazel- ton, 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	Mr. Giddings
	(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	VII	Th	3Mu	Mr. Pepinsky
	(3 cred.; jr., sr.; prereq., 1, 2, and 3 or equiv.)				
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 Teach- ing	I	MW	4Mu	Mr. Pepinsky
Mu.Ed.81f- 82w-83s	Observation of Teaching.....	Ar	Ar	Ar	Mr. Giddings
	(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 Instruc- tion	IV	MWF	210OL	Mr. Hudelson
	(3 cred.; jr., sr.; prereq., Ed. 55)				
T.15f	Technique of High School Instruc- tion	III	MWF	204Ed	Mr. Hudelson
	(Limited section) (See 15f,w,s)				
T.16f,w,s	Practice Teaching	Ar	Ar	Ar	Mr. Turney
	(5 cred.; sr., grad.; prereq., Ed. 15 and Special Methods Course)				

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

No.	Title	Hour	Day	Bldg.	Instructor
T.17s	Practice Teaching of Subnormal Children (2 cred.; jr., sr.)	Ar	Ar	Ar	Mr. Turney
SPECIAL METHODS					
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.39f	<i>Social Science for Junior High Schools</i> (2 cred.; jr., sr.)	<i>Not offered in 1926-27</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 1926-27</i>			
T.43	<i>The Teaching of English in the Elementary School</i> (2 cred.; jr., sr.; prereq., Ed. 37f)	<i>Not offered in 1926-27</i>			
T.44	<i>Children's Literature</i> (2 cred.; jr., sr.; prereq., Ed. 37f)	<i>Not offered in 1926-27</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 1926-27</i>			
T.46w	Practice Teaching with Special Methods (5 cred.; jr., sr.)	Ar	Ar	Ar	Mr. Peik
T.47	<i>Field Problems in High School Training Departments</i> (2 cred.; jr., sr.)	<i>Not offered in 1926-27</i>			
T.50f	The Teaching of Composition in the Junior High School (2 cred.; jr., sr.)	III, IV	S	Ar	Miss Smith
T.51w	The Teaching of English in the Junior High School (2 cred.; jr., sr.)	III, IV	S	206Ed	Miss Smith
T.52f-53w-54sf	Teachers' Course in English and Practice Teaching (9 cred.; jr., sr.; prereq., Ed. 15)	VIII	TTh	205Ed	Miss Inglis

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
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
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. Smith
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	TTh	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	Miss Hubman
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 Denneen
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	Miss Violet
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.148f	Teachers' and Supervisors' Course in Arithmetic for Lower Grades (2 cred.; jr., sr., grad.; prereq., 15 cred. in ed.)	I, II		S Ar	Mr. Brown
T.149w	Teachers' and Supervisors' Course in Arithmetic for Intermediate and Upper Grades..... (2 cred.; jr., sr., grad.; prereq., 15 cred. in ed.)	I, II		S Ar	Mr. Brown
T.150f,w	Normal School Teaching and Administration (4 cred.; jr., sr., grad.; prereq., 15 cred. in ed.)	III, IV		S Ar	Mr. Brown
T.181w	Technique of Elementary Instruction (3 cred.; jr., sr., grad.; 9 hrs. in education including Ed.Psy. 55)	I		MWF ArEd	Mr. Peik

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
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	112Ed	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)	I, II	S	Ar	Mr. Hudelson

ANIMAL BIOLOGY

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	B'dg.	Instructor
1f-2w†	General Zoology (10 cred.; all; no prereq.)				Mr. Minnich
	Sec. 1 Lab. (Limit, 150) Lect.	III, IV III	MWF TThS	101AB	
	Sec. 2 Lab. (Limit, 150) Lect.	IV VI, VII VI, VII	T MWF TTh	313AB 101AB 313AB	
1w-2s†	General Zoology (See 1f-2w)				Mr. Sigerfoos
	Sec. 1 Lab. Lect.	I, II I II	MWF T TThS	101AB T 313AB	
1s-(2su† or 2w†)	General Zoology (See 1f-2w)				
	Lab. Lect.	VI, VII, VIII VI, VII	WF MTh	101AB 313AB	Ar
5f-6w-7s†	General Zoology (12 cred.; pre-medical and pre-dental students; no prereq.)				
	Sec. 1 Lab. (Pre-dental) Lect.	I, II I	TS MWF	101AB 313AB	Mr. Ringoen
	Sec. 2 Lab. (Pre-medical) Lect. (Spring) Lab. Lect.	III, IV IV III, IV IV	TS MWF WF MTS	101AB 313AB 101AB 313AB	Mr. Sigerfoos

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

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
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.; prereq., 1-2, chem. or phys. desirable)	VI, VII, VIII	MW	Ar	Mr. Minnich
22s	General Ecology (5 cred.; fr., soph., jr., sr.; prereq., 1-2)	VI, VII, VIII	MW	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. Ringeon
26w	Comp. 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
31f	General Physiology (5 cred.; soph., jr., sr.; prereq., 15 cred. in an. biol. or 10 cred. in an. biol. and 10 cred. in chem. or phys.)	VI, VII, VIII	MW	10AB	Mr. Lund
32w	General Physiology (5 cred.; soph., jr., sr.; prereq., as for 31)	VI, VII, VIII	MW	10AB	Mr. Lund
33s	Principles of Animal Behavior (5 cred.; soph., jr., sr.; prereq., 15 cred. in an. biol. or 10 cred. in an. biol. and 10 cred. in chem. or phys. or psy.)	VI, VII, VIII	MW	10AB	Mr. Lund
37f-38w-39s†	General Entomology (9 cred.; soph., jr., sr.; prereq., 1-2)	I, II	MWF	208AB	Ar
44s	Animal Parasites (3 cred.; fr., soph., jr., sr.; prereq., 1-2)	VI, VII, VIII	WF	208AB	Mr. Riley
45w	Insects and Disease (3 cred.; fr., soph., jr., sr.; prereq., 1-2)	VI, VII, VIII	WF	208AB	Mr. Riley
46w-47s†	Ornithology (6 cred.; soph., jr., sr.; prereq., 1-2 and permission of instructor)	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.

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
107s	Protozoology (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1-2)	I, II	MWF	211, 213AB	Mr. Sigerfoos
108w,s	Experimental Zoology (6 cred.; jr., sr., grad.; prereq., 15 cred. in an. biol. or An. Biol. 1-2 and Psy. 1-2)	IV	WF and Ar	10AB	Mr. Minnich
109f-110w-111s	General Physiology (15 cred.; jr., sr., grad.; prereq., 20 cred. in an. biol.)	Ar	Ar	Ar	Mr. Lund
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	Ar
130w	Biology of Aphididae..... (3 cred.; jr., sr., grad.; prereq., 20 cred. incl. 1-2)	III, IV	MWF	208AB	Ar
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
154f,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	MWF	201, 211AB	Ar
183s	Genetics and Eugenics..... (3 cred.; jr., sr., grad.; prereq., 1-2 and 5 other cred. in an. biol. or botany)	IV	MWF	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	Introd. to Anthropology..... (5 cred.; jr., sr.; prereq., 10 cred. of a science and 10 cred. of a social science)	VI	MTWThF	15F	Mr. Jenks and Mr. Wallis
53	<i>Cultural Anthropology: Technology</i> (3 cred.; jr., sr.; prereq., 51)	<i>Not offered in 1926-27</i>			
54s	Cultural Anthropology: Social Organization (3 cred.; jr., sr.; prereq., 51)	II	TThS	15F	Mr. Wallis
55w	Human Migrations with Special Reference to Immigration..... (3 cred.; jr., sr.; prereq., 51)	II	MWF	15F	Mr. Jenks
56w	Primitive Science (3 cred.; jr., sr.; prereq., 51)	II	TThS	15F	Mr. Wallis
62f	Ethnology (3 cred.; jr., sr.; prereq., 51)	IV	MWF	15F	Mr. Jenks
80w	The American Indian..... (3 cred.; jr., sr.; prereq., 51)	II	MWF	12F	Mr. Wallis
106f	Prehistoric Man (3 cred.; jr., sr.; prereq., 51)	III	MWF	15F	Mr. Jenks
108	<i>Philippine Peoples</i> (3 cred.; jr., sr.; prereq., 51)	<i>Not offered in 1926-27</i>			
110f	Physical Anthropology (3 cred.; jr., sr.; prereq., 51)	II	TThS	12F	Mr. Wallis
112s	The American Negro..... (3 cred.; jr., sr.; prereq., 51)	III	MWF	15F	Mr. Jenks
113s	Peoples of Europe..... (3 cred.; jr., sr.; prereq., 51)	IV	MWF	15F	Mr. Jenks
121w	Advanced Phys. Anthropol. (3 cred.; jr., sr.; prereq., 110)	Ar		Ar 12F	Mr. Wallis

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
123W-124S	Problems in Anthropology..... (6 cred.; jr., sr., grad.; prereq., three courses)	VII-VIII	Th	12F	Mr. Jenks
161S	Primitive Religion (3 cred.; jr., sr.; prereq., 51)	II	MWF	12F	Mr. Wallis

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

Major Adviser: Mr. Mann

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
21f-22wf-23S	Freehand Drawing (6 cred.; soph., jr., sr.; prereq., soph. standing)				
31f-32wf-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 Shadows, Perspective				
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.; pre- req., 23)				
81f	Color and Design..... (2 cred.; stud. of dram.; prereq., Pub. Speak. 91-92-93†)				
134-135-136f,w,s	Interior Decoration Design..... (21 cred.; sr.; prereq., 34-35-36)				
163S	History of Sculpture and Painting (2 cred.; jr., sr.; prereq., 14-15- 16)				
182f-183W	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.

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

‡ May be taken at the same time.

COLLEGE OF EDUCATION

ASTRONOMY

Major Adviser: Francis P. Leavenworth

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

BACTERIOLOGY

MEDICAL SCHOOL

Major Advisers: Arthur T. Henrici, Winford P. Larson

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
51w,s	General Bacteriology (See 51f)	VI, VII, VIII	MWF	MH	Ar

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
101f	Special Bacteriology for Medical Students (4 cred.; jr., sr.; prereq., 51)	I, II I, II, III	ThS T	MH	Ar
103s	Special Bacteriology for Students of Agriculture (5 cred.; jr., sr.; prereq., 51)	I, II, III I, II	TS Th	MH	Ar
105f	Food Bact. (3 cred.; jr., sr.; prereq., 51)	VII, VIII	TTh	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
118f	Morphology and Taxonomy of Bacteria (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
119f-120w	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	Common Fermentations	See Medical School bulletin.			
125f	Industrial Bacteriology	See Medical School bulletin.			
150f-151w, or 150w-151s	Advanced Bacteriology (Cred. ar.; jr., sr.; prereq., see instructor)	VII, VIII	TTh	MH	Ar

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Introductory Courses

No.	Title	Hour	Day	Bldg.	Instructor
1f	Plant Pathology (5 cred.; jr., sr.; prereq., bot. 9 cred.)				
7w-8s	Weeds and Grasses (6 cred.; soph., jr., sr.; prereq., bot. 9 cred.)				
9f	Weeds and Seed Testing (3 cred.; soph., jr., sr.; prereq., bot. 9 cred.)				
10f	Forest Pathology (5 cred.; soph., jr., sr.; prereq., bot. 9 cred.)				
10s	Forest Pathology (See 10f)				
12w	Seed Problems (3 cred.; jk., sr.; prereq., 9)				

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

Advanced Courses

No.	Title	Hour	Day	Bldg.	Instructor
105f-106w-107s	Mycology				
	(9 cred.; jr., sr.; prereq., 1 or 10 or equiv.)				
108f	Methods				
	(3 cred.; jr., sr.; prereq., 1 or 10, Bact. 51)				
110w	Principles of Pathology.....				
	(4 cred.; jr., sr.; prereq., 1 or 10, Bact. 51)				
111w	Diseases of Field Crops.....				
	(3 cred.; jr., sr.; prereq., 1 or 10)				
112s	Diseases of Fruit Crops.....				
	(3 cred.; jr., sr.; prereq., 1 or 10)				
113	Diseases of Vegetable Crops.....				
	(3 cred.; jr., sr.; prereq., 1 or 10)	Not offered in 1926-27			
114w	Advanced Forest Pathology.....				
	(3 cred.; jr., sr.; prereq., 1 or 10)				
116f	Pathological Histology				
	(3 cred.; jr., sr.; prereq., 1 or 10)				
118s	Plant Disease Control.....				
	(3 cred.; jr., sr.; prereq., 1, Ent. 3)				

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

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				Mr. Huff
	(10 cred.; all; no prereq.)				
	Sec. 1	Lab. I, II	MWF	212, 214, 220P	
		Quiz I	T	212, 214, 220P	
		Lect. II	TThS	210P	
	2	Lab. VI, VII	MWF	212, 214, 220P	
		Quiz VII	Th	210P	
		Lect. VI, VII	T	210P	
	3	Lab. III, IV	MWF	210P	
		III, IV	TS	(fall)	
		III	Th	(winter)	
		Lect. and quiz with either Sec. 1 or 2.	1 hr ar		
1w-2s†	General Botany				Mr. Huff
	(See 1f-2w)				
		Lab. III, IV	MWF	212, 214, 220P	
		Quiz IV	T	212, 214, 220P	
		Lect. III	TThS	210P	
1s-(2f)†	General Botany				Mr. Huff
	(See 1f-2w)				
		Lab. I, II	TThS	212, 214, 220P	
		Quiz I	W	212, 214, 220P	
		Lect. II	MWF	210P	

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

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No. (1s)-2f†	Title	Hour	Day	Bldg.	Instructor
	General Botany				Mr. Huff
	(See 1f-2w)				
		Lab.	I, II	TThS 212, 214, 220P	
		Quiz	I	W 212, 214, 220P	
		Lect.	II	MWF 210P	
7s	Taxonomy of Flowering Plants... (5 cred.; all; prereq., 2)	Lab.	I, II	MWF 212, 214, 220P	Mr. Rosendahl
		Quiz	I	S 210P	
		Lect.	I	TTh 210P	
12w	Morphology of Algae..... (3 cred.; all; prereq., 2)		I, II	TThS 104AB	Miss Tilden
13	Morphology of Fungi..... (3 cred.; all; prereq., 2)	Not offered in 1926-27			
21s	Elementary Ecology	III, IV	MTWFS	G	Mr. Cooper
22f,s	Elementary Plant Physiol. (5 cred.; all; prereq., 2, and Inorg. Chem. 6-7-8 or 9-10)	III, IV	MTWFS	G	Mr. Harvey
51f	Histological Methods	I, II	MWF	213AB	Miss Thompson
62w	Bryophytes and Pteridophytes.... (3 cred.; jr., sr.; prereq., 15 cred.)	Ar		Ar Ar	Mr. Huff
63s	Gymnosperms and Angiosperms.. (3 cred.; jr., sr., grad.; prereq., 7* or 62)	VI, VII, VIII	TTh	Ar	Mr. Butters
101f	Elementary Biometry	Ar		Ar Ar	Mr. Harris
108	Pteridophytes	Not offered in 1926-27			
	(5 cred.; jr., sr., grad.; prereq., 7 and 62)				
110s	Gymnosperms	Ar		Ar Ar	
	(5 cred.; jr., sr., grad.; prereq., 7 and 63)				
113f-114w-115s	Adv. Taxonomy	VI, VII	MWF	213AB	Mr. Rosendahl
	(9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 7)				
118w	Cytology	VI, VII, VIII	TTh	213AB	Mr. Rosendahl
	(3 cred.; jr., sr., grad.; prereq., 18 cred.)				
123s	Algae: Blue-Green	I, II	TThS	104AB	Miss Tilden
	(3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)				
124w	Algae: Green	III, IV	TThS	104AB	Miss Tilden
	(3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)				
125s	Algae: Brown	VI, VII, VIII	TTh	104AB	Miss Tilden
	(3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)				

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

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
126w	Algae: Red (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)	VI, VII, VIII	TTh	104AB	Miss Tilden
127s	Anatomy of Vascular Plants..... (5 cred.; jr., sr., grad.; prereq., 18 cred.)	Ar	Ar	213AB	Mr. Butters
131f	Field Ecology (5 cred.; jr., sr., grad.; prereq., 21)	VI, VII, VIII	MWF	G	Mr. Cooper
132w	Ecological Anatomy (5 cred.; jr., sr., grad.; prereq., 21)	III, IV	MTWFS	G	Mr. Cooper
133s	Forest Geography of North Amer- ica (5 cred.; jr., sr., grad.; prereq., 21)	VI, VII	MWF	G	Mr. Cooper
134s	Research Methods in Ecology.... (5 cred.; jr., sr., grad.; prereq., 21)	VI, VII, VIII	MWF	G	Mr. Cooper
141f	Physical Phases of Plant Physi- ology (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	I, II	MTWThF	G	Mr. Harvey
142w	Plant Metabolism (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	I, II	MTWThF	G	Mr. Harvey
143s	Plant Metabolism and Growth.... (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	I, II	MTWThF	G	Mr. Harvey
144s	Plant Microchemistry (5 cred.; sr., grau.; prereq., 22 and gen. org. chem.)	Ar	Ar	G	Mr. Harvey
145f,w,s	Advanced Biometry (3 cred.; sr., grad.; prereq., 101)	Ar	Ar	Ar	Mr. Harris

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 or 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 Lab. VI, VII VIII, IX	MWF TTh TTh	225C 110C	Mr. Reyerson Mr. Reyerson and assistants

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

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
4f-5w†	Gen. Inorg. Chemistry (pre-med. and pre-dent.) (8 cred.; pre-dent., pre-med. only; prereq., entrance cred. in chem.)	Lect. VI Lab. VI, VII VIII, IX	MWF TTh TTh	100C 210C	Mr. Stephens Mr. Stephens and assistants
6f-7w†-8s	Gen. Inorg. Chemistry..... (15 cred.; those entering without chem.; no prereq.)	Lect. II Lab. I, II, III	MWF ThS	225C 210C	Miss Cohen Miss Cohen and assistants
9f-10w†	Gen. Inorg. Chemistry..... (10 cred.; all; prereq., entr. cred. in chem.)	Lect. II Lab. I, II, III	MWF ThS	100C 290C	Mr. Sneed Ar
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. VI, VII VIII, IX	MWF TTh TTh	100C 210C 210C	Mr. Stephens Mr. Stephens
12f-13w†	Qual. Chemical Analysis..... (10 cred.; all; prereq., 8 or 10)	Fall Lect. I Lab. VI, VII, VIII Winter Lect. I Lab. VI, VII, VIII	TThS MW TTh MWF	325C 290C 325C 290C	Mr. Maynard
12s†	Qual. Chemical Analysis..... (See 12f-13w†)	Lect. II Lab. I, II, III	MWF ThS	100C 290C	Mr. Sneed Mr. Sneed and assistants
13f†	Qual. Chemical Analysis..... (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 Analysis.... (2 or 3 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)	Ar	Ar	290C	Mr. Sneed

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

No.	Title	Hour	Day	B'dg.	Instructor
103f-104w-105s	Adv. Inorg. Chemistry..... (3 to 9 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)	IV	MWF	111C	Mr. Sneed
ANALYTICAL CHEMISTRY					
1w-2s(20-21)*	Quant. Analysis (10 cred.; soph., jr., sr.; prereq., Inorg. Chem. 12-13)	Lect. VI Rec. VI Lab. VII-IX VI-IX		M 325C F 315C MF 310C W 310C	Mr. Geiger
7f(27)	Quant. Analysis (pre-med.)..... (4 cred.; pre-med. only; prereq., Inorg. Chem. 11 or 13)	Lect. VI Rec. VI Lab. VII-IX VI-IX		M 325C W 315C F 310C W 310C	Mr. Geiger
	Sec. 1 (Limit 30)	Lect. VI Rec. VI Lab. VII-IX VI-IX		M 325C W 315C F 310C W 310C	
	2 (Limit 30)	Lect. VI Rec. VI Lab. VII-IX VI-IX		M 325C F 315C MF 310C W 310C	
	3	Lect. VI Rec. VI Lab. VII-IX VI-IX I-IV VII-IX		M 325C Th 315C T 310C S 310C Th 310C	
7w,s(27)	Quant. Analysis (See 7f)	Lect. VI Rec. VI Lab. VII-IX I-IV		Th 325C T 410C TTh 310C S 310C	Mr. Sarver
123f-124w-125s	Adv. Analytical Chemistry..... (3 to 9 cred.; jr., sr., grad.; prereq., 1, 2, or 7)	Lect. VI Lab. VII-IX VI-IX		T 315C T 310C Th 310C	Mr. Sarver
127f-128w-129s	Chemistry of Rare Elements..... (9 cred.; jr., sr., grad.; prereq., 1, 2)	Ar		Ar Ar	Mr. Brinton
ORGANIC CHEMISTRY					
6w-7s†(31-32)	Elem. Organic Chemistry..... (8 cred.; pre-med.; prereq., Inorg. Chem. 11)	Lect. IV Sec. 1 (Limit 80) 2 (Limit 30, pre-med. only) 3 4‡		MWF 100C TTh 390C WF 390C TTh 390C WF 390C	Mr. Smith Mr. Smith

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

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

() Numbers in parentheses are the old course numbers.

‡ Students repeating Org. Chem. 6 must schedule this section. Students taking Org. Chem. 6 for the first time are not permitted to enter this section.

PROGRAM

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No.	Title	Hour	Day	B'dg.	Instructor
51f-52w†-53s (35-36-37)	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

PHYSICAL CHEMISTRY

101f-102w-103s (140-141-142)	Physical Chemistry				Mr. MacDougall
	(9, 12, or 15 cred.; jr., sr., grad.; prereq., 2 yrs. col. chem., 1 yr. col. phys.)				
	Lect.	IV	MWF	325C	
	Lab.	VI-VIII	F	15C, 117C	
	Rec.	IV	S	115C	
110f,w(143)	Physical Chemistry (medic.)....				
	(4 cred.; pre-med. and biol. stu- dents; prereq., Org. Chem. 7)				
	Lect.	VI	TTh	225C	Mr. Taylor
			F	325C	
	Sec. 1	Lab.	MW	15C	
	2		TTh	117C	
116f-117w-118s (146-147-148)	Adv. Physical Chemistry.....	Ar	Ar	Ar	
	(9 or 12 cred.; jr., sr., grad.; prereq., 103 and calculus)				
129s(149)	Prin. of Colloidal Chemistry.....	Ar	Ar	Ar	Mr. Reyerson
	(2 cred.; sr., grad.; prereq., 102)				
130(150)	Appl. of Colloidal Chemistry.....	<i>Not offered in 1926-27</i>			
	(2 cred.; sr., grad.; prereq., 102)				
131f-132w-133s (157-158-159)	Colloid Chemistry Lab.	Ar	Ar	Ar	Mr. Reyerson
	(Cred. ar.; sr., grad.; prereq., 129 or 130)				
143s	Magnetochemistry	Ar	Ar	Ar	Mr. Taylor
	(3 cred.; jr., sr., grad.; prereq., 103)				

TECHNOLOGICAL CHEMISTRY

100f-101w-102s (161-162-163)	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 advanced courses in Organic Chem., see bulletin of the School of Chemistry.

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

() Numbers in parentheses are the old course numbers.

COLLEGE OF EDUCATION

AGRICULTURAL BIOCHEMISTRY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Introductory Courses

No.	Title	Hour	Day	Bldg.	Instructor
3f-4w	Types of Carbon Compounds.... (6 cred.; soph., jr., sr.; prereq., chem. 10 cred.)				
3w-4s	Types of Carbon Compounds.... (See 3f-4w)				
7f-8w	General Agricultural Biochemistry (10 cred.; soph., jr., sr.; prereq., chem. 10 cred.)				
7w-8s	General Agricultural Biochemistry (10 cred.; soph., jr., sr.; prereq., chem. 10 cred.)				
15f	Principles of Animal Nutrition... (3 cred.; jr., sr.; prereq., 7-8)				

Advanced Courses

101f-102w	Agricultural Quantitative Analysis (6 cred.; jr., sr.; prereq., 7-8)				
103s	Dairy Chemistry				
106f	Chem. Tech. of Agricultural Prod- ucts				
108s	Chemistry of Wheat and Wheat Products				
110s	Flour Laboratory Methods.....				
111f,su-112w,su	Phytochemistry				
113f,su-114w,su- 115s	Biochemical Laboratory Methods.. (6 cred.; sr.; prereq., quant. anal., parallel 111-112)				
116w	Advanced Animal Nutrition..... (2 cred.; jr., sr.; prereq., 15 or equiv.)				
117f,w,s,su	Laboratory Problems in Animal Nutrition				
118f,w,s,su	Laboratory Problems in Biochem- istry				

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

CHILD WELFARE

No.	Title	Hour	Day	Bldg.	Instructor
50w-51s†	Nursery School Methods..... (6 cred.; jr., sr.; prereq., 60 and 6 cred. in psy. or ed.)	VI	MWF	212F(W) 217F(S)	Ar
52f-53w-54s†	Nursery School Technique..... (6 cred.; jr., sr.; prereq., 50-51 and permission of instructor)	Ar	Ar	105CWI	Ar

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

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
60f	The Nursery School and Parental Education Movement (2 cred.; jr., sr.; prereq., 6 cred. in psy. and 5 cred. in soc. sci.)	VI	TTh	212F	Miss Dixon
130s	The Development of the Young Child (3 cred.; sr., grad.; prereq., 12 cred. in psy. or equivalent, and permission of instructor)	I	TThS	111OL	Mr. Anderson
170f	Parental Education in Child Care and Training (3 cred.; sr., grad.; prereq., 52-53-54, or H.E. 34, 35, and 44, or 15 cred. in ed. or psy., or soc., or prev. med.)	VI	MWF	212F	Miss Dixon
173w-174s†	Technique and Practice of Parental Education (6 cred.; sr., grad.; prereq., 170, 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)	Ar	Ar	201CWI	Miss Good-enough

COMPARATIVE LITERATURE

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w-103s†	Drama (9 cred.; jr., sr., grad.; prereq., jun. col. requirement in Eng. and foreign lang.)	III	TThS	113F	Mr. Firkins
105f-106w-107s†	Criticism (9 cred.; jr., sr., grad.; prereq., jun. col. requirement in Eng. and foreign lang.)	VI	MWF	113F	Mr. Firkins
110w	Romantic Movement (3 cred.; 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 1926-27</i>			
103	<i>Universal Language</i> (2 cred.; jr., sr., grad.; prereq., see note)	<i>Not offered in 1926-27</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

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
109f-110w-111s†	History of German Lang. (6 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Mr. Klaeber
141f-142w-143s†	Hist. Gram. of Eng. Lang. (6 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Mr. Klaeber

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

DRAWING AND DESCRIPTIVE GEOMETRY

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	B'dg.	Instructor
41-42-43f,w,s	Technical Drawing (6 cred.; all; no prereq.)	VI, VII	MWF	455C	Mr. Schuck, Mr. Levens
	Sec. 1	III, IV	MWF		
	2	VIII, IX	MWF(f,w)		
	3	VIII, IX	MTF(s)		
44f,w,s	Lettering (1 cred.; all; no prereq.)	IV	T	Ar	Mr. Kirchner
	Sec. 1	II	Th	Ar	
45f,w,s	Alphabets (2 cred.; soph., jr., sr.; no pre- req.)	II	TTh	206E	Mr. Kirchner
123f-124w-125s	The Graphic Arts and Sciences.. (3 cred. per qtr.; open to jr., sr., grad.)	II	MWF	208E	Mr. Kirchner

ECONOMICS

Major Adviser: G. W. Dowrie

No.	Title	Hour	Day	B'dg.	Instructor
1f-2w†	Introduction to Economics..... (10 cred; pre-bus. fr.; no prereq.)				Mr. Black and others
	Lect.	III	Th	OLAud	
	Sec. 1	I	TThFS	104B	
	2	I	TThFS	109B	
	3	II	TThFS	209B	
	4	II	TThFS	204B	
	5	III	MWFS	109B	
	6	III	MWFS	104B	
	7	IV	MWFS	209B	
	8	IV	MWFS	109B	
	9	V	MTWF	6B	
	10	VI	MWThF	109B	
	11	VII	MWThF	109B	
	12	VIII	MWThF	6B	
1s-(2f)†	Introduction to Economics..... (See 1f-2w)				Mr. Black and others
	Lect.	III	Th	202B	
	Sec. 1	II	TThFS	204B	
	2	IV	MWFS	213B	
	3	VI	MWThF	109B	

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

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
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 109B 204B 6B	Mr. Dowrie and others
3s	The Mechanism of Exchange..... (See 3w)	Lect. III Sec. 1 I 2 I 3 II 4 II 5 III 6 III 7 IV 8 IV 9 V 10 VI 11 VII 12 VIII	TS TThS TThS TThS TThS MWF MWF MWF MWF MWF MWF MWF MWF	OLAud 6B 102B 102B 209B 213B 204B 109B 204B 202B 202B 209B 209B	Mr. Dowrie and others
4f*	Principles of Economics—Pre-Business Course (5 cred.; soph., pre-bus. only; prereq. 1-2)	Lect. I Sec. 1 I 2 II 3 III 4 IV 5 V 6 VI	M TThFS MWFS TThFS MWFS MTWF MWThF	301F 213B 202B 204B 213B 202B 6B	Mr. Hansen and others
4s*	Principles of Economics—Pre-Business Course (See 4f)	Lect. I Sec. 1 I 2 III 3 VI	M TThFS TThFS MWThF	202B 109B 6B 6B	Mr. Hansen and others
(6s)-7f††	Principles of Economics—General Course (10 cred.; soph., jr., sr.; no prereq.)	Lect. II Sec. 1 II 2 IV	T MWFS MWFS	202B 6B 6B	Mr. Hansen and others
6f-7w††	Principles of Economics—General Course (10 cred.; soph., jr., sr.; no prereq.)	Lect. III Sec. 1 II 2 III 3 V 4 VI	W TThFS TThFS MTWF MWThF	301F 109B(f) 6B(w) 202B(f) 213B(w) 109B 102B(f) 202B(w)	Mr. Hansen 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.

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
6w-7s††	Principles of Economics—General Course (See 6f-7w)	Lect. II Sec. 1 I 2 II 3 IV 4 V 5 VI 6 VII	T TThFS MWFS MWFS MTWF MWThF MWThF	301F 102B(w) 213B(s) 202B 6B 102B 204B 204B	Mr. Hansen and others
6s-(7f)††§	Principles of Economics—General Course (See 6f-7w)	Lect. III Sec. 1 II 2 IV 3 VI	W TThFS MWFS MWThF	202B 213B 104B 209B	Mr. Hansen and others
14s	Elements of Statistics (5 cred.; soph., jr., sr.; prereq., 4 or 6-7)	Sec. 1 I 2 II 3 III 4 IV 5 V 6 VI 7 VII 8 VIII	MTWThF MTWThF MTWThF MTWFS MTWThF MTWThF MTWThF MTWThF	301B 301B 301B 301B 301B 301B 301B 301B	Mr. Mudgett and others
25f-26w†	Principles of Accounting (8 cred.; soph., jr., sr.; no pre- req.)	Lect. Sec. 1 I 2 I 3 II 4 II 5 III 6 III 7 IV 8 V 9 VI 10 II	MWF TThS MWF TThS MWF TThS MWF MWF MWF MWF	301B 301B(fall only) 301B 301B 301B(fall only) 301B 301B(fall) 213B(winter) 301B(fall only) 301B 303B(fall) 213B(winter)	Mr. Heilman and others
25w-26s†	Laboratory sections to be arranged. Principles of Accounting (See 25f-26w)	Lect. Sec. 1 II 2 I 3 III 4 IV 5 VI	MWF TThS MWF MWF MWF	303B 301B 303B 301B(winter) 302B(spring) 302B(winter only)	Mr. Heilman and others

† 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 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
62s	Social Insurance (3 cred.; jr., sr.; prereq., 4 or 6-7)	III	TThS	102B	Mr. Graves
85f,s	Economics of Marketing (3 cred.; jr., sr.; prereq., 4 or 6-7)	Lect. I Sec. 1 I 2 I 3 III	T ThS WF ThS	202B 202B 209B 213B	Mr. Vaile
103f-104w†	Value and Distribution (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	Sec. 1 I 2 VII	MWF MWF	204B 102B	Mr. Garver, Mr. Waite
105S	History of Economic Ideas (The Classical Economists) (3 cred.; jr., sr., grad.; prereq., 103-104)	VII	MWF	102B	Mr. Garver
106	<i>History of Economic Ideas (The Critics of the Classical Economists)</i> (3 cred.; jr., sr., grad.; prereq., 105 or permission of instructor)	<i>Not offered in 1926-27</i>			
108w	Marketing Organization: Agricultural Products (3 cred.; jr., sr., grad.; prereq., 85. 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)	Sec. 1 I 2 III 3 IV 4 VI	MWF TThS MWF MWF	102B 209B 204B 209B	Mr. Dowrie and others
141w	Monetary and Banking Policy (See 141f)	Sec. 1 II 2 IV 3 VIII	TThS MWF MTW	102B 104B 209B	Mr. Dowrie and others
141s	Monetary and Banking Policy (See 141f)	Sec. 1 II 2 VII	MWF MWF	209B 109B	Mr. Dowrie and others
149f	Business Cycles (3 cred.; sr., grad.; prereq., 3 and 4 or 6-7)	VIII	MTW	209B	Mr. Ebersole
149w	Business Cycles (See 149f)	III	MWF	6B	Mr. Myers
149s	Business Cycles (See 149f)	Sec. 1 VIII 2 III	MTW MWF	202B 102B	Mr. Ebersole Mr. Myers

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
153w	Trust Problem (3 cred.; jr., sr., grad.; prereq., 155)	II	MWF	202B	Mr. Stehman
154	Public Utilities (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Econ. 4 or 6-7)	<i>Not offered in 1926-27</i>			
155S	Corporation Finance (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)				Mr. Stehman
	Lect.	III	Th	OLAud	
	Sec. 1	I	TTh	204B	
	2	III	MW	6B	
	3	III	MW	104B	
	4	IV	MW	209B	
	5	II	TTh	109B	
	6	VII	TTh	102B	
161f	Labor Problems and Trade Union- ism (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)				Mr. Hansen
	Lect.	IV	MW	202B	
	Sec. 1	III	F	213B	
	2	IV	F	202B	
161w	Labor Problems and Trade Union- ism (See 161f)				Mr. Hansen
	Lect.	III	TTh	209B	
	Sec. 1	III	S	209B	
	2	IV	S	202B	
162w	Labor and Economic Reform Move- ments (3 cred.; jr., sr., grad.; prereq., 161)	IV	MWF	202B	Mr. Hansen
163S	Economic Aspects of Population and Immigration (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	IV	MWF	202B	Mr. Hansen
170S	Land Economics (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	2:30-4:00	TTh	209B	Mr. Black
172f	Economics of Transportation..... (3 cred.; jr., sr.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	VI	MWF	202B	Mr. Cummings
172w	Economics of Transportation..... (See 172f)	VI	MWF	102B	Mr. Cummings
172S	Economics of Transportation..... (See 172f)	VII	MWF	202B	Mr. Cummings
174S	Transportation Problems (3 cred.; jr., sr.; prereq., 172)	VI	MWF	102B	Mr. Cummings
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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
176s	Commercial Policies (See 176f)	I	MWF	204B	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, Mr. Waite
191f-192w†	Public Finance (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	II	MWF	102B	Mr. Blakey
193s	State and Local Taxation..... (3 cred.; jr., sr., grad.; prereq., 191-192)	II	MWF	109B	Mr. Blakey

ENGLISH

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

REQUIREMENTS OF THE DEPARTMENT

For teacher's certificate in English.—

- 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; Public Speaking 41-42-43 or 45-46.
- English as a minor subject: English 6 and 8 and either 44-45 or 62; Composition 11-12, or 18-19, and 20.
- Public Speaking 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: Public Speaking 41-42-43, and 9 additional hours in public speaking.

No.	Title	Hour	Day	Bldg.	Instructor
Af-Bw-Cs	Freshman English (See Composition)				
1f-2w-3s*	English Survey (9 cred.; soph., jr., sr.; prereq., 9 cred. in composition)	Lect. II IV	M or T	OLAud	
		Sec. 1 II	WF	5F (fall, winter) 217F (spring)	
		2 III	TTh	25F	
		3 V	WF	306F	
		4 VII	TTh	107F	
6f	Chaucer (4 cred.; soph., jr., sr.; prereq., 15 cred. in Fr. Eng.)	Sec. 1 II	TWThS	205F	Mr. Ruud, Mr. Van Winkle
		2 V	MTWF	204F	Miss Carr, Miss Lambert

* Students may enter any quarter.

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
6w	Chaucer				
	(See 6f)				
		Sec. 1	II	TWThS 205F	Mr. Ruud
		2	V	MTWF 204F	Miss Carr, Miss Lambert
6s	Chaucer				
	(See 6f)				
		Sec. 1	II	TWThS 205F	Mr. Hillhouse
		2	V	MTWF 204F	Miss Carr, Mr. Loveland
8f	Shakespeare				
	(4 cred.; soph., jr., sr.; prereq., 15 cred. in Fr. Eng.)				
		Sec. 1	I	TThFS 204F	Miss Jackson, Mr. Nichols
		2	VI	MTThF 204F	Mr. Hillhouse, Mr. Van Winkle
8w	Shakespeare				
	(See 8f)				
		Sec. 1	I	TThFS 204F	Miss Jackson
		2	VI	MTThF 204F	Mr. Hillhouse, Mr. Hessler
8s	Shakespeare				
	(See 8f)				
		Sec. 1	I	TThFS 204F	Mr. Van Winkle
		2	VI	MTThF 204F	Mr. Hillhouse, Mr. Nichols
40	<i>Bible As Literature</i>				<i>Not offered in 1926-27</i>
	(3 cred.; soph., jr., sr.; prereq., 15 cred. in Fr. Eng.)				
41w	Browning and Tennyson	IV		MTWF 204F	Mr. Stoll
	(4 cred.; soph., jr., sr.; prereq., 15 cred. in Fr. Eng.)				
44f-45w†	American Literature	IV		MWF 301F	Mr. Moore
	(6 cred.; soph., jr., sr.; prereq., 15 cred. in Fr. Eng.)				
44w-45s†	American Literature	VI		MWF 301F	Mr. Nichols, Miss Jackson
	(See 44f-45w)				
50f	Old English	III		TThFS 306F	Mr. Ruud
	(4 cred.; jr., sr.; prereq., 15 cred. in Fr. Eng.)				
51	<i>Spenser</i>				<i>Not offered in 1926-27</i>
	(3 cred.; jr., sr.; prereq., 15 cred. in Fr. Eng.)				
53f	Seventeenth-Century Lyristis	III		MTThF 205F	Mr. Moore
	(4 cred.; jr., sr.; prereq., 15 cred. in Fr. Eng.)				
58f-59w†	Nineteenth-Century Prose	II		TThS 204F	Mr. Beach
	(6 cred.; jr., sr.; prereq., 15 cred. in Fr. Eng.)				
60w	History of English Language....	VI		TTh 205F	Mr. Klacber
	(2 cred.; jr., sr.; prereq., 50)				
61	<i>American Pronunciation</i>				<i>Not offered in 1926-27</i>
	(3 cred.; jr., sr.; prereq., 15 cred. in Fr. Eng.)				

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

PROGRAM

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No.	Title	Hour	Day	B'dg.	Instructor
62f	Milton (4 cred.; jr., sr.; prereq., 15 cred. in Fr. Eng.)	VII	MTWF	204F	Mr. Stoll
62w	Milton (See 62f)	VII	MTWF	205F	Mr. Van Winkle
63s	American Usage (3 cred.; jr., sr.; prereq., 15 cred. in Fr. Eng.)	I	MWF	125F	Mr. Ruud
64	Bacon (3 cred.; jr., sr.; prereq., 15 cred. in Fr. Eng.)	<i>Not offered in 1926-27</i>			
66	English Novel (4 cred.; jr., sr.; prereq., 15 cred. in Fr. Eng.)	<i>Not offered in 1926-27</i>			
70f	Elizabethan Drama (4 cred.; jr. sr.; prereq., 8)	VI	MTWF	205F	Mr. Stoll
101f	Middle English (2 cred.; jr., sr., grad.; prereq., 6 and 50)	VI	TTh	217F	Mr. Klaeber
103s	Beowulf (3 cred.; jr., sr., grad.; prereq., 50 and either 6 or 8)	VII, VIII VII	T Th	217F	Mr. Klaeber
105-106†	Eighteenth-Century Poetry (6 cred.; jr., sr., grad.; prereq.‡)	<i>Not offered in 1926-27</i>			
107w-108s†	Eighteenth-Century Prose (6 cred.; jr., sr., grad.; prereq.‡)	VII	MWF	204F	Mr. Moore
109f-110w†	Romantic Poets (6 cred.; jr., sr., grad.; prereq.‡)	III	TThS	204F	Mr. Beach
111-112†	Seventeenth-Century Prose (6 cred.; jr., sr., grad.; prereq.‡)	<i>Not offered in 1926-27</i>			
123f-124w-125s†	Technique of the Novel (9 cred.; sr., grad.; prereq.‡)	4 to 6 o'clock	T	204F	Mr. Beach
129s	Modern Drama (4 cred.; jr., sr., grad.; prereq., 8 and one other course num- bered above 5)	II	MTWF	204F	Mr. Stoll
133w	Ballads (3 cred.; jr., sr., grad.; prereq.‡)	III	MWF	205F	Mr. Ruud
136s	Advanced Shakespeare (4 cred.; jr., sr., grad.; prereq., grade of B in Eng. 8)	I	MTWF	205F	Mr. Stoll
140s	Advanced Chaucer (3 cred.; jr., sr., grad.; prereq., 6 with grade of B, or 6 and one other course numbered above 5)	I, II	S	217F	Mr. Ruud
141f-142w-143s†	Historical Grammar (6 cred.; sr., grad.; prereq.‡)	Ar	Ar	Ar	Mr. Klaeber
146f-147w†	The Metrical Romances (6 cred.; jr., sr., grad.; prereq., 6, and one other course num- bered above 5)	II	MWF	204F	Miss Carr
148-149†	The Arthurian Romances (6 cred.; jr., sr., grad.; prereq., 6, and one other course num- bered above 5)	<i>Not offered in 1926-27</i>			

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

‡ Courses 6 and 8, or either 6 or 8 and one other course numbered above 5.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
150	<i>Victorian Poetry</i> (4 cred.; jr., sr., grad.; prereq.‡)	<i>Not offered in 1926-27</i>			
151s	<i>Recent Poetry</i> (4 cred.; jr., sr., grad.; prereq.‡)	III	TWThS	301F	Mr. Beach
152w-153s†	<i>Pre-Elizabethan Drama</i> (6 cred.; jr., sr., grad.; prereq., 8, and one other course num- bered above 5)	III	TThS	205F	Mr. Van Winkle
155s	<i>American Novel</i> (4 cred.; jr., sr., grad.; prereq., 44-45 and either 6 or 8)	VI	MTThF	205F	Mr. Moore
164s	<i>Dante in English</i> (See Italian 164s)	IV	MWF	213F	Miss Phelps

COMPOSITION

Af-Bw-Cs	Freshman English (15 cred.; all; no prereq.)	Lect.	II	M	OLAud
		Rec.	I	TThFS	*
			II	TThFS	*
		Lect.	IV	T	OLAud
		Rec.	III	MWFS	*
			IV	MWFS	*
		Lect.	II	M	OLAud
			or IV	T	OLAud
		Rec.	V	MTWF	*
			VI	MTThF	*
		VII	MTThF	*	
1w-2s(with Eng. 2w-3s)	Freshman Composition (2 cred. per qtr.; all; no prereq. Cannot be taken separately)	Lect.	II	M	
			or IV	T	OLAud
		Rec.	II	TThFS	*
			IV	MWFS	*
			VI	MTWF	*
3f(with Eng. 1f)	Freshman Composition (See 1w-2s)	Lect.	II	M or T	OLAud
		Rec.	II	TThFS	*
			IV	MWFS	*
			VI	MTThF	*
4f-5w-6s	Composition for Technical Stu- dents (9 cred.; all; no prereq.)	I	MWF	311F	
		II	MWF	311F	
		III (Chemists only)	MWF	225C, 315C	
		I	TThS	311F	

* Assigned at the time of registration.

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

‡ Courses 6 and 8, or either 6 or 8 and one other course numbered above 5.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
4w-5s-(6su)	Composition for Technical Students	II	TThS	311F	
	(9 cred.; all; no prereq.)				
11f-12w†‡	Description; Narration				
	(6 cred.; soph., jr., sr.; prereq., A-B-C, or 4-5-6)				
	Sec. 1	II	MWF	304F	Mr. Hillhouse, Mrs. del Plaine
	2	IV	MWF	305F	Mr. Nichols
	3	VII	MWF	305F	Mrs. Phelan
	4	II	TThS	304F	Miss Gable
	5	III	TThS	304F	Miss Lambert
11w-12s†‡	Description; Narration				
	(See 11f-12w)				
	Sec. 1	II	MWF	306F	Mr. Sutcliffe
	2	II	TThS	306F	Ar
	3	VI	MWF	306F	Miss Gable
18f-19w†‡	Types of Writing.....				
	(6 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6)				
	Sec. 1	III	MWF	304F	Mrs. del Plaine
	2	V	MWF	303F	Mr. Lovelaud
	3	VII	MWF	306F	Ar
18w-19s†‡	Types of Writing.....				
	(See 18f-19w)				
	Sec. 1	III	MWF	306F	Mrs. Phelan
	2	VII	MWF	304F	Mr. Hessler
20f*	Informal Exposition				
	(3 cred.; soph., jr., sr.; prereq., 11-12 or 18-19)				
	Sec. 1	III	MWF	204F	Mrs. Phelan
	2	V	MWF	305F	Mr. Hessler
20s*	Informal Exposition				
	(See 20f)				
	Sec. 1	II	MWF	304F	Mrs. del Plaine
	2	IV	MWF	305F	Mr. Nichols
	3	VI	MWF	304F	Ar
	4	VII	MWF	305F	Mrs. Phelan
	5	II	TThS	304F	Miss Gable
	6	III	TThS	306F	Miss Lambert
31w	Technical Writing				Consult College of Engineering bulletin.
63-64-65	<i>Studies in Structure and Style...</i>				<i>Not offered in 1926-27</i>
	(6 cred.; jr., sr.; prereq., 11-12 or 18-19, and 20)				
67f-68w†	Imitative Writing	IV	MWF	304F	Mrs. Phelan
	(6 cred.; jr., sr., not open to sophomores; prereq., average of B in two quarters‡ of either 11-12, 20 or 18-19, 20)				

* Prerequisite for all advanced courses in writing, for major sequences, except for those students who receive an average of B in 11-12 or 18-19, and for the teacher's certificate in English.

† 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.

† The student who gets an average of B in 11-12 or 18-19 need not take Course 20.

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
69s	Short-Story Writing (4 cred.; jr., sr., not open to sophomores; prereq., average of B in two quarters† of either 11-12, 20 or 18-19, 20)	IV	MTWF	304F	Mrs. Phelan
100w-101s	Versification (6 cred.; jr., sr., grad.; prereq., 11-12 or 18-19, 20; with or after 9 cred. Eng. Poetry)	IV	TS and Ar	302F	Mr. Nichols
111f-112w-113s	Essay Writing (9 cred.; jr., sr., grad.; prereq., 11-12 or 18-19, and 20)	III	MWF	304F	Mr. Sutcliffe
115-116-117	<i>Dramatic Technique</i> (9 cred.; jr., sr., grad.; prereq., 11-12 or 18-19, 20; with or after Eng. 129)	<i>Not offered in 1926-27</i>			
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	Mr. Thomas

PUBLIC SPEAKING

41f-42w-43s†	Public Speaking (9 cred.; soph., jr., sr.; prereq., Fr. Eng. or Comp. 4-5-6)	Lect.	I	F	OLAud	Mr. Rarig and others
		Sec. 1	I	MW	308F	
		2	II	MW	308F	
		3	III	TTh	308F	
		4	VII	MW	19Mu	
		5	I	TTh	3F	
		6	II	TTh	308F	
		7	II	MW	301F (fall, winter) 19Mu (spring)	
			III	MW	19Mu	
41w-42s-(43f)†	Public Speaking (See 41f-42w-43s)	Lect.	VI	Th	OLAud	
		Sec. 1	I	MF	19Mu	
		2	VI	MF	19Mu	
(41w-42s)-43f†	Public Speaking (See 41f-42w-43s)	Lect.	VI	Th	OLAud	
		Sec. 1	II	MF	19Mu	
45f-46w†	Public Speaking (10 cred.; soph., jr., sr.; prereq., Fr. Eng. or Comp. 4-5-6)	Lect.	I	F	OLAud	Mr. Rarig and others
		Sec. 1	IV	MTWS	3F	
		2	VII	MTWTh	308F	
		3	VIII	MTWTh	308F	

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

‡ The student who gets an average of B in 11-12 or 18-19 need not take Course 20.

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
45s-(46f)†	Public Speaking				
	(See 45f-46w)				
	Lect.	VI	Th	301F	
	Sec. 1	IV	MTWS	3F	
	2	VI	MTWF	125F	
	3	VII	MTWF	308F	
(45s)-46f†	Public Speaking				
	(See 45f-46w)				
	Lect.	VI	Th	OLAud	
	Sec. 1	IV	MTWS	204F	
	2	VI	MTWF	308F	
45w-46s†	Public Speaking				
	(See 45f-46w)				
	Lect.	VI	Th	OLAud	
	Rec.	VI	MTWF	308F	
51s	Advanced Public Speaking.....	II	MWF	5F	Mr. Morse
	(3 cred.; jr., sr.; prereq., 41-42-43 or 45-46)				
55f-56w-57s	Arg. and Debating.....	VII	T	301F	Mr. Morse
	(9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	VII, VIII	Th		
61s	Speech Correction	VI	MTThF	101F	Mr. Holmes
	(4 cred.; jr., sr.; prereq., 41-42-43 or 45-46; Psy. 1-2)				
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	Ar
91f-92w-93s	Play Production	VIII	MWF	19Mu	Ar
	(9 cred.; jr., sr.; prereq., 81-82-83, Eng. 8)				
97f,w	Adv. Debate and Oratory.....	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)				
105	<i>Theory of Reading and Acting...</i>				Not offered in 1926-27
	(3 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46)				
107s	Seminar in Great Orators.....	III	MWF	308F	Mr. Rarig
	(3 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46, Psy. 1-2, and 10 cred. in hist., sociol., or phil.)				
121f-122w†	Advanced Speech Problems.....	III	TThS	19Mu	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 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

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
1f	Introd. to Human Geography.... (5 cred.; 3d qtr. fr., soph.; not open to jr., sr.; no prereq.)	II	MWThFS	103OL	Mr. Davis
1w	Introd. to Human Geography.... (See 1f)	II	MTThFS	103OL	Mr. Davis
1s	Introd. to Human Geography.... (See 1f)	II	MTThFS	103OL	Mr. Davis
2w	Introd. to Regional Geography... (5 cred.; 3d qtr. fr., soph.; not open to jr., sr.; prereq., 1 or 33)	VI	MTWThF	103OL	Mr. Hartshorne
23s	Teachers' Course in Geography... (3 cred.; jr., sr.; prereq., 15 cred. in geog. and Ed. 15)	VII	MWF	103OL	Mr. Hartshorne
33w*	Climatology	I	TThF	103OL	Mr. Davis
51w†	Human Geography	III	MTThFS	103OL	Mr. Davis
52s‡	Regional Geography of the World (5 cred.; jr., sr.; prereq., 51 or 33 or 1 and 10 cred. in econ. or sociol.)	III	MTThFS	103OL	Mr. Davis
61f	Geography of Commercial Production	IV	MTWFS	103OL	Mr. Hartshorne
61w	Geography of Commercial Production	IV	MTWFS	103OL	Mr. Hartshorne
61s	Geography of Commercial Production	IV	MTWFS	103OL	Mr. Hartshorne
62s	Trade Routes and Trade Centers... (3 cred.; jr., sr.; prereq., 61)	VI	MWF	103OL	Mr. Hartshorne
71f	Geography of North America.... (4 cred.; jr., sr.; prereq., 1 or 51, or 61, or 20 cred. in soc. sci. to include at least one course in geog.)	I	MWThF	103OL	Mr. Davis

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

† Not open to those who have had Course 1.

‡ Not open to those who have had Course 2.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
91f	Cartography (3 cred.; jr., sr.; prereq., 10 cred. in senior college work in geog., geol., hist., or other subject in which the use of maps is necessary)	VI	MWF	103OL	Mr. Hartshorne
101	<i>Geography of Europe</i>	<i>Not offered in 1926-27</i>			
135S	Geography of Minnesota..... (3 cred.; jr., sr.; prereq., 12 cred., or 20 cred. in soc. sci. incl. at least 8 cred. in geog. Limited to 15. Permission of instructor necessary)	I	TThF	103OL	Mr. Davis
141	<i>Field Course in Geography</i>	<i>Not offered in 1926-27</i>			
151f-152w-153s†	Seminar in Geography..... (3 cred.; prereq., 20 cred.)	VII	Th	103OL	Mr. Davis, Mr. Hartshorne
201f,w,s	Research Problems in Geography..	Ar	Ar		Mr. Davis

GEOLOGY AND MINERALOGY

Major Adviser: G. A. Thiel

No.	Title	Hour	Day	B'dg.	Instructor
1f-2w*†	General Geology (Dynamic and Historical) (10 cred.; all; prereq., any course in chemistry in high school or college)				
	Sec. 1 Lect. I	TWThF	210P	Mr. Thiel	
	Lab. I-II	M or S	112P		
	2 Lect. VII	MTWTh	110P	Mr. Shenon	
	Lab. VI-VII	F	112P		
1f-3w*†	General Geology (Dynamic and Economic) (10 cred.; all; prereq., any course in chemistry in high school or college)				
	Lect. III	MWFS	110P	Mr. Emmons	
	Lab. III-IV	T	112P		
		VI-VII	Th		
1w-2s*†	General Geology (Dynamic and Historical) (See 1f-2w)				
	Lect. IV	TWFS	110P	Mr. Bauernschmidt	
	Lab. III-IV	M	112P		
	or VI-VII	T			
1w-3s*†	General Geology (Dynamic and Economic) (See 1f-3w)				
	Lect. II	WThFS	200aP	Mr. Allison	
	Lab. I-II	T	112P		

* 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.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1s-(2f)*†	General Geology (Dynamic and Historical) (See 1f-2w)	Lect. III Lab. III-IV	MTThF W	110P 112P	Mr. Emmons
(1s)-2f†	General Geology (Dynamic and Historical) (See 1f-2w)	Lect. III Lab. II-III	MTWTh F	104P 112P	Mr. Bauernschmidt
1s-(3w)†	General Geology (Dynamic and Economic) (See 1f-3w)	Hours, days, rooms, as for 1s(2f)			
4s	Geology of Minnesota..... (5 cred.; all; prereq., 1)	IV	MTWFS	110P	Mr. Thiel
8f,w,s‡	Introductory Geology (5 cred.; all; no prereq.)	II	MWThFS	110P	Mr. Thiel
11f	Elements of Paleontology..... (5 cred.; all; prereq., 1)	II	MWThFS	105P	Mr. Stauffer
11f	Elements of Paleontology..... (5 cred.; all; prereq., 1)	II	MWThFS	105P	Mr. Stauffer
15s§	Minerals and Rocks..... (1 cred.; jr., sr.; prereq., 1 or 29)	Ar	Ar	100P	Mr. Gruner
23w-24s-(25f)†	Elements of Mineralogy..... (10 cred.; soph., jr., sr.; prereq., course in chem.)	(Winter) Lect. II Lab. III	WF WF	110P 100P	Mr. Gruner
	(For other sections, see Mines bulletin)				
	(Spring) Lect. II Rec. IX		MWF T		Mr. Gruner
	Sec. 1 Lab. VII, VIII VI, VII		M T		
	2 III, IV VII, VIII		M F		
(23w-24s)-25f†	Elements of Mineralogy..... (See 23w-24s-(25f))	Lect. III Rec. VIII	MWF F		Mr. Gruner
	Sec. 1 Lab. VI, VII VII, VIII VI, VII		MW T F		
27s§	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

* 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.

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

§ Does not count for a senior college course. Not open to sophomores under General Information, section 43 of Science, Literature, and the Arts bulletin, Part I.

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
61f	Blowpipe Analysis (3 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 Minnesota (4 cred.; jr., sr.; prereq., 2, 3, or 11)	Ar	Ar	Ar	Mr. Gruner, Mr. Thiel
91f-92w-93s	Index Fossils of North America.. (9 cred.; jr., sr.; prereq., 2, 3, or 11)				
	Lect.	I		F 105P	Mr. Stauffer
	Lab.	VI, VII		MW 105P	Mr. Stauffer
101f	Sedimentation (3 cred.; jr., sr., grad.; prereq., 23-24)	Ar		Ar	Mr. Allison
105f	Rock Study (3 cred.; jr., sr., grad.; prereq., 24)				
	Lect.	VJ		TTh 110P	Mr. Grout
	Sec. 1 Lab.	VII, VIII		T 200P	
	2	VII, VIII		Th 200P	
106w	Petrography (3 cred.; jr., sr., grad.; prereq., 105)			MF 200P	Mr. Grout
107f-108w-109s	Paleontologic Practice (9 cred.; jr., sr., grad.; prereq., 91-92-93)	Ar	Ar	105P	Mr. Stauffer
111f	Ore Deposits (3 cred.; sr., grad.; prereq., 2, 3, or 11, and 105)	I	TThS	110P	Mr. Emmons
112w	Geology of Petroleum..... (3 cred.; sr., grad.; prereq., 111)	I	TThS	110P	Mr. Emmons
113s	Prob. in Ore Deposits..... (3 cred.; sr., grad.; prereq., 112)	VI-IX	Th	104P	Mr. Emmons
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		TThS 200P	Mr. Grout
	Lab.	Ar		F 200P	
137w	Testing Econ. Minerals..... (3 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 105)				
	Lect.	VI		T 200P	Mr. Grout
	Lab.	VIII, IX		MW 200P	Mr. Thiel

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
140w-141s	Applied Petrography (6 cred.; jr., sr., grad.; prereq., 131)	Lect. II Lab. I, II		F 200P MW	Mr. Grout
144w-145s	Inter. of Geologic Maps..... (6 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 124)	VII-IX	TTh	104P	Mr. Allison
149s	Methods of Field Geology..... (1 cred.; jr., sr., grad.; to be taken with 150; prereq., 2, 23- 24-25, 106, 124-125)	Ar	Ar	Ar	Mr. Schwartz
150s	Field Geol. (Black Hills)..... (Cred. ar.; jr., sr., grad.; see members of department)	Ar	Ar	Ar	Mr. Emmons, Mr. Schwartz
151f-152w-153s	Adv. General Geology..... (9 cred.; jr., sr., grad.; prereq., 2, 3, or 11)	III	MWF	200aP	Mr. Stauffer
166w-167s	Mineralography (6 cred.; sr., grad.; prereq., 111, 131)	Ar	Ar	103P	Mr. Schwartz

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 Course 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.

No. if*	Title	Hour	Day	B'dg.	Instructor
	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	321F	Ar
	5	III	MTThFS	213F	Ar
	6	III	MTThFS	212F	Ar
	7	IV	MTWFS	207F	Ar
	8	IV	MTWFS	212F	Ar
	9	IV	MTWFS	209F	Ar
	10	VI	MTWThF	207F	Ar
	11	VI	MTWThF	209F	Ar
	12	VI	MTWThF	209½F	Ar
1w*	Beginning A (See 1f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	VII	MTWThF	207F	Ar
1s*	Beginning A (See 1f)				
	Sec. 1	II	MWThFS	212F	Ar
	2	VI	MTWThF	5F	Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 6, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
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	321F	Ar
	5	III	MTThFS	213F	Ar
	6	III	MTThFS	212F	Ar
	7	IV	MTWFS	207F	Ar
	8	IV	MTWFS	212F	Ar
	9	IV	MTWFS	209F	Ar
	10	VI	MTWThF	207F	Ar
	11	VI	MTWThF	209F	Ar
12	VI	MTWThF	209½F	Ar	
2s*	Beginning B				
	(See 2f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	} VII V	MTThF	207F	Ar
			W		
3f	Beginning C				
	(5 cred.; all; prereq., 2)				
	Sec. 1	III	MTThFS	209F	Ar
	2	VII	MTWThF	209F	Ar
3w	Beginning C				
	(See 3f)				
	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	321F	Ar
	5	III	MTThFS	213F	Ar
	6	III	MTThFS	212F	Ar
	7	IV	MTWFS	207F	Ar
	8	IV	MTWFS	212F	Ar
	9	IV	MTWFS	209F	Ar
	10	VI	MTWThF	207F	Ar
	11	VI	MTWThF	209F	Ar
12	VI	MTWThF	209½F	Ar	
4f	Rapid Reading				
	(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	

* Credit is usually not given for more than one beginning language. See paragraph 2, page 6, Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
4w	Rapid Reading				
	(See 4f)				
		Sec. 1	III	MTThFS 209F	Ar
		2	VII	MTWThF 209F	Ar
4s	Rapid Reading				
	(See 4f)				
		Sec. 1	II	MWThFS 207F	Ar
		2	} VII V	MTThF 209½F	Ar
				W	
7f	Prose and Poetry.....	III		MTThFS 207F	Ar
	(5 cred.; all; prereq., 2 yrs. prep. German)				
8w	Adv. Prose and Poetry.....	III		MTThFS 207F	Ar
	(5 cred.; all; prereq., 7)				
15f	Narr. Prose for Pre-Medics.....	I		MTWTh 212F	Ar
	(4 cred.; pre-med.; prereq., 2 yrs. prep. German)				
24f-25w-26s†	Begin. for Chemists.....	IV		MTWF 209½F	Ar
	(12 cred.; chemists, miners; no prereq.)				
27f	Narr. Prose for Chemists.....	II		MWF 209½F	Ar
	(3 cred.; chemists, miners; prereq., 26 or 2 yrs. prep. German)				
28w-29s†	Chemical German	II		MWF 209½F	Ar
	(6 cred.; chemists, miners; prereq., 27 or 4)				
31w-32s†	Medical German				
	(6 cred.; pre-med.; prereq., 4 or 15)				
		Sec. 1	I	MWF 212F	Ar
		2	I	MWF 109F	Ar
		3	I	TThS 212F	Ar
(31s)-32f†	Medical German	I		TThS 107F	Ar
	(See 31f-32w)				
31s-(32f)†	Medical German	I		MWF 217F	Ar
50f-51w-52s†	Composition	IV		TS 213F	Mr. Schlenker
	(6 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German)				
56f-57w†	Essay Writing	III		MWF 209½F	Mr. Kroesch
	(6 cred.; jr., sr.; prereq., 52)				
62w‡	Nineteenth-Century Prose	II		MWThFS 212F	Mr. Lussy
	(5 cred.; jr., sr.; prereq., 4 or 8, or 4 yrs. prep. German)				
62s‡	Nineteenth-Century Prose	III		MTThFS 209F	Ar
	(See 62w)				
63f‡	Modern Drama	IV		MWF 217F	Mr. Lussy
	(3 cred.; jr., sr.; prereq., 4 or 8)				
64w	Classic Drama	IV		MWF 217F	Mr. Lussy
	(3 cred.; jr., sr.; prereq., 62 or 63)				

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

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
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
100-101-102†	Middle High German..... (9 cred.; sr., grad.; prereq., 65 and 11 cred. above 60)	<i>Not offered in 1926-27</i>			
108s	Phonetics..... (3 cred.; sr., grad.; prereq., 9 senior college cred. in mod. lang.)	III	MWF	209½F	Mr. Kroesch
109f-110w-111s†	Hist. of German Language..... (9 cred.; sr., grad.; prereq., see statement under Comp. Phil.)	Ar	Ar	Ar	Mr. Klaeber
115f-116w-117s†	Middle High German Literature.. (9 cred.; sr., grad.; prereq., 65 and 11 cred. above 60)	VII, VIII, IX	W	314Lib	Mr. Kroesch
140-141-142†	Early New High German Literature, 1500-1700..... (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	<i>Not offered in 1926-27</i>			
150f-151w-152s†	Novelle..... (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	VII, VIII, IX	T	315Lib	Mr. Burkhard
153-154-155†	Studies in German Literature of the Nineteenth Century—Austrian Drama..... (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	<i>Not offered in 1926-27</i>			
160-161-162	Lyric Poetry..... (9 cred.; sr., grad.; prereq., 66 or 67 and 11 cred. above 60)	<i>Not offered in 1926-27</i>			
163f-164w-165s†	German and English Literary Relations, 16th, 17th, 18th centuries..... (9 cred.; sr., grad.; prereq., 65 or 67 and 11 cred. above 60)	VII, VIII, IX	M	301Lib	Mr. Davies
225f-226w-227s†	Lit. Problems (Drama of Fifteenth Century)..... (9 cred.; grad., sr. with completed major sequence)	VII, VIII, IX	Th	301Lib	Mr. Schlenker

GREEK

Major Adviser: Charles 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

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
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	Ar	Ar	112F	Mr. Savage
	(3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)				
52w	Oratory	Ar	Ar	112F	Mr. Savage
	(3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)				
53s	Dramatic Poetry	Ar	Ar	112F	Mr. Savage
	(3 cred.; jr., sr.; prereq., 51 or 52)				
105f	Lyric Poetry	Ar	Ar	112F	Mr. Savage
	(3 cred.; sr., grad.; prereq., 53)				
106w*	Advanced Drama	Ar	Ar	112F	Mr. Savage
	(3 cred.; sr., grad.; prereq., 53 or 105)				
107w*	Advanced Prose	Ar	Ar	112F	Mr. Savage
	(3 cred.; sr., grad.; prereq., 51, 52, or 51, 53, or 52, 53)				
108s‡	Advanced Epic Poetry	Ar	Ar	112F	Mr. Savage
	(3 cred.; sr., grad.; prereq., 105 or 106)				
109s‡	New Testament	Ar	Ar	112F	Mr. Savage
	(3 cred.; jr., sr., grad.; prereq., 51 and 52)				

Courses for Which No Knowledge of Greek Is Required

42s‡	Greek Sculpture	VII	TTh	114F	Mr. Savage
	(2 cred.; jr., sr.; no prereq.)				
43f‡‡	Greek Drama	VII	TTh	114F	Mr. Savage
	(2 cred.; jr., sr.; no prereq.)				
44w‡‡	Greek Literature and Life	VII	TTh	114F	Mr. Savage
	(2 cred.; jr., sr.; no prereq.)				
44s‡‡	Greek Literature and Life	I	WF	114F	Mr. Savage
	(See 44w)				
45f‡	Greek Mythology	I	WF	114F	Mr. Savage
	(2 cred.; jr., sr.; no prereq.)				
45w‡	Greek Mythology	I	WF	114F	Mr. Savage
	(See 45f)				

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.

* 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.

PROGRAM

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. if*	Title	Hour	Day	B'dg.	Instructor
	Modern World, 1648-1795..... (5 cred.; all; no prereq.)	Lect. II	TThS	OLAud	Mr. Ford, Mr. Harding
	Sec. 1	I	MW	311½F	
	2	I	MW	111OL	
	3	I	MW	305F	
	4	I	MW	306F	
	5	I	MW	303F	
	6	II	MW	109F	
	7	II	MW	311½F	
	8	II	MW	305F	
	9	II	MW	213F	
	10	II	MW	125F	
	11	II	MW	111OL	
	12	III	MW	114F	
	13	III	TTh	311F	
	14	III	TTh	311½F	
	15	V	MW	111OL	
	16	V	MW	112OL	
	17	VII	MW	221OL	
	18	VII	TTh	112OL	
	19	VIII	MW	305F	
	20	VIII	MW	112OL	
2w*	Modern World, 1795-1871..... (5 cred.; all; no prereq.)	Lect. II	TThS	OLAud	Mr. Ford, Mr. Harding
			Sections as in 1f		
3s	Modern World, 1871 to Present.. (5 cred.; all; prereq., 2)	Lect. II	TThS	OLAud	Mr. Ford, Mr. Harding
			Sections as in 1f		
4f-5w†	England, 1066 to Present..... (10 cred.; all; no prereq.)	Lect. VII	MW	OLAud	Mr. White
	Sec. 1	I	TThS	112OL	
	2 (pre-legal)	I	TThS	109F	
	3	II	TThS	209OL	
	4 (pre-legal)	II	TThS	107F	
	5	III	TThS	201F	
	6 (pre-legal)	III	TThS	305F	
	7 (pre-legal)	VI	TThF	110F	
	8	VII	TThF	6F	
	9	VII	TThF	113F	
	10 (pre-legal)	VII	TThF	15F	
4s-(5w)†	England, 1066 to Present..... (See 4f-5w)	III	MTThFS	211OL	Mr. White

* 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.

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
7f-8w†	American History (10 cred.; soph., jr., sr.; no prereq.)	Sec. 1 I 2 VII	TWThFS MTWThF	209OL 209OL	Mr. Shippee, Mr. Stephenson
9s	Recent American History (5 cred.; soph., jr., sr.; prereq., 10 cred. in hist. or pol. sci.)	Sec. 1 I 2 VII	TWThFS MTWThF	209OL 209OL	Mr. Shippee, Mr. Stephenson
11f-12w-13s†	Medieval History (10 cred.; 3d qtr. fr., soph., jr., sr.; prereq., 10 cred. except for mus. and int. dec.)	Lect. IV Sec. 1 IV (fall, winter) IV (spring) F and Ar 2 IV (fall, winter) IV (spring) S and Ar	MW F F and Ar S S and Ar	221OL 221OL 221OL 221OL 221OL	Miss Thompson
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
8o	<i>Introduction to Economic History</i> (3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ. or sociol.)	<i>Not offered in 1926-27</i>			
8r	<i>Introduction to Economic History</i> (3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ. or sociol.)	<i>Not offered in 1926-27</i>			
82f	Economic History of the United States: Colonial Period (3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ., pol. sci., or sociol.)	III	TThS	111OL	Mr. Gras
83w	Economic History of the United States: Early National Period (See 82)	III	TThS	111OL	Mr. Gras
84s	Economic History of the United States since 1860 (See 82)	III	TThS	111OL	Mr. Gras
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.)	<i>Not offered in 1926-27</i>			
103f	Pol. Hist.: Greece (5 cred.; jr., sr., grad.; prereq., 20 cred. or major in Greek or Latin)	IV	MTWFS	112OL	

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
104S	Near East: Modern..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	IV	MTWFS	112OL	
105W	History of Rome..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	IV	MTWFS	112OL	
106f-107w-108s§	Europe, 1815-1914 (9 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	VII	MWF	111OL	Mr. Steefel
109S	Modern England (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	IV	MTWFS	111OL	Mr. Harding
111W	European Background of American Immigration (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VI	TWThF	111OL	Mr. Stephenson
112S	American Immigration (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VI	TWThF	111OL	Mr. Stephenson
113f-114w-115S	Econ. Hist. of Europe since 1750 (9 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	II	TThS	111OL	Mr. Gras
116-117-118	<i>Econ. Hist. of Europe, 1300-1750</i> (9 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	<i>Not offered in 1926-27</i>			
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
123S	Introduction to the History of Russia (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Hist. 1-2 or 16)	II	MWF	303F	Mr. Steefel
124f	European Expansion (3 cred.; jr., sr., grad.; prereq., 20 cred. in hist. incl. 1-2, or 106-107-108)	II	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
127W	Feudal Institutions (5 cred.; jr., sr., grad.; prereq., 15 cred.)	III	MTThFS	112OL	Mr. Krey

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

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
128	<i>Rise of Nationalism in Europe...</i> (5 cred.; jr., sr., grad.; prereq., 15 cred.)	<i>Not offered in 1926-27</i>			
131f-132w	France under Louis XIV and Louis XV	I	TThS	111OL	Mr. Harding
	(6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 in soc. sci. incl. 10 in hist.)				
133s	Near East: Old Orient.....	Ar	Ar	Ar	
	(3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)				
134s	Ancient Civilization: Greece.....	Ar	Ar	Ar	
	(3 cred.; jr., sr., grad.; prereq., 20 cred. incl. 103 or equiv. or major in Greek or Latin and consent of instr.)				
135s	Ancient Civilization: Rome.....	Ar	Ar	Ar	
	(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.)				
136f-137w	Far Eastern Government and Politics	See Political Science program			
138-139†	<i>Far Eastern Diplomacy.....</i>	<i>Not offered in 1926-27</i>			
141	<i>West in Amer. Hist. to 1815....</i> (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. incl. 7-8)	<i>Not offered in 1926-27</i>			
142	<i>West. in Amer. Hist. 1815-1865..</i> (3 cred.; jr., sr., grad.; prereq., see 141)	<i>Not offered in 1926-27</i>			
143w	American Political Parties.....	II	MWF	221OL	Mr. Stephenson
	(3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. incl. 7-8 or equiv.)				
144f-145w†	History of Minnesota.....	II	TThS	221OL	Mr. Buck
	(6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 7-8 or consent of instr.)				
146-147†	<i>Constitutional Hist. of U. S.</i> (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 10 cred. in hist. and 10 in soc. sci. incl. Pol. Sci. 1)	<i>Not offered in 1926-27</i>			
148f-149w†	English Colonies in America.....	I	MWF	112OL	Mr. Harding
	(6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 in hist., or 15 cred. in hist.)				
152	<i>Select Topics, West to 1815....</i> (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8 or equiv.)	<i>Not offered in 1926-27</i>			
153	<i>Topics, West since 1865.....</i> (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)	<i>Not offered in 1926-27</i>			

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

PROGRAM

No.	Title	Hour	Day	B'ldg.	Instructor
154s	Topics, Minnesota (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)	VIII, IX	TTh	328Lib	Mr. Buck
155	<i>United States, 1850-1865</i> (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)	<i>Not offered in 1926-27</i>			
156f	U. S. Reconstruction..... (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)	VIII, IX	WF	328Lib	Mr. Shippee
157f-158w	Topics, Nineteenth Century..... (10 cred.; sr., grad.; prereq., 20 cred. incl. 106-107-108, 101-102, or 129-130; equiv. of Hist. 2-3 and French or German)	VIII, IX	TTh	339Lib	Mr. Steefel
162f	Beginnings of Parliament..... (5 cred.; sr., grad.; prereq., 20 cred., knowledge of high school Latin)	VIII, IX	TTh	328Lib	Mr. White
164w	Studies in Crusades..... (5 cred.; sr., grad.; prereq., 20 cred., knowledge of high school Latin)	VIII, IX	TTh	Ar	Mr. Krey
166f	Topics, Hist. of Immigration..... (5 cred.; sr., grad.; prereq., 20 cred., consent of instr.)	VIII, IX	TTh	Ar	Mr. Stephenson
168s	Topics, American Foreign Relations (3 cred.; sr., grad.; prereq., 20 cred. in hist. incl. 9, or 20 cred. in pol. sci.)	IX, X	TTh		Mr. Shippee
169	<i>Econ. Hist. of U. S. since 1865</i> .. (3 cred.; sr., grad.; prereq., 20 cred. in hist. or econ.)	<i>Not offered in 1926-27</i>			
183s	Stuart Period (5 cred.; sr., grad.; prereq., 20 cred. incl. 4-5)	VIII, IX	MW	328Lib	Mr. Willson

HOME ECONOMICS

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

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

Junior College Courses

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

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	B'dg.	Instructor
11f,s	Garment Making				
	(3 cred.; all; no prereq.)				
	Sec. 1	I, II	MWF	304HE	Miss Gorham, Miss Sell
	(Limited to 24 each)	2	TThS	304HE	Miss Gorham, Miss Sell
		3	VI, VII, VIII	TTh 304HE	Miss Gorham, Miss Eppel
11w	Garment Making				
	(See 11f)				
	Sec. 1	I, II	TThS	304HE	Miss Gorham
		2	VI, VII, VIII	TTh 304HE	Miss Gorham
13f,s	Dressmaking				
	(5 cred.; all; prereq., 3, 11, 50, 51, home pract. in garment mak- ing)				
	I, II	MTWThF	305HE(f)	Miss Gorham	
	(Limited to 24 students)	III, IV	MTWFS	114HE(s) 304HE	Miss Little
21f	Foods and Cookery.....	I, II	MTWThF	209HE	Miss Olson
	(5 cred.; soph., jr., sr.; prereq., organ. chem.*)				
21w,s	Foods and Cookery.....				
	(See 21f)				
	Sec. 1	VI, VII	MTWThF	209HE	Miss Olson
	(Limited to 20 each)	2	III	MTWFS	209HE
22f,w	Food Economics	III, IV	MTWFS	203,207HE	Miss Kolshorn
	(5 cred.; soph., jr., sr.; prereq., 21 or 26)				
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 Child, Miss Kolshorn
50f	Color and Design I.....				
	(3 cred.; no prereq.)				
	Sec. 1	I-II	MWF	401HE	
		2	I-II	TThS	401HE
50w	Color and Design I.....				
	(See 50f)				
	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	TThS	112HE
					Miss L. Stoddard
52f	Art History and Appreciation....				
	(3 cred.; 3d qtr. soph., jr., sr.; prereq., 50, 51)				
	Sec. 1	VIII	MWF	313HE	Miss V. Goldstein
		2	III	TThS	313HE
52w	Art History and Appreciation....	VIII	MWF	313HE	Miss V. Goldstein
	(See 52f)				
52s	Art History and Appreciation....				
	(See 52f)				
	Sec. 1	II	MWF	313HE	Miss V. Goldstein
		2	VIII	MWF	313HE
					Miss V. Goldstein

* Course 21 may be taken parallel with 4.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
53f	Advanced Design (3 cred.; soph., jr., sr.; prereq., 50-51 or 56)	Sec. 1 III, IV 2 VI, VII	MWF	402HE	Miss H. Goldstein
53w	Advanced Design (See 53f)	Sec. 1 VI, VII 2 VI, VII, VIII	MWF	402HE	Miss H. Goldstein
53s	(Limited to 20) Advanced Design (See 53f)	Sec. 1 VI, VII 2 VI, VII, VIII	MWF	402HE	Miss V. Goldstein
56f	Application of Color and Design.. (3 cred.; no prereq.)	Sec. 1 III, IV 2 VI, VII	MWF	402HE	Miss V. Goldstein
70f	Food Preparation (3 cred.; †; prereq., 10 cred in a laboratory science) (Limited to 20)	VI, VII	MWF	299HE	Miss Osbeck

Senior College Courses

17f,w	Advanced Clothing Construction.. (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 24)	III, IV	MWF	305HE	Miss C. Brown, Miss Gorham
17s	Advanced Clothing Construction.. (See 17f,w)	Sec. 1 III, IV 2 I, II	MWF	305HE	Miss C. Brown, Miss Gorham
71w	Elementary Dietetics (3 cred.; jr., sr.‡; prereq., 70)	VI, VII	TThS	305HE	Miss Gorham
72s	Special Problems in Home Man- agement (3 cred.; jr., sr.‡; prereq., H. E. 71, Econ. 6-7 prereq. or parallel)	VI	MWF	103,106HE	Miss Osbeck
123f,w	Clothing Economics (2 cred.; jr., sr.; prereq., 13, Econ. 6-7)	III	TTh	203,313HE	Miss Weller
131f	Home Management: House Plan- ning and Equipment..... (5 cred.; sr.; prereq., 52, 53) (Limited to 20)	III, IV	MTWFS	401HE	Miss Morse
131w	Home Management: House Plan- ning and Equipment..... (See 131f)	Sec. 1 VI, VII	MTWThF	401HE	Miss Morse
131s	Home Management: House Plan- ning and Equipment..... (See 131f)	Sec. 1 I, II 2 VI, VII	MTWThF	401HE	Miss Morse

‡ Open to sophomores only in their third quarter. 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: Professors Scott and McClendon

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

For other courses see Medical School bulletin and programs.

JOURNALISM

The program of courses in Journalism for the year 1926-27 will be published later.

* Students may register for lectures without laboratory.

LATIN

REQUIREMENTS OF THE DEPARTMENT

Major Adviser: J. B. Pike

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	B'dg.	Instructor
1f-2w†§	Beginning Latin (10 cred.; all; no prereq.)				
	Sec. 1	IV	MTWFS	109F	Mrs. Babcock
	2	VI	MTWThF	109F	Miss Lundstrom
3s	Caesar (5 cred.; all; prereq., 1-2 or 1 yr. Latin)				
	Sec. 1	IV	MTWFS	109F	
	2	VI	MTWThF	109F	Miss Lundstrom
11f	Virgil I and II..... (5 cred.; all; prereq., 1-2, 3, or 2 yrs. Latin)				
	Sec. 1	III	MTThFS	109F	Mrs. Babcock
	2	VI	MTWThF	107F	Mrs. Babcock
	3	VII	MTWThF	110F	Miss Lundstrom
12w	Virgil III and IV..... (5 cred.; all; prereq., 1-2, 3, or 2 yrs. Latin)				
	Sec. 1	III	MTThFS	109F	Mrs. Babcock
	2	VI	MTWThF	107F	Mrs. Babcock
	3	VII	MTWThF	110F	Miss Lundstrom
13s	Ovid (5 cred.; all; prereq., 1-2, 3, or 2 yrs. Latin)	III	MTThFS	109F	Mrs. Babcock
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	Mrs. Babcock

Senior College Courses

51f	Pliny's Letters (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	III	MWF	107F	Mr. Pike
52	Horace's Satires and Epistles.... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	<i>Not offered in 1926-27</i>			

† 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 6 of Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
53	<i>Suetonius, Selected Lives</i> (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	Not offered in 1926-27			
62w	Horace's Odes and Epodes..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	III	MWF	107F	Mr. Pike
63	<i>Apuleius</i> (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	Not offered in 1926-27			
71	<i>Cicero's De Amicitia and De Senectute</i> (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	Not offered in 1926-27			
73s	Advanced Grammar and Composition* (3 cred.; jr., sr.; prereq., 51 and 52, or 71 and 62)	III	MWF	107F	Mr. Pike
121	<i>Advanced Virgil</i> (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	Not offered in 1926-27			
122w	Cicero's Letters (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
123s	Medieval Latin (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
131f	Juvenal (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
132	<i>Seneca's Epistles</i> (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	Not offered in 1926-27			
133	<i>Vulgar Latin</i> (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	Not offered in 1926-27			
201-202-203	<i>Graduate Seminar: Tacitus</i> (9 cred.)	Not offered in 1926-27			
211f-212w-213s	<i>Graduate Seminar: Lucretius</i> (9 cred.)	VIII-IX	F	112Lib	Mr. Pike
221-222-223	<i>Graduate Seminar: Cicero's Phil. Works</i> (9 cred.)	Not offered in 1926-27			
231f-232w-233s	<i>Graduate Seminar</i>	Ar	Ar	Ar	Mr. Pike
<i>Courses for Which No Knowledge of Latin Is Required</i>					
43‡	<i>Roman Literature</i> (3 cred.; jr., sr.‡; no prereq.)	Not offered in 1926-27			

* Required of students who expect a teaching recommendation.

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

LIBRARY METHODS

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

MATHEMATICS

REQUIREMENTS OF THE DEPARTMENT

Major Adviser: A. L. Underhill

For a teacher's certificate.—Major recommendation: 8 credits 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

No.	Title	Hour	Day	Bldg.	Instructor
3f	Higher Algebra (pre-med. students only) (4 cred.; pre-med. only; prereq., 1 yr. elem. alg.)	VII	MTThF	105F	Ar
3w	Higher Algebra (pre-med. students only) (See 3f)	VII	MTThF	104F	Ar
4f	Algebra and Trigonometry (pre-med. students only)..... (4 cred.; pre-med. only; prereq., 3 or 5, or prep. higher alg.)	VIII	MTThF	105F	Ar
4w	Algebra and Trigonometry (pre-med. students only)..... (See 4f)	VII	MTThF	105F	Ar
4s	Algebra and Trigonometry (pre-med. students only)..... (See 4f)	VII	MTThF	104F	Ar
5f	Higher Algebra (5 cred.; all; prereq., 1 yr. elem. alg.)	Sec. 1 II 2 VI	MWThFS	105F	Ar
5w	Higher Algebra (See 5f)	Sec. 1 I 2 VI	TWThFS	104F	Ar
			MTWThF	105F	Ar

* 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 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	B'dg.	Instructor
5s	Higher Algebra	I	TWThFS	102F	Ar
	(See 5f)				
6f¶	Trigonometry	IV	MTWFS	104F	Mr. Brink
	(5 cred.; all; prereq., 5 or prep. higher algebra)				
6w¶	Trigonometry	VI	MTWThF	104F	Ar
	(See 6f)				
6s¶	Trigonometry	I	TWThFS	104F	Ar
	(See 6f)				
7f¶	College Algebra	IV	MTWFS	105F	Mr. Hart
	(5 cred.; all; prereq., 6)				
7w¶	College Algebra	IV	MTWFS	104F	Mr. Brink
	(See 7f)				
7s¶	College Algebra	VI	MTWThF	104F	Ar
	(See 7f)				
8f¶	Commerce Algebra	I	TWThFS	104F	Ar
	(5 cred.; pre-bus. students; prereq., 5 or prep. high. alg.)				
8w¶	Commerce Algebra	II	MWThFS	105F	Ar
	(See 8f)				
8s¶	Commerce Algebra	VI	MTWThF	105F	Ar
	(See 8f)				
20f	Mathematics of Investment.....	VI	MTWThF	105F	Mr. Hart
	(5 cred.; all; prereq., 8, or 6 and 7)				
20w	Mathematics of Investment.....	I	TWThFS	105F	Mr. Hart
	(See 20f)				
20s	Mathematics of Investment.....	II	MWThFS	105F	Mr. Hart
	(See 20f)				
30f	Analytical Geometry	III	MTThFS	104F	Mr. Brink
	(5 cred.; all; prereq., 6 and 7)				
30w	Analytical Geometry	IV	MTWFS	105F	Mr. Underhill
	(See 30f)				
30s	Analytical Geometry	IV	MTWFS	104F	Mr. Brink
	(See 30f)				

Senior College Courses

50f§	Calculus I	III	MTThFS	105F	Mr. Jackson
	(5 cred.; jr., sr.; prereq., 30)				
50w§	Calculus I	III	MTThFS	104F	Ar
	(See 50f)				
50s§	Calculus I	IV	MTWFS	105F	Ar
	(See 50f)				
51w§	Calculus II	III	MTThFS	105F	Mr. Jackson
	(5 cred.; jr., sr.; prereq., 50)				
51s§	Calculus II	III	MTThFS	104F	Ar
	(See 51w)				
52f§	Calculus III	II	MWThFS	101F	Mr. Underhill
	(5 cred.; jr., sr.; prereq., 51)				
52s§	Calculus III	III	MTThFS	105F	Mr. Jackson
	(See 52f)				

¶ 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 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.

§ 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.

No.	Title	Hour	Day	Bldg.	Instructor
60s	Synthetic Metric Geometry..... (3 cred.; jr., sr.; prereq., 50)	I	MWF	108F	Miss Gibbens
62w-63s	Theory of Equations..... (6 cred.; jr., sr.; prereq., 50)	VII	MWF	101F	Mr. Bussey
70	<i>Hist. of Elem. Math.</i> (3 cred.; jr., sr.; prereq., 30)	<i>Not offered in 1926-27</i>			
71	<i>Solid Analytical Geometry</i> (3 cred.; jr., sr.; prereq., 50)	<i>Not offered in 1926-27</i>			
102f-103w-104s	Adv. Analytic and Synthetic Geometry..... (9 cred.; jr., sr., grad.; prereq., 50)	Ar	Ar	Ar	Miss Gibbens
106f	Differential Equations..... (3 cred.; jr., sr., grad.; prereq., 51)	III	MWF	108F	Mr. Underhill
107w-108s	Advanced Calculus..... (6 cred.; jr., sr., grad.; prereq., 52)	III	MWF	108F	Mr. Hart
115-116-117	<i>Differential Geometry</i> (9 cred.; jr., sr., grad.; prereq., 50-51)	<i>Not offered in 1926-27</i>			
118-119-120	<i>Vector Analysis</i> (9 cred.; jr., sr., grad.; prereq., 50-51)	<i>Not offered in 1926-27</i>			
121f-122w-123s	Math. Theory of Statistics..... (9 cred.; jr., sr., grad.; prereq., 50-51)	Ar	Ar	Ar	Mr. Jackson
140w‡	Method of Least Squares..... (3 cred.; jr., sr., grad.; prereq., Math. 51)	See Astronomy program			
206f-207w-208s	Theory of Functions..... (9 cred.; sr., grad.; prereq., 106, 107-108)	Ar	Ar	Ar	Mr. Brink

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

MECHANICAL ENGINEERING

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
M.E.11f,w,s	Elementary Shop Practice..... (2 cred. per qtr.; § no prereq.)	Ar	MW*	ME	Mr. Shipley and others
M.E.12f,w,s	Elem. Shop Practice (Foundry).. (2 cred. per qtr.; § no prereq.)	Ar	MW*	ME	Mr. Shipley and others
M.E.13f,w,s	Elem. Shop Practice (Forge)..... (2 cred. per qtr.; § no prereq.)	Ar	MF*	ME	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	VI	MWF	A	Ar
	4	VIII	MWF	A	Ar

‡ Identical with Astronomy 140.

* Other hours and days are available for students who have program conflicts. Students interested should consult Professor Shipley in the College of Engineering.

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

No.	Title	Hour	Day	Bldg.	Instructor
3s	First Year Basic Course..... (No cred.; fr.; prereq., 1-2)	VII, VIII, IX	T or W	A	Ar
4f-5w	Second Year Basic Course..... (No cred.; soph.; prereq., 1-2, 3)				
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	VI	MWF	A	Ar
	4	VIII	MWF	A	Ar
6s	Second Year Basic Course..... (No cred.; soph.; prereq., 4-5)	VII, VIII, IX	T or W	A	Ar
51f-52w	First Year Advanced Course.... (Total of five hours selected from the following)	II	MWF	A	Ar
		III	MWF	A	Ar
		VI	MWF	A	Ar
	(Cred.; † jr.; prereq., 4-5, 6)	VIII	MWF	A	Ar
		I, II	TThS	A	Ar
		III, IV	TS	A	Ar
		VI, VII	TTh	A	Ar
		VIII, IX	TTh	A	Ar
53s	First Year Advanced Course..... (Cred.; † jr.; prereq., 51-52)	VII, VIII, IX	T or W	A	Ar
		IV	TS	A	Ar
54f-55w	Second Year Advanced Course... (Total of five hours selected from the following)	II	MWF	A	Ar
		III	MWF	A	Ar
		VI	MWF	A	Ar
	(Cred.; † sr.; prereq., 51-52, 53)	VIII	MWF	A	Ar
		I, II	TThS	A	Ar
		III, IV	TS	A	Ar
		VI, VII	TTh	A	Ar
		VIII, IX	TTh	A	Ar
56s	Second Year Advanced Course... (Cred.; † sr.; prereq., 54-55)	VII, VIII, IX	T or W	A	Ar
		IV	TS	A	Ar

MUSIC

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

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	III	MWF	Mu	Miss Reeves
	(See 1f-2w-3s)				
4f-5w-6s†	Counterpoint	III	TTh	Mu	Mr. Ferguson
	(6 cred.; soph. mu.; prereq., 1-2-3)				
7f-8w-9s†	Ear Training	VI	TTh	Mu	Ar
	(Cred.; * fr., soph. mu.; no pre- req.)				
7w-8s†	Ear Training	VII	TTh	Mu	Ar
	(See 7f-8w-9s)				
10f-11w-12s	First Year Organ.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; fr. mu.)				

* Course 7f-8w-9s carries 3 credits for freshmen; none for sophomores.

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

‡ For the amount of credit given for the work of the Advanced R.O.T.C., see pages 13 and 14, Science, Literature, and the Arts bulletin, Part II.

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
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 String Section (3 cred.; jr. sr.)	7:30 p.m. IX	W T	Mu Mu	Mr. Pepinsky Ar
43f-44w-45s	University Chorus‡ (3 cred.; fr. and soph. mu., acad. jr., sr.)	7 p.m.	T	Mu	Mr. Killcen
50f-51w-52s	Third Year Organ..... (6 or 12 cred.; jr.; prereq., 13-14- 15)	Ar	Ar	Mu	Ar
53f-54w-55s	Fourth Year Organ..... (6 or 12 cred.; sr.; prereq., 50-51- 52)	Ar	Ar	Mu	Ar
56f-57w-58s	Third Year Piano..... (6 or 12 cred.; jr.; prereq., 19- 20-21)	Ar	Ar	Mu	Ar
59f-60w-61s	Fourth Year Piano..... (6 or 12 cred.; sr.; prereq., 56- 57-58)	Ar	Ar	Mu	Ar
62f-63w-64s	Third Year Violin..... (6 or 12 cred.; jr.; prereq., 25- 26-27)	Ar	Ar	Mu	Ar
65f-66w-67s	Fourth Year Violin..... (6 or 12 cred.; sr.; prereq., 62- 63-64)	Ar	Ar	Mu	Ar
68f-69w-70s	Third Year Vocal Training..... (6 or 12 cred.; jr.; prereq., 31- 32-33)	Ar	Ar	Mu	Ar
71f-72w-73s	Fourth Year Vocal Training..... (6 or 12 cred.; sr.; prereq., 68- 69-70)	Ar	Ar	Mu	Ar

‡ Does not carry credit for academic freshmen and sophomores.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
74f-75w-76s	Third Year of Other Orchestral Instruments (6 or 12 cred.; jr.; prereq., 37-38-39)	Ar	Ar	Mu	Ar
77f-78w-79s	Fourth Year of Other Orchestral Instruments (6 or 12 cred.; sr.; prereq., 74-75-76)	Ar	Ar	Mu	Ar
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
92f-93w-94s	Principles of Vocal Technique.... (3 cred.; all; no prereq.)	III	W	Mu	Mr. Killeen
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, 4-5-6)	II	MWF	Mu	Mr. Ferguson
109f-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 (For voice students) 2 VII	TTh	Mu	Mr. Pepinsky Miss Hull
115f-116w-117s	Advanced Ensemble (6 cred.; sr.; prereq., 112-113-114)	Sec. 1 IV (For voice students) 2 VI	MW	Mu	Mr. Pepinsky Mrs. Richter
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
127f-128w-129s	Advanced Composition (9 cred.; sr.; prereq., 4-5-6)	Ar	Ar	Mu	Mr. Ferguson

ORIENTATION

No.	Title	Hour	Day	B'dg.	Instructor
1f-2w†	Orientation (10 cred.; entering freshmen only; no prereq.)	III VI	MTThFS MTWThF	301F 301F	
1w-2s†	Orientation (See 1f-2w)	III	MTThF	209OL	

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

‡ Does not carry credit for academic freshmen and sophomores.

PHILOSOPHY

Major Adviser: D. F. Swenson

No.	Title	Hour	Day	Bldg.	Instructor
1f	Problems of Philosophy..... (5 cred.; soph., jr., sr.; no pre-req.)	Sec. 1	I	TWThFS 125F	Mr. Dubs
		2	II	MWThFS 321F	Ar
		3	VII	MTWThF 322F	Mr. Dubs
1w	Problems of Philosophy..... (See 1f)	Sec. 1	III	MTThFS 321F	Mr. Swenson
		2	VII	MTWThF 322F	Mr. Dubs
1s	Problems of Philosophy..... (See 1f)	Sec. 1	IV	MTWFS 321F	Mr. Dubs
		2	VI	MTWThF 321F	Ar
2f	Logic (5 cred.; soph., jr., sr.; no pre-req.)	Sec. 1	III	MTThFS 321F	Mr. Swenson
		2	IV	MTWFS 321F	Ar
2w	Logic (See 2f)	Sec. 1	IV	MTWFS 321F	Mr. Dubs
		2	VII	MTWThF 321F	Ar
2s	Logic (See 2f)	Sec. 1	II	MWThFS 321F	Ar
		2	III	MTThFS 321F	Mr. Swenson
		3	VII	MTWThF 321F	Mr. Dubs
3f	Ethics (5 cred.; soph., jr., sr.; no pre-req.)	4	IV	MTWFS 322F	Ar
3w	Ethics (See 3f)		I	TWThFS 107F	Ar
3s	Ethics (See 3f)		I	TWThFS 322F	Mr. Wilde
10	Science and Religion..... (2 cred.; soph., jr., sr.; prereq., 10 cred. in phil. or a science)			<i>Not offered in 1926-27</i>	
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. Dubs
101w	Psychology of Religion..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)		II	TThS 322F	Mr. Dubs
102s	Philosophy of Religion..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)		II	TThS 322F	Mr. Swenson

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
103	<i>Esthetics</i> (3 cred.; jr., sr., grad.; prereq., 10 cred.)				Not offered in 1926-27
1045	History of Esthetic Theory..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	MWF	322F	Mr. Swenson
108-109	<i>History of Ethics</i> (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)				Not offered in 1926-27
120	<i>Scandinavian Philosophy</i> (3 cred.; jr., sr., grad.; prereq., 10 cred.)				Not offered in 1926-27

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 Quiz II	MWF Th	30Ph 305E	Mr. Erikson
		or IX	Th	100C	
3w	Elem of Mechanics and Sound.. (See 3f)	Lect. VIII Quiz IX	MWF F	30Ph 30Ph	Mr. Erikson
3s	Elem. of Mechanics and Sound.. (See 3f)	Lect. III Quiz IX*	TThS F	30Ph 305E	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. Erikson and assistants
9s‡	Acoustics (3 cred.; all; no prereq.)	VIII	MWF	30Ph	Mr. Buchta
23f	Heat (3 cred.; all; prereq., 3)	Lect. III Quiz IX	TThS Th	30Ph 100C	Mr. Miller Mr. Miller

* Students who take Inorganic Chemistry 105 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.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
23w	Heat (For schedule of hours, see	Physics 23w,	Engineering program)		
24f	Heat Laboratory				
	(1 cred.; all; prereq., 4, 23, or reg. in 23)				
	Sec. 1	VI, VII	M	23Ph	Mr. Miller and assistants
	2	VIII, IX	M	23Ph	
	3	VI, VII	T	23Ph	
	4	VIII, IX	T	23Ph	
24w	Heat Laboratory				
	(See 24f)				
	Sec. 1	VI, VII	T	23Ph	Mr. Miller and assistants
	2	VIII, IX	T	23Ph	
	3	I, II	Th	23Ph	
	4	VIII, IX	Th	23Ph	
33f,s	Optics				
	(3 cred.; all; prereq., 3)				
	Lect.	I	TThS	30Ph	Mr. Valasek Mr. Valasek
	Quiz	IX	F	30Ph	
34f,s	Optics Laboratory				
	(1 cred.; all; prereq., 4 and 33 or 35 or reg. in 33 or 35)				
	Sec. 1	VI, VII	Th	23Ph	Mr. Valasek Mr. Valasek
	2	VI, VII	F	23Ph	
35w	Optics				
	(2 cred.; all; prereq., 3)				
	Lect.	VI	TTh	30Ph	Mr. Valasek
	Quiz	IX (winter)	T	30Ph	
		VIII (spring)	Th	30Ph	
43w	Electricity				
	(3 cred.; all; prereq., 3)				
	Lect.	III	TThS	30Ph	Mr. Zeleny Mr. Zeleny
	Quiz	IX	Th	100C	
43s	Electricity (For schedule of hours, see Physics 43s, Engineering program)				
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 Mr. Buchta
	2	VI, VII, VIII	TTh	2Ph	
101f-103w-105s	Theoretical Physics	IV	MTWFS	2Ph	Mr. Tate
	(13 cred.; jr., sr., grad.; prereq., 12 cred. in phys., Math. 51)				

No.	Title	Hour	Day	Bldg.	Instructor
104w	Precision Mechanics (3 cred.; jr., sr., grad.; prereq., 12 cred. and Math. 51)				
	Sec. 1	VI, VII, VIII	MW	2Ph	Mr. Buchta
	2	VI, VII, VIII	TTh	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)	VI-IX	MW	23Ph	Mr. Miller
134f,s	Applied Optics (3 cred.; jr., sr., grad.; prereq., 33 and 34)	Ar	Ar	3Ph	Mr. Valasek
144f	Elect. Measurements (3 cred.; jr., sr., grad.; prereq., 43 and 44)	See 144f,	Engineering program		Mr. Zeleny
146w	Elect. Meas. and Precision..... (3 cred.; by permission from in- structor; prereq., 144)	Ar	Ar	12Ph	Mr. Zeleny
148w	Radioactivity (3 cred.; jr., sr., grad.; prereq., 43, 44)	Ar	Ar	13Ph	Mr. Erikson
150s	Conduction through Gases..... (3 cred.; jr., sr., grad.; prereq., 144)	Ar	Ar	Ar	Mr. Erikson

POLITICAL SCIENCE

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.

PROGRAM

Introductory Courses

No.	Title	Hour	Day	B'dg.	Instructor	
1f,w,s	American Government (5 cred.; soph., jr., sr., and fr. with 10 cred. in hist. or econ.; no prereq.)	Lect.	IV	WF	OLAud	Mr. Young
		Sec. 1	I	TThS	114F (fall, spring) 125F (spring)	
		2	III	TThS	221OL (fall, winter) 15F (spring)	
		3	VI	MWF	111OL (fall) 321F (winter) 112OL (spring)	
		4	VII	MWF	112OL	
2f,w,s	State Government (5 cred.; soph., jr., sr.; prereq., 1)	Lect.	VI	MWF	211OL	Mr. Lambie
		Sec. 1	VI	TTh	211OL	
		2	VII	TTh	111OL	
		3	Ar	Ar	Ar	
3f,w,s	Comparative European Govern- ment (5 cred.; soph., jr., sr.; prereq., 1)	Lect.	IV	MWF	211OL	Mr. Gaus, Mr. Harrison
		Sec. 1	III	TTh	302F	
		2	IV	TS	5F	
11f,w,s	Municipal Government (5 cred.; soph., jr., sr.; prereq., 1)	Lect.	I	TThS	211OL	Mr. Anderson
		Sec. 1	I	WF	211OL	
		2	I	WF	6F	
15f,w,s	Introduction to Political Science.. (5 cred.; soph., jr., sr.; prereq., 1)	Lect.	III	WF	6F	Mr. Hall
		Sec. 1	III	MWF	111OL	
		2	III	TTh	6F	
25f,w,s	World Politics (5 cred.; soph., jr., sr.; prereq., 1 or 10 cred. in hist.)	Lect.	VI	MTW	209OL	Mr. Quigley
		Sec. 1	VI	ThF	209OL	
		2	VII	ThF	221OL	
		3	III	ThS	15F (fall) 3F (winter, spring)	

Advanced Courses

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	WF	OLAud	Mr. Young
		Sec. 1	I	M	110F	
		2	II	M	110F	
		3	IV	M	Ar	
		4	VI	M	217F (fall) 111OL (winter, spring)	
		5	I	T	204B (fall, winter) 217F (spring)	
		6	II	T	217F	
		7	III	T	316F	
		8	IV	T	201F	

* Cannot be counted for a minor sequence.

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

No.	Title	Hour	Day	Bldg.	Instructor
102S	Political Parties (3 cred.; jr., sr., grad.; prereq., 15 cred.)	VI	MWF	110F	Mr. Gaus
105S	Colonization (3 cred.; jr., sr., grad.; prereq., 15 cred. or 20 cred. in soc. sci.)	I	MWF	221OL	Mr. Harrison
111W-112S†	Municipal Powers and Functions (6 cred.; jr., sr., grad.; prereq., 18 cred. incl. 11)	III	TThS	201F (spring) 211OL (winter)	Mr. Anderson
113	<i>Municipal Problems</i> (3 cred.; jr., sr., grad.; prereq., 18 cred. incl. 11)	<i>Not offered in 1926-27</i>			
121f-122W†	International Law (6 cred.; sr., grad.; prereq., 20 cred. in soc. sci.)	IV	MWF	209OL	Mr. Allin
123S	International Organization (3 cred.; sr., grad.; prereq., same as for 121-122)	IV	MWF	209OL	Mr. Quigley
124	<i>Problems of International Law...</i> (3 cred.; sr., grad.; prereq., 121- 122)	<i>Not offered in 1926-27</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 1926-27</i>			
130f	Introduction to Administration... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.)	II	MWF	209OL	Mr. Gaus
131W-132S†	Principles of Public Administra- tion (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	II	MWF	209OL	Mr. Lambie
136f-137W†	Far Eastern Government and Poli- tics (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	VII	MWF	114F	Mr. Quigley
138-139†	<i>Far Eastern Diplomacy.....</i> (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Course 25, or 10 cred. in pol. sci. and Hist. 1-2 or 2-3)	<i>Not offered in 1926-27</i>			
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

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

No.	Title	Hour	Day	Bldg.	Instructor
151w-152s†	Constitutional Law (6 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1 sr. college course)	VI	MWF	221OL	Mr. Kumm
155s	Administrative Law (3 cred.; jr., sr., grad.; prereq., 15 cred.)	I	TThS	221OL	Mr. Kumm
157f	Police Power (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. in pol. sci. or Econ. 155)	I	TThS	221OL	Mr. Kumm
161s	Comparative Federal Government (3 cred.; sr., grad.; prereq., 20 cred.)	II	TThS	209OL	Mr. Allin
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
181w	Modern Political Thought..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	TWThFS	322F	Ar
187w	Problems of Democracy..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	VI	MWF	205F	Mr. Gaus
190	Jurisprudence (2 cred.; grad. and sr. of suitable preparation)	*		*	Mr. Rott- schaefer

PREVENTIVE MEDICINE AND PUBLIC HEALTH

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	B'dg.	Instructor
2f	First Aid (1 cred.; no prereq.) (Limited to 20 women)	VI, VII	F	§	Miss Fisher
2w	First Aid (See 2f) (Limited to 20 women)	VI, VII	F	§	Miss Fisher
3f,w,s‡	Personal Hygiene and Elementary Sanitation (2 cred.; fr., soph.; no prereq.) (Limited to 80 men)	IV	TS	101bMH	Dr. Lees, Dr. Cady
5of,w	Public and Personal Health..... (3 cred.; jr., sr.; prereq., An. Biol. 1-2 and Psy. 1-2)	V	MWF	101bMH	Dr. O'Brien

* Consult the bulletin of the Law School.

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

§ Woman's Hall, University Farm.

‡ Students who take this Course 3 need not take the required Physical Education Course 4.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
52f,w,s	Health Care of the Family..... (3 cred.; jr., sr.; prereq., Bact. 51, Physiol. 4) (Lab. sections limited to 20)	Lect. I Lab. Sec. 1 VI, VII 2 VI, VII	S TTh	213HE §	Dr. Mayer Miss Fisher
		(fall, spring)	MF	§	Miss Fisher
		(winter)	TTh	§	Miss Fisher
53f,s	Elements of Preventive Medicine (3 cred.; jr., sr.; prereq., Psy. 1-2, Bact. 51 or equiv.)	II	MWF	101bMH	Dr. Diehl, Dr. Lees
58w	Maternal and Child Hygiene..... (2 cred.; jr., sr.; prereq., 50 or 52 or 53)	Ar	Ar	101bMH	Dr. Boynton, Dr. Adair, and others
59w	Social Hygiene	Ar	S	101bMH	Ar
60w	The Tuberculosis Problem..... (2 cred.; jr., sr.; prereq., 50 or 52 or 53)	IV	TS	101bMH	Dr. Myers
61w	Mental Hygiene	Ar	Ar	101bMH	Dr. Hamilton and others
62f,w	Principles of Public Health Nurs- ing	II	TThS	101bMH	Miss Butzerin
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 (2 cred.; jr., sr.; prereq., 62)	Ar	Ar	Ar	Miss Butzerin
66f,w,s	Field Practice in County Nursing (2 cred.; jr., sr.; prereq., 62)	Ar	Ar	Ar	Miss Butzerin
67f,w,s	Field Practice in a Tuberculosis Sanatorium	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
	(5 cred.; jr., sr.; prereq., 62)				
73w	Occupational Hygiene and Disease (2 cred.; jr., sr.; prereq., 53)	IV	MW	101bMH	Dr. Myers
80w,s	Educational Hygiene	II	MWF	101bMH	Dr. Diehl
	(3 cred.; jr., sr.; prereq., 50 or 52 or 53)				

§ Woman's Hall, University Farm.

PROGRAM

No.	Title	Hour	Day	B'dg.	Instructor
102f,w,s	Sanitation (Cred. ar.; jr., sr., grad.; prereq., Bact. 101; Anal. Chem. 1-2 or 7; Org. Chem. 7 or 53; Phys. 24, 34, 44)	Ar	Ar	*	Dr. Whittaker, Dr. Archibald, Mr. Childs
103s	Public Health Bacteriology..... (3 cred. or ar.; jr., sr., grad.; prereq., Bact. 101, 116)	VII, VIII or ar	MWF or ar	*	Miss Wade
105f,w,s	Vital Statistics (Cred. ar.; jr., sr., grad.; prereq., 53 and Sociol. 45, and open to grad. med. stud.)	Ar	Ar	*	Dr. Chesley
106f,w,s	Public Health Administration.... (Cred. ar.; jr., sr., grad.; prereq., 53 or 101)	Ar	Ar	Ar	Dr. Chesley, Dr. Diehl
107s	Sanitary Surveys (2 cred.; jr., sr., grad.; prereq., 53 or 100)	Ar	Ar	Ar	Dr. Myers

PSYCHOLOGY

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

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

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

* State Board of Health.

No.	Title	Hour	Day	B'dg.	Instructor
4f-5w†	Intro. Lab. Psychology..... (4 cred.; soph., jr., sr.; with or after 1-2, or 1-6) (Sections limited to 40)				
	Sec. 1	I, II	TTh	211Psy	Mr. Bills and others
	(For pre-leg. stud.) 2	III, IV	TS	211Psy	
	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. Bills and others
	2	III, IV	MTWF	211Psy	
15s	Psychology of Sensation..... (3 cred.; soph., jr., sr.; prereq., 1-2 or 1-6)	II	TThS	Psy	Mr. Bills
56w*	Psychology of Advertising..... (3 cred.; jr., sr.; prereq., 1-2 or 1-6, and Prin. of Econ.)	VII	MWF	301F	Mr. Paterson
6of	Psychology in Personnel Work.... (3 cred.; jr., sr.; prereq., 1-2 or 1-6, 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. Bills
108f	Systematic Psychology (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7)	III	TThS	109Psy	Miss Heid- breder
109w	Readings in Psychology..... (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or An. Biol. 1-2)	III	TThS	109Psy	Miss Heid- breder
114-115†	<i>Human Behavior</i> (6 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 114-115; or 144-145 by permission)				<i>Not offered in 1926-27</i>
124f	Psychology of Learning..... (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7)	IV	MWF	109Psy	Mr. Heron
125f-126w-127s†	Psych. of Individual Differences.. (6 or 9 cred.; jr., sr., grad.; pre- req., 1; 2 or 6; 4-5 or 7, or Ed. Psy. 116-117)	II	MWF	109Psy	Mr. Woodrow
130s	Vocational Psychology (2 cred.; jr., sr., grad.; prereq., 1-2 or 1-6, 4 additional cred. in psy. ed., or a soc. sci.)	IX, X	F	Psy	Mr. Paterson
137s	Psychology of Learning (Ad- vanced) (3 cred.; jr., sr., grad.; prereq., 124 or equiv.)	III	MWF	109Psy	Mr. Heron

* Cannot be counted for a minor sequence.

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

No.	Title	Hour	Day	Bldg.	Instructor
1408	Social Psychology (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or Biol. 1-2 or 10 cred. in a soc. sci.)	III	TThS	109Psy	Mr. Bird
144w-145s†	Abnormal Psychology (6 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or Biol. 1-2 or 10 cred. in a soc. sci.)	IV	MWF	115Psy	Mr. Anderson
151f-152w-153s†	Animal Psychology (6 or 9 cred.; jr., sr., grad.; pre- req., 1-2 or 1-6; 4-5 or 7, or Biol. 1-2)	VII VIII	MW MWF	109Psy	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 MWThFS MTWFS MTWThF MTWThF	213F 227F 227F 226F 202F	Ar Ar Ar Ar Ar
1w-2s†*	Beginning French (See 1f-2w)	IV VI	MTWFS MTWThF	202F 202F	Ar Ar
1s-(2f)†*	Beginning French (See 1f-2w)	I IV	TWThFS MTWFS	227F 102F	Ar Ar
(3s)-4f	Intermediate French (See 3f-4w)	II IV VI	MWThFS MTWFS MTWThF	306F 124F 124F	Ar Ar Ar
3f-4w	Intermediate French (10 cred.; all; prereq., 1-2, or 2 yrs. high school French)	I III VII	TWThFS MTThFS MTWThF	124F 226F 213F	Ar Ar Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 6, Science, Literature, and the Arts bulletin, Part II.

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

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

No.	Title	Hour	Day	B'dg.	Instructor
3w-4s	Intermediate French	I	TWThFS	202F	Ar
	(See 3f-4w)	VI	MTWThF	213F	Ar
3s-(4f)	Intermediate French	I	TWThFS	213F	Ar
	(See 3f-4w)	II	MWThFS	227F	Ar
		IV	MTWFS	227F	Ar
		VI	MTWThF	226F	Ar
		VII	MTWThF	202F	Ar
8f-9w-10s‡	Scientific French (pre-med.)....	I	MWF	3F	Ar
	(9 cred.; pre-med.; prereq., 3 or equiv.)				
20f‡	Oral and Written French.....	III	MTThFS	303F	Ar
	(5 cred.; all; prereq., 4 or 3 yrs. high school French)	VII	MTWThF	227F	Ar
20s‡	Oral and Written French.....	I	TWThFS	15F	Ar
	(See 20f)	III	MTThFS	226F	Ar
		VII	MTWThF	213F	Ar
21f-22w-23s†	Survey of French Lit.....	II	TThS	209½F	Mr. Sirich
	(9 cred.; all; prereq., 3-4 or 20 or 4 yrs. high school French)	III	TThS	227F	Mr. Barton
		VII	MWF	107F	Mr. Searles
24w-25s†	Survey of French Lit.....	III	MTThFS	303F	Miss Phelps
	(10 cred.; all; prereq., 3-4 or 20 or 4 yrs. high school French)	VII	MTWThF	303F	Miss Nissen
49f,w,s	French Pronunciation	VIII	MWF	207F	Mr. Morand
	(3 cred.; all; prereq., 3-4 or 4 yrs. high school French)				
50f-51w-52s†	French Conversation‡.....	III	MW	201F	Ar
	(3 cred.; jr., sr.*; prereq., 3-4)	VI	MW	302F	Ar
53f-54w-55s†	French Composition	III	F	201F	Ar
	(3 cred.; jr., sr.*; prereq., 3-4)	VI	F	302F	Ar
56f-57w-58s†	Adv. French Conversation‡.....	II	MW	113F	Ar
	(3 cred.; jr., sr.*; prereq., 20 or 50-51-52)	III	MW	113F	Ar
		VI	MW	108F	Ar
59f-60w-61s†	Adv. French Composition.....	II	F	113F	Ar
	(3 cred.; jr., sr.*; prereq., 20 or 53-54-55)	III	F	113F	Ar
		VI	F	108F	Ar
62w	Practical French Phonetics.....	VIII	MWF	203F	Mr. Ditchy
	(3 cred.; jr., sr.*; prereq., 20 or 50-51-52 and 53-54-55)				
80f-81w-82s†	French Lit., 19th Century.....	IV	MWF	201F	Mr. Barton
	(9 cred.; jr., sr.*; prereq., 21-22-23 or 24-25)	VII	MWF	206F	Mr. Clefton
100s	French Oral Diction.....	VIII	MTWF	203F	Miss Guinotte
	(4 cred.; jr., sr., grad.; prereq., 62)				
103f-104w-105s†	French Syntax and Comp.....	VI	F	203F	Mr. Barton
	(3 cred.; jr., sr., grad.; prereq., 59-60-61)				

† 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). No student may receive credit for both Course 20 and Courses 50-51-52 and 53-54-55.

§ Students may enter any quarter.

* Open without petition to sophomores who have the prerequisites and who satisfy the requirements in General Information, section 43, Science, Literature, and the Arts bulletin, Part I.

† Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately. No student may receive credit for both Course 20 and Courses 50-51-52 and 53-54-55.

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
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. Sirich
121-122-123†	French Lit.: 16th Century..... (9 cred.; jr., sr., grad.; prereq., 80-81-82, or 115-116-117 or 118- 119-120)	Not offered in 1926-27			
141s	Realistic Novel: 19th Century.... (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	217F	Mr. Olmsted
153s	French Lyric Poetry..... (4 cred.; jr., sr., grad.; prereq., 20-21-22, or 24-25)	VI	MTWTh	212F	Mr. Searles
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
162w	French Romantic Poets..... (4 cred.; jr., sr., grad.; prereq., 80-81-82, or 115-116-117 or 118- 119-120)	VII	MTWF	203F	Mr. Morand
171f-172w-173s†	History of French Language.... (3 cred.; jr., sr., grad.; prereq., 59-60-61)	VIII	Th	203F	Mr. Sirich
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

1f-2w†	Beginning Italian (10 cred.; all; no prereq.)	II	MWThFS	203F	Miss Phelps
3s-(4f)	Intermediate Italian (10 cred.; all; prereq., 1-2)	II	MWThFS	203F	Miss Nissen
71w	Modern Poetry (Leopardi, Car- ducci) (4 cred.; jr., sr.*; prereq., 3-4‡)	III	MWThF	203F	Miss Phelps
72	Modern Drama (<i>Giacosa, Bracco,</i> <i>Pirandello</i>) (4 cred.; jr., sr.*; prereq., 3-4‡)	Not offered in 1926-27			
73s	Boccaccio (4 cred.; jr., sr.*; prereq., 3-4‡)	III	MWThF	203F	Miss Phelps

* Open without petition to sophomores who have the prerequisites and who satisfy the requirements in General Information, section 43, Science, Literature, and the Arts bulletin, Part I.

† 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.

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the Arts bulletin, Part II.

No.	Title	Hour	Day	B'dg.	Instructor
74	<i>Petrarch</i>	Not offered in 1926-27			
	(4 cred.; jr., sr.*; prereq., 3-4†)				
159f-160w†	Dante	IV	MWF	203F	Miss Phelps
	(6 cred.; jr., sr., grad.; prereq., one course above 50)				
161-162	<i>The Sixteenth Century</i>	Not offered in 1926-27			
	(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 4 cred. in Eng. besides Fr. Eng.)				

SPANISH

(1s)-2f†||	Beginning Spanish	III	MTThFS	322F	Ar
	(See 1f-2w)	VII	MTWThF	201F	Ar
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(w)	227F	Ar
	(See 1f-2w)	{ VII	MTThF(s)		
		{ V	W(s)		
1s-(2f)†||	Beginning Spanish	II	MWThFS	201F	Ar
	(See 1f-2w)	VI	MTWThF	107F	Ar
(3s)-4f	Intermediate Spanish	II	MWThFS	202F	Ar
	(See 3f-4w)	IV	MTWFS	202F	Ar
		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)				
53f-54w-55s†	Spanish Composition	II	F	302F	Mr. Arjona
	(3 cred.; jr., sr.*; prereq., 3-4)				

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

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

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

§ See departmental requirements, note on freshman entering with three years' high school French (or Spanish). No student may receive credit for both Course 20 and Courses 50-51-52 and 53-54-55.

() Numbers in parentheses do not refer to the year 1926-27. See Course Numbering, page 20, Science, Literature, and the 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.

|| Credit is usually not given for more than one beginning language. See paragraph 2, page 6, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
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 1926-27</i>			
65f-66w-67s†	Survey of Spanish Lit..... (9 cred.; jr., sr.*; prereq., 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 1926-27</i>			
100	<i>Spanish Oral Diction</i> (4 cred.; jr., sr., grad.; prereq. 56-57-58)	<i>Not offered in 1926-27</i>			
103-104-105†	<i>Spanish Syntax</i> (3 cred.; jr., sr., grad.; prereq., 59-60-61)	<i>Not offered in 1926-27</i>			
110s-111w-112s†	Spanish Lit.: 19th Century..... (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	IV	MWF	108F	Mr. Fichter
115f-116w-117s†	Spanish Lit.: 17th Century..... (6 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	IV	TS	217F	Mr. Krappe
141	<i>Spanish Novel</i> (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	<i>Not offered in 1926-27</i>			
150w-151s	Spanish Dramatic Lit..... (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	III	MW	204F	Mr. Olmsted
156-157-158	Spanish Lit.: 16th Century..... (6 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	<i>Not offered in 1926-27</i>			
159	Cervantes..... (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	III	TThFS	305F	Mr. Fichter
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

SCANDINAVIAN

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, or 1 yr. high school)	I	TWThFS	206F	Mr. Bothne

* 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.

‡ 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	B'dg.	Instructor
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	II	MWThFS	206F	Mr. Stomberg
9s	Intermediate Swedish	II	MWThFS	206F	Mr. Stomberg
10f-11w	Adv. Swedish	I	TWThFS	110F	Mr. Stomberg
12s	Ancient and Medieval Scandina- vian History	I	TWThFS	110F	Mr. Stomberg
45s	Scandinavian Mythology	IV	MWF	206F	Mr. Stomberg
101f-102w-103s	Modern Norwegian Lit.	II	TThS	110F	Mr. Bothne
104f-105w	Modern Scand. History.....	VI	MWF	206F	Mr. Stomberg
107f-108w-109s	Modern Swedish Lit.	VI	MWF	206F	Mr. Stomberg
110	<i>Ibsen</i>	<i>Not offered in 1926-27</i>			
111f-112w-113s	Old Norse (Icelandic).....	II	WF	110F	Mr. Bothne
114f	Strindberg	Ar	Ar	Ar	Mr. Stomberg
116	<i>History of Scandinavian Lan- guages</i>	<i>Not offered in 1926-27</i>			
117s	Earlier Norwegian Lit.	III	MTThFS	206F	Mr. Bothne
130-131-132	<i>Danish Lit. of the 19th Century..</i>	<i>Not offered in 1926-27</i>			
134-135	<i>The Landsmaal Movement.....</i>	<i>Not offered in 1926-27</i>			
136	<i>Björnson</i>	<i>Not offered in 1926-27</i>			

* Credit is usually not given for more than one beginning language. See paragraph 2, page 6, Science, Literature, and the Arts bulletin, Part II.

† Does not count as a senior college course. Not open to sophomores under General Information, section 43, Science, Literature, and the Arts bulletin, Part I.

SOCIOLOGY AND SOCIAL WORK

Major Adviser: R. L. Finney

No.	Title	Hour	Day	B'dg.	Instructor
if	Introduction to Sociology..... (5 cred.; soph., jr., sr., and 3d qtr. fr.; no prereq.)				
	Sec. 1	I	TWThFS	25F	Mr. Chapin
	2	III	MTThFS	5F	
	3	IV	MTWFS	25F	
	4	VI	MTWThF	25F	
	5	VII	MTWThF	5F	
	(University Farm, 3 6	IV	MWF	*	
	cred.)				
rw	Introduction to Sociology..... (See if)				
	Sec. 1	I	TWThFS	25F	Mr. Chapin
	2	III	MTThFS	5F	
	3	IV	MTWFS	25F	
	4	VI	MTWThF	25F	
	5	VII	MTWThF	5F	
	(University Farm, 3 6	IV	MWF	*	
	cred.)				
rs	Introduction to Sociology..... (See if)				
	Sec. 1	I	TWThFS	25F	Mr. Chapin
	2	II	MWThFS	3F	
	3	III	MTThFS	5F	
	4	IV	MTWFS	25F	
	5	VI	MTWThF	25F	
	6	VII	MTWThF	5F	
	7	VII	MTWThF	25F	
	(University Farm 3 8	IV	MWF	*	
	cred.)				
6f,w,s	Modern Social Reform Move- ments (3 cred.; soph., jr., sr.; prereq., 1)				
	Sec. 1	II	TThS	5F	Mr. Clarke
	2	IV	MWF	5F	
	3	VI	MWF	6F	
14f,w	Rural Sociology (3 cred.; soph., jr., sr.; prereq., 1)				
	Sec. 1	III	TThS	107F	Mr. Zimmer- man
	2	V	MWF	25F	
	3	VI	MWF	3F	
	(University Farm) 4	IV	TThS	*	
14s	Rural Sociology (See 14f,w)				
	Sec. 1	III	TThS	107F	Mr. Zimmer- man
	2	V	MWF	25F	
	3	VI	MWF	3F	
45f,w	Social Statistics (5 cred.; soph., jr., sr.; prereq., 1)				
	3	VI	MWF	3F	Mr. Chapin
	4	VII	MTWThF	25F	
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

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
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	Mr. Elmer
55w	Housing Problems..... (3 cred.; jr., sr.; prereq., same as for 51)	I	MWF	15F	Mr. Salsberry
60f,w	Child Welfare..... (3 cred.; jr., sr.; prereq., 51 and 52)	IX	MWF	25F	Mrs. Doyle
70w	Group Work in the Community.. (3 cred.; jr., sr.; prereq., 51)	VIII, IX	T	5F	Miss Meade, Mrs. Mudgett
90f,w,s-91f,w,s- 92f,w,s	Elementary Field Work..... (6 cred.; jr., sr.; prereq., 51 for 90; 52 for 91)				
	(Fall)				
	Sec. 1	I, II, III	MW		Mrs. Mudgett
	2	I, II, III	WF		
	3	VI, VII, VIII	MW		
	4	VI, VII, VIII	WF		
	5	VI, VII, VIII	Th		
	(Winter)				
	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		
100f	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	15F	Ar
103s	Sociology of Conflict..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	25F	Mr. Clarke
110w	Community Organization and So- cial Work in Small Towns and Country..... (2 cred.; jr., sr., grad.; prereq., same as for 101)	VIII, IX	Th	5F	Mr. Elmer
112f	The Rural Social Survey..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	VIII	MWF	25F	Mr. Elmer
114s	Rural Social Institutions..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	III	MWF	*	Mr. Lundquist

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
115	<i>The Rural Church As a Social Institution</i> (3 cred.; jr., sr., grad.; prereq., same as for 101)	<i>Not offered in 1926-27</i>			
119f	The Family (3 cred.; jr., sr., grad.; prereq., same as for 101)	III	TThS	3F	Mr. Clarke
120f	Social Progress (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	15F	Ar
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. Elmer
126-127	<i>Settlement and Community Center Work</i> (4 cred.; sr., grad.; prereq., consent of director)	<i>Not offered in 1926-27</i>			
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	<i>Juvenile Courts and Probation...</i> (2 cred.; jr., sr., grad.; prereq. 51, 52, 53)	<i>Not offered in 1926-27</i>			
133f	Social Case Work in Health Problems (3 cred.; jr., sr., grad.; prereq., 52, 90, and Prev. Med. 50, or 53, or simultaneously)	VI, VII or ar	M 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., open to students taking 134)	Ar	Ar	Ar	Mrs. Mudgett
138W-139S	Mental Case Work..... (6 cred.; jr., sr., grad.; prereq., 52, 90, and Psy. 144-145, or Prev. Med. 61, or simultaneously)	VI, VII	M 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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
152	<i>Seminar: Problems of Institutional Administration</i> (2 cred.; sr., grad.; prereq., consent of director)	Not offered in 1926-27			
153f,w,s-154f,w,s-155f,w,s	Advanced Field Work (3 cred. per qtr.; jr., sr., grad.; prereq., 90 and 91)	Ar	Ar	Ar	Mrs. Mudgett
158w	The Sociology of Revolution (3 cred.; jr., sr., grad.; prereq., same as for 101)	III	MWF	211OL	Mr. Sorokin
187f-188w-189s	Seminar in Ed. Sociology (6 cred.; jr., sr., grad.; prereq., same as for 101, including 1 and 6)	I, II	S	9F	Mr. Finney

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The Bulletin
of the University of
Minnesota

The Graduate School
Announcement for the Years
1925-1927



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UNIVERSITY CALENDAR

1925-26

1925			
September	24-25		Registration of graduate students Physical examination for new students
September	28	Monday	Fall quarter begins, 8:30* a.m.
October	8	Thursday	Examinations in German and French for candidates for advanced degrees
November	5	Thursday	Last day for filing thesis of candidates for the fall quarter
November	7	Saturday	Last day for filing subject-matter of Master's thesis for the spring quarter
November	11	Wednesday	Armistice Day; a holiday
November	26	Thursday	Thanksgiving Day; a holiday
December	17	Thursday	Commencement Convocation
December	19	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
1926			
January	4	Monday	Christmas vacation ends, winter quarter begins, 8:30* a.m.
January	14	Thursday	Examinations in German and French for candidates for all advanced degrees
February	6	Saturday	Last day for filing thesis of candidates for the winter quarter
February	12	Friday	Lincoln's Birthday; a holiday
February	22	Monday	Washington's Birthday; a holiday
March	20	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.
March	29	Monday	Spring vacation ends, spring quarter begins, 8:30* a.m.
April	2	Friday	Good Friday; a holiday
April	8	Thursday	Examinations in German and French for candidates for all advanced degrees
May	3	Monday	Last day for filing thesis of candidates for all advanced degrees
May	17	Monday	Last day for filing written examinations for candidates for all advanced degrees
May	29	Saturday	Last day for oral examinations for candidates for all advanced degrees
May	31	Monday	A holiday (for Memorial Day)
June	7	Monday	Last day for filing bond for publication of Doctor's thesis; last day for depositing binding fee for Master's degree
June	13	Sunday	Baccalaureate service

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

THE GRADUATE SCHOOL

June	12	Saturday	Spring quarter closes
June	14	Monday	Fifty-fourth annual commencement
June	21	Monday	Summer Session, first term begins
July	3	Saturday	Last day for filing thesis of candidates at summer convocation
July	31	Saturday	First term, Summer Session closes
August	2	Monday	Summer Session, second term begins
September	4	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 undergraduate 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.

FEES

	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 \$4 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 bequest 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.

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.

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.

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 normal 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.

The language requirement.—A reading knowledge of a foreign language, modern or ancient, the language to be determined by the major department, is required of candidates for the Master's degree, unless exemption is made in individual cases with the approval of the Executive Committee of the Graduate School. When no other statement is made in the departmental announcement in this bulletin, a knowledge of either French or German is expected. The candidate shall present to the dean

of the Graduate School, not later than the close of the second quarter of residence, a certificate of proficiency in the designated language, signed by the professor in charge of the corresponding language department or his representative.

Candidates for the Master's degree in any 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.

The Master's thesis.—Before the middle of the first quarter in residence the candidate should file at the office of the Graduate School the subject of his thesis. This subject must be approved by his adviser and by the corresponding group committee. It should be on a topic falling within the field of the major. 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 triplicate 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. 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 cheap paper. Samples in the dean's office of both the linen stock and carbon paper should be examined before the thesis is typewritten. The body of the thesis should be double spaced, but footnotes may be single spaced.

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

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

If the thesis is accepted, the candidate must deposit with the registrar, at least one week before commencement the sum of one dollar 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. 17) 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 of engineering experience in positions of responsibility, subsequent to receiving the Bachelor's degree. (If the graduate study is done *in absentia*, five years of experience are required.)

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.

The 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 Engineer 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 in absentia	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 equivalent 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 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.

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.

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 on the thesis. During the last two years, he shall carry an average of at least one course per quarter in his major outside the work from which 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 committee. The requirements concerning form, copywriting, 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

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

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. 15) 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	} Before admission to preliminary examination
Minor	Adviser and minor department	
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	Six weeks before taking the degree
Filing of thesis	Dean	
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, Clarence A. Morrow.

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; 7Ch. Mr. Morrow.
- 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. Five credits. Lect. MWF VI; Lab. MWF VII, VIII, IX; 7Ch. Mr. Palmer.
- 108s. Chemistry of Wheat and Wheat Products. A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and its conversion into food. Prerequisite: organic chemistry. Three credits. MWF I; 201Ch. Mr. Bailey.
- 109s. Selected Flour Laboratory Methods. A laboratory course in which particular attention is given to recently developed methods for testing wheat products. Less extensive than 110. Designed for men with commercial laboratory experience. Prerequisite: Course 101-102 or Chemistry 131-132, parallel 108. Three credits. MW VI, VII, VIII, IX; 7Ch. Mr. Bailey.

- 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. Five credits. MWF VI, VII, VIII, IX; 7Ch. Mr. Bailey.
- 111f,su-112w,su. Phytochemistry. An advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes and pigments, and their physico-chemical relations to the vital processes involved in growth and nutrition. Prerequisites: organic chemistry, biology, 1 year. Three credits each quarter. Lect. MWF III; Rec. Th VI; 201Ch. 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; 7Ch. Mr. Morrow.
- 116w. Advanced Animal Nutrition. Recent developments in animal nutrition, covering the field of proteins, mineral metabolism, vitamins, and the relation of nutrition to disease. Prerequisite: Course 15 or equivalent. Two credits. TTh III; 351Ch. 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, students planning to register for this course should obtain permission from the instructors before registration.) Prerequisite: Course 116. Three to 5 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 5 credits. Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman, Miss Kennedy, Mr. Morrow.

COURSES PRIMARILY FOR GRADUATE STUDENT

- 201f,w,s. Seminar in Plant Chemistry, Colloids and Proteins. One credit. Ar. 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, animal, or human nutrition. Three or 5 credits. Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman, Mr. Morrow.
- 205f,w,s,su. Special Topics in Biochemical Literature. Library work followed by the preparation of written reports upon either the historical development or the current literature of special biochemical problems. A reading knowledge of German is necessary and of French desirable. Prerequisite: Course 206, 207, or 208. Three credits. Mr. Gortner, Mr. Bailey

- 206f. Colloids. Lectures dealing with the colloidal state, the preparation and properties of colloidal solutions, and the relation of these to biochemical processes. Prerequisite: Course III-112, or physical chemistry. Three credits. MWF II; 351Ch. Mr. Gortner.
- 207f. Enzymes.¹ Lectures dealing with the nature of enzyme action, including methods of preparation and investigation of enzymes, their physical and chemical properties and their methods of action. Prerequisites: Course III-112, or physiologic chemistry. Three credits. MWF III; 351Ch. Mr. Willaman.
- 208w. Proteins.¹ Lectures on the composition, structure, biochemical reactions, and functions of the protein and amino acids with special emphasis upon those which are concerned in plant growth and metabolism, animal food, and industrial processes. Prerequisite: Course III-112, or advanced organic chemistry. Three credits. MWF II; 351Ch. Mr. Gortner.
- 209w. Carbohydrates.² A lecture and library course on the synthesis, structure, reactions, and functions of carbohydrates, with especial reference to those which are of plant or animal origin and which play a rôle in biochemical or industrial processes. Prerequisite: Course III-112, or advanced organic chemistry. Three credits. TThS II; 351Ch. Mr. Willaman.
- 212f,w,s. Special Topics in Nutritional Chemistry. A course comprising lectures, independent library study, and oral presentation by students, of special assigned topics in animal nutrition. A reading knowledge of German is essential and French desirable. Prerequisite: Course 116. Three credits. Mr. Palmer.

AGRONOMY AND FARM MANAGEMENT

Professors Andrew Boss, Herbert K. Hayes; Associate Professors Albert C. Army, George A. Pond, Fred Griffiee.

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

In farm management, for major work, Courses 102, 103, and 104, or their equivalents, and at least 6 credits in elementary and agricultural economics. For minor work, at least 12 credits in the elementary agricultural sciences (Farm Crops 1, Soils 4, and Animal Husbandry 3-4). Exemption from the language requirement for the Master's degree may be made in individual cases.

In plant-breeding, for major work, Courses 121, 122, 131, 132, or their equivalents, and a reading knowledge of German or French. With the approval of the adviser, courses in agricultural biochemistry, botany, farm crops, horticulture, plant pathology, and plant physiology, may be accepted

¹ Offered in alternate years, will be offered in 1925-26.

² Offered in alternate years, not offered in 1925-26.

as major work. For minor work, two years of botany, one year of zoology, and the elementary courses in farm crops. Students majoring in plant breeding 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 AGRONOMY

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 121f. Cereal Crops. An advanced study of the cereal crops. Structure, group classification, improvement, growing, and utilization. Brief score card practice and a limited amount of placing on intrinsic value included. Prerequisites: Course I; botany, 10 credits. Three credits. TTh VI, VII; 2Ad(F). Mr. Army.
- 122w. Corn and Potato Crops. A study of the corn and potato crops similar to that outlined for cereal crops. Prerequisites: Course I; botany, 10 credits. Three credits. TTh V, VI, VII; 2Ad(F). Mr. Army.
- 123s. Forage and Fiber Crops. A study of the forage crops through assigned reading, laboratory and field work. Prerequisites: Course I; botany, 10 credits. Three credits. TTh V, VI, VII; 2Ad(F). Mr. Army.
- 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. Senior, graduate. Prerequisites: Courses 121, 122, 123, or equivalent. Three credits. MTWThF I, II; 2Ad(F). Mr. Steinmetz.
- 133w. Judging and Grading Farm Crops. Prerequisites: Courses 1, 121, 122. Course 122 may be concurrent. Three credits. TTh VIII; 2Ad(F). Mr. Army.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201Ar. Research in Farm Crops. It is desirable that students remain during one summer to work out research problems. Prerequisites: 9 credits in farm crops. Mr. Army.
- 202f,w. Farm Crops Seminar. Weekly meetings for the discussion of current literature and for reports of thesis problems. Prerequisites: 9 credits in farm crops. Maximum of three credits. Mr. Army.
- 203Ar. Special Topics in Farm Crops Literature. Technique in conducting experimental work and interpreting results. Library work, including the making of abstracts, reviews, and bibliographies. Prerequisites: Courses 121, 122, 123, and a reading knowledge of German. Maximum of six credits. Mr. Army.
- 204su. 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 classifications are available. Senior, graduate. Prerequisites: Courses 121, 122, 123; Botany 4, 5, 6. Three credits. MWF I, II; 2Ad(F). Mr. Army.

COURSES IN FARM MANAGEMENT

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 102f,w,s. Farm Management: Organization. The business side of farming and farm organization and equipment is emphasized. Prerequisites: Course 1; Agricultural Economics 1; Soils 4. Three credits. MWF II; 24Ad(F). Mr. Boss, Mr. Garey.
- 103w,s. Farm Management: Operation. A continuation of Course 102 with special attention to farm operation. Prerequisites: same as above with Course 102. Three credits. MWF I; 24Ad(F). Mr. Boss, Mr. Garey.
- 104s. Farm Management. A methods course, covering cost of production studies, farm business analysis, farm practice and farm management literature. Prerequisites: Courses 102 and 103. Three credits. MWF II; 18Ad(F). Mr. Boss.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 220f. Farm Management Surveys. Special and intensive work in studying the various factors entering into farm organization. Prerequisites: 9 credits in Farm Management. Three credits. Ar. 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. Prerequisites: 9 credits in Farm Management. Three credits. Mr. Pond.
- 222Ar. Problems in Farm Record Analysis. A laboratory study of methods of recording and analyzing the farm business. Prerequisites: 9 credits in Farm Management. Mr. Pond.
- 223Ar. 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. Prerequisites: 9 credits in Farm Management, Agricultural Economics 7, or equivalent. Three to six credits. Mr. Boss, Mr. Pond, Mr. Garey.
- 224w,225s. Advanced Farm Organization. Analysis of farm organization and the application of survey factors and cost factors in organizing the business of farming. Prerequisites: 12 credits in Farm Management. Three to six credits. Ar. Mr. Boss.

COURSES IN PLANT-BREEDING

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 131f,w. Principles of Genetics. Given in co-operation with the Division of Horticulture. Designed to familiarize students with underlying principles of breeding. Prerequisites: botany, 10 credits; or animal biology,

- 10 credits. Three credits. ThS I; T I, II; 24Ad(F). Mr. Aamodt, Mr. Beaumont.
- 132s,su. Farm Crops Plant-Breeding. Applied genetics is emphasized. Prerequisite: Course 131. Three credits. ThS I; T I, II; 4Ad(F). Mr. Griffee.
- 134f,w. Laboratory Problems in Genetics. Methods of taking and arranging genetics data. Special inheritance problems with *Drosophila*. Two credits. Mr. Brewbaker.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 241Ar. 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. Prerequisites: Courses 131, 132. Mr. Hayes.
- 242f,s. Plant-Breeding Seminar. History, plant genetics in relation to plant-breeding, and a discussion of research problems. Weekly meetings. Prerequisite: Course 131. One credit per quarter. Mr. Hayes.
- 243f. Methods in Plant-Breeding. Emphasis is given 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. Prerequisite: Course 132. Three credits. Mr. Hayes.
- 244su. Laboratory Methods in Plant-Breeding. Supplementing 243f. Practice in field laboratory technique, methods of controlling pollination and handling of plant cultures. Prerequisites: Courses 131, 132. Three credits.
- 245w. Advanced Genetics. Current genetic literature. Linkage, genetic stability, chromosomal aberrations, and the probable errors of Mendelian ratios will be emphasized. Prerequisite: Course 131. Three credits. Mr. Hayes.
- 246w. Genetics Seminar. Important recent contributions to genetic theory and practice. Prerequisite: Course 131. Prerequisite or parallel: Course 245. Two credits. Mr. Hayes.

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

Professors William A. Riley, Royal N. Chapman, Hal Downey, John B. Johnston, Arthur G. Ruggles, Charles P. Sigerfoos; Associate Professors Dwight E. Minnich, Elmer J. Lund; Assistant Professor Oscar W. Oestlund.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 107s. Protozoology. Lectures, references, and laboratory work on the structure and life histories of Protozoa. Three credits. MWF I, II; 211,213AB. Mr. Sigerfoos.
- 108s. Experimental Zoology. An experimental study of cells and lower organisms with reference to their behavior. Lectures, laboratory, and reading. Ar. Mr. Minnich.
- 109f,110w,111s. General Physiology. A thoro survey of fundamental physiological processes in organisms. Based on Bayliss's *Principles of General Physiology*. Laboratory, lectures, and reading. Fifteen credits. MWF V-VIII; 10AB. Mr. Lund.
- 117f-118w-119s.† Ecology of Insects. General principles of ecology with special reference to the insects of Minnesota. Lectures, laboratory, assigned reading, and field work. Nine credits. TTh V-VII; 202AB. Mr. Chapman.
- 124su. Advanced Ecology. Similar to Course 117-118-119 with special field work. Five credits. Ar. 202AB. Mr. Chapman. (Not offered in 1925 and 1926.)
- 125f-126w-127s.† Advanced Entomology. Morphology and classification of insects, with lectures on the history of entomology. Nine credits. TThS III, IV; 204AB. Mr. Oestlund.
- 130w. Biology and Taxonomy of the Aphididae. Intensive study of the natural history, bibliography, and classification of the Aphididae. Three credits. MWF III, IV; 204AB.
- 139-140.† Histology and Development of Insects. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. Six credits. T II, III, IV and ar.; 324AD(F). 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 V-VII; 202AB. Mr. Riley.
- 181f-182w.† General Embryology. Principles and laws of animal development in connection with origin and development of germ cells, sex chromosomes, fertilization, cleavage, etc. Six credits. MWF V, VI; 201,211AB.

- 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.
- 187w. Seminar. Reading and discussion covering philosophical aspects of zoology. Admission by consent of the instructor. Mr. Minnich.
- 197f-198w-199s. Problems. Advanced work in some special line. Nine or 18 credits. Hours and days arranged. Mr. Riley, Mr. Downey, Mr. Johnston, Mr. Sigerfoos, Mr. Lund, Mr. Chapman, Mr. Minnich, Mr. Oestlund.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-204. Research in Entomology. Hours and days arranged. Mr. Riley, Mr. Chapman, Mr. Oestlund, Mr. Graham.
- 205-208. Research in Economic Entomology. Mr. Ruggles, Mr. Graham.
- 209-212. Research in Economic Vertebrate Zoology.
- 213-216. Research in Biological Oxidations. Mr. Lund.
- 217-218-219. Research in the Physiology of the Lower Organisms with Special Reference to the Protozoa. Mr. Lund.
- 229-232. Research in Animal Histology. Mr. Downey.
- 233-236. Research in Vertebrate Connective Tissue with Special Reference to the Cellular Elements. Mr. Downey.
- 237-238. Research in Vertebrate Hematology. Mr. Downey.
- 245-248. Comparative Neurology. A study in the structure and functions of the nervous system of vertebrate animals and of the evolution of the chief nervous mechanisms. Prerequisites: two years in comparative or human anatomy. Mr. Johnston.
- 249-252. Research in Neurology. Mr. Johnston.
- 253-254. Dynamics of Protoplasm and Cells. Physical and chemical interpretation of the structure of living protoplasm, and vital processes such as permeability, secretion, enzyme action, regeneration, stimulation, and energy transformation in the living cell. Research accompanied by lectures. Mr. Lund.
- 257-260. Sensory Physiology of Invertebrates. Mr. Minnich.
- 261-264. Research in Parasitology and Medical Entomology. Mr. Riley.
- 265-268. Research in Insecticides.

ANIMAL HUSBANDRY

Professors Walter H. Peters, Evan F. Ferrin, Henry W. Vaughan; 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. 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. Horsepower; factors determining a horse's efficiency for work. Three credits. TTh II; 3Sh(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. Mr. Vaughan.
- 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, VI, 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; 3St(F) and Th 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.
- 108s. Seminar. Special assignments and review of investigations pertaining to the livestock industry. Three credits. MWF II; 3St(F). 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. Mr. Vaughan.
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, Mr. Vaughan.
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.
- 207s. 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. TS IV; and W V, VI, VII; Meat Shop. Mr. Anderson.

ANTHROPOLOGY

Professor Albert Ernest Jenks; Associate Professor Wilson D. Wallis.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 108f. Philippine Peoples. Comparative study of the four large ethnic and cultural groups in the Philippine Islands; the policy of the insular

- government as it affects American home interests in the Orient. TThS IV; 15F. Mr. Jenks.
110. Physical Anthropology. Mr. Wallis.
- 112s. The American Negro. Development of the American negro; his characteristics, conditions, and developing tendencies. Negro and immigrant adjustments. Prerequisites: three courses. Three credits. MWF III; 15F. Mr. Jenks.
- 113s. Peoples of Europe. Prerequisites: three courses. Three credits. MWF II; 15F. Mr. Jenks.
- 121w. Advanced Physical Anthropology. Prerequisites: physical anthropology, anatomy, or comparative anatomy. Three credits. Mr. Wallis.
- 123w-124s. Problems in Anthropology. An advanced course of method and independent research. Six credits. Mr. Jenks.
- 161s. Primitive Religion. Religious ideas and practices of primitive peoples. Prerequisites: Anthropology 51, or 62, or Philosophy 102. Three credits. Mr. Wallis.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 204f-205w-206s. Seminar in Anthropology. Individually directed research. Prerequisites: three courses. Three credits each quarter. Ar. 12F. Mr. Jenks, Mr. Wallis.

ARCHITECTURE

Professors Frederick M. Mann, Leon E. Arnal.

- 119f,w,s. Special Researches in Architectural History. Prerequisite: completion of undergraduate architectural history. Five credits or less per quarter. MW III; 320ME. Mr. Mann, Mr. Forsythe.
- 120f,w,s. Archaeology. Prerequisite: completion of undergraduate architectural history. Three credits or less per quarter. Ar. hours. Mr. Arnal.
- 139f,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.
- 140f,w,s. Technology of Building Materials. Prerequisite: Arch. 49 or Arch. 143. Three credits per quarter. Ar. hours. Mr. Jones.

ASTRONOMY

Professor Francis P. Leavenworth; Assistant Astronomer William O. Beal.

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

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w-103s. Practical Astronomy. Theory and use of astronomical instruments; astronomical photography, with measures of plates; study of method of least squares. Prerequisite: Mathematics 50. Three to 6 credits. MWF III; 124F. Mr. Leavenworth.
- 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. Mr. Leavenworth.

COURSES PRIMARILY FOR GRADUATE STUDENTS

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

BOTANY

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

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. Elementary Biometry. Prerequisite: Eighteen credits in Biological sciences. Three credits. Ar. 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. (Not offered in 1926-27.) 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. (Not offered in 1925-26.) Mr. Butters.
- 113f-114w-115s. Advanced Taxonomy. An advanced course in which special attention is given to the taxonomy and difficult natural groups, involving systematic principles and practice, rules of nomenclature, systems of classification, etc. MWF V, VI; 202AB. Mr. Rosendahl.
- 118w-119s. Cytology. A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of the

- history of cytological investigations. Methods of cytological research indicated in the laboratory. MWF I, II; 202AB. Mr. Rosendahl.
- 123-124f-125w-126s. Morphology and Taxonomy of the Algae. Advanced studies in selected groups. Prerequisites: 15 credits including Course 12 for each course. Three credits for each course. TTh VI, VII, VIII; 104AB. Miss Tilden.
- Any of the above courses may be taken separately.
- 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. Prerequisites: 18 credits. Five credits. Ar. 213AB. 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. Ar. G. 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. MTWFS III, IV; G. Mr. Cooper.
- 133s. Forest Geography of North America. Preliminary discussion of the principles of plant distribution followed by a detailed study of the forest regions of North America. Prerequisite: Course 21. Five credits. MWF VI, VII; G. Mr. Cooper.
- 141f. Physical Phases of Plant Physiology. The intake and translocation of materials, and the energy relations of the plant. Prerequisites: Course 22 and general organic chemistry. Five credits. MTWThF I, II; G. Mr. Harvey.
- 142w. Plant Metabolism. The synthesis of plant food, its transformation and utilization by the plant. Prerequisites: Course 22 and general organic chemistry. Five credits. MTWThF I, II; G. Mr. Harvey.
- 143s. Plant Metabolism and Growth. A continuation of Course 142, dealing with respiration, growth, and movement. Prerequisites: Course 22 and general organic chemistry. Five credits. MTWThF I, II; G. 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: Course 22 and general organic chemistry. Five credits. MTWFS III, IV; G. Mr. Harvey.
- 145f,w,s. Advanced Biometry. Prerequisite: Course 101. Three credits. Ar. Mr. Harris.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202-203. Research Problems in the Morphology of Vascular Plants. Mr. Butters.
- 205-206-207. Research Problems in the Taxonomy of Angiosperms. Mr. Rosendahl.
- 209-210-211. Research Problems in Algae. Miss Tilden.

- 213-214-215. Research Problems in Embryology. Mr. Butters.
217-218-219. Special Research Problems in the Taxonomy and Distribution of Algae. Miss Tilden.
221-222-223. Research Problems in Ecology. Mr. Cooper.
224. Research Methods in Plant Physiology. Mr. Harvey.
225-226-227. Research Problems 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 above research subjects.
237-238-239. Research Problems in Biometry. Mr. Harris.

CHEMISTRY

Professors Paul H. M.-P. Brinton, George B. Frankforter, William H. Hunter, Frank H. MacDougall, M. Cannon Sneed; Associate Professors I. William Geiger, Everhart P. Harding; Assistant Professors Lillian Cohen, Walter M. Lauer, Lloyd H. Reyerson, Lee I. Smith, Nelson W. Taylor.

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) 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 10 credits in organic chemistry. All candidates must present at least one year of college physics or one year of college mathematics. (b) 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 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 fulfilment of a minor will be made after consultation with the student's adviser. Either Analytical Chemistry, Courses 120-121 or Organic Chemistry, Courses 135-136-137 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.

GENERAL INORGANIC CHEMISTRY

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, complexions, etc. Prerequisites: Courses 21, 36. Three credits per quarter. Lect. MWF IV; 111C. Mr. Sneed.

ANALYTICAL CHEMISTRY

- 120w-121s. Quantitative Analysis. General principles, methods, and procedure both gravimetric and volumetric. Typical problems; laboratory practice. Prerequisite: Course 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. One lecture, seven laboratory hours per week. Prerequisite: Course 21 or 27. Three credits. Lect. T VI; 315C. Lab. T VII-IX; Th VI-IX; 310C. Mr. Brinton.
- 127f-128w-129s. Chemistry of the Rare Elements. Chemical relations and general reactions of rarer elements not considered in general courses. Analyses of commercially important ores and compounds of these elements are made. One lecture and six laboratory hours per week. Prerequisite: Course 21. Three credits per quarter. Mr. Brinton.
- 227f-228w-229s. Selected Topics in Analytical Chemistry. Analytical problems of an advanced nature presenting special difficulties will be selected for study and investigation in the laboratory, in the library, and by conference. Open only to graduate students who have had 18 credits of quantitative analysis, and who have a reading knowledge of French and German. Two, three, or four credits per quarter. Mr. Brinton.

ORGANIC CHEMISTRY

- 131s. Organic Analysis. Practice in the identification of organic compounds, and the modern methods of quantitative organic analysis. Prerequisite: Course 37. Three credits. Mr. Lauer.
- 132w. The Rise and Development of Organic Chemistry. Includes biographical and other phases necessary to a complete discussion of the subject. Prerequisite: Course 37. Two credits. Mr. Frankforter.

- 133f. 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 Chemistry 138. Prerequisite: Course 37. Three credits. Lect. MWF II; 325C. Mr. Smith.
- 134f. The Terpenes. Includes a complete review of the terpenes proper, together with a discussion of the gums and resins, and other allied compounds. May be accompanied by appropriate laboratory work in Chemistry 138. Prerequisite: Course 37. Two credits. Mr. Frankforter.
- 135f-136w-137s. Organic Chemistry. Full discussion of aliphatic and aromatic series with preparation of some of the more important compounds; other work of special nature will also be required. Offered to graduate students taking their minor in chemistry. Prerequisite: Course 13. Five credits per quarter. Lect. MWF III; 325C. Rec. Th III; 111C. Lab. TTh VI-VIII; 390C. Mr. Hunter.
- 138f,w,s. Advanced Organic Chemistry Laboratory Work. Difficult preparations and problems. It is intended primarily to supplement the student's knowledge of the methods of organic chemistry. Students may also register for this course who desire appropriate laboratory work for other advanced courses. Prerequisite: Course 37. Two to five credits. Lab. ar; 390C.
- 139f,w,s. Advanced Organic Chemistry Laboratory Work. An introduction to research work. These advanced laboratory courses may be taken under any member of the Division of Organic Chemistry. Prerequisite: Course 37. Two to five credits. Lab. ar; 390C.
- 191f-192w-193s. Advanced Organic Chemistry. An introduction to the literature of organic chemistry. Structure, reaction mechanism, and relation of physical properties to constitution. May be accompanied by appropriate laboratory work in Chemistry 138-139. Prerequisite: Course 37. Three credits per quarter. TThS III; 315C. Mr. Hunter.
- 231f-232w-233s. Organic Chemistry Seminar. One hour a week. Open only to students taking research in organic chemistry. One credit. Mr. Hunter.

PHYSICAL CHEMISTRY

- 140f-141w-142s. Physical Chemistry. A general survey of the subject. Three lectures and one recitation. Laboratory work three or six hours per week. Prerequisites: two years college chemistry, 1 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.
- 143f,w. Physical Chemistry. Designed chiefly for medical and biological students. Prerequisite: Course 32. Four credits. Mr. Taylor.
- 146f-147w-148s. Advanced Physical Chemistry. Three lectures and one recitation. Laboratory work for one three-hour period may be taken if desired. Prerequisites: 142s and calculus. Three credits per quarter, or four with laboratory. Mr. Taylor.

- 149s. Principles of Colloidal Chemistry. Prerequisites: Course 141 and calculus. Two credits. (Not offered in 1925-26.) Mr. Reyerson.
- 150s. Application of Colloidal Chemistry. Prerequisite: Course 141. Two credits. Mr. Reyerson.
- 157f-158w-159s. Colloid Chemistry Laboratory. Credits and hours to be arranged. Must be preceded or accompanied by Physical Chemistry 149 or 150. Mr. Reyerson.
- 243f-244w-245s. Thermodynamics and Chemistry. A detailed study of the principles of thermodynamics and their application to physical and chemical phenomena. Prerequisites: Course 142 and calculus. Four credits per quarter. Mr. MacDougall.
- 246f-247w-248s. Kinetic Theory and Atomistics. Kinetic theory of gases and liquids, crystal structure, structure of atom, quantum theory. Prerequisites: Course 142 and calculus. Four credits per quarter. (Not offered in 1925-26.) Mr. MacDougall.
- 250f-251w-252s. Physical Chemistry Seminar. One hour a week. For students taking advanced courses in physical chemistry. One credit. Mr. MacDougall, Mr. Reyerson, Mr. Taylor.
- 253f-254w-255s. Advanced Physical Chemistry Laboratory. To accompany or follow any of the advanced courses in physical chemistry. Prerequisite: Course 142. Credits arranged. Mr. MacDougall.

TECHNOLOGICAL CHEMISTRY

- 161f-162w-163s. Food Analysis. Prerequisite: Course 21. Three credits per quarter. Lect. T IV; 215C. Lab. F II-III, VI-IX; 217C. Mr. Harding.
- 164w. Exact Gas Analysis. Prerequisite: Course 21. One or two credits. Mr. Harding.
- 166s. 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.
- 167f. Gas and Fuel Analysis. The chemical analysis and colorimetry of solid and gaseous fuels and methods of testing municipal gas. Prerequisite: Course 21. Three credits. Lect. S I; 215C. Lab. TTh I-III; 10C, or Th VI-VIII, S II-IV; 10C. Mr. Harding.
- 168w. Petroleum and Petroleum Products. Examination and testing principally of gasoline, illuminating and lubricating oils. Prerequisite: Course 21. Three credits. Lect. S I; 111C. Lab. TTh I-III; 10C, or Th VI-VIII; S II-IV; 10C. Mr. Harding.
- 169f,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: Course 21. One, two, or three credits. Lect. Th II; 215C. Lab. TS I-III; 217C. Mr. Harding.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 301f-302w-303s. Research Work in Inorganic Chemistry. Credits to be arranged. Mr. Sneed, Mr. Reyerson.
- 321f-322w-323s. Research Work in Analytical Chemistry. Credits to be arranged. Mr. Brinton, Mr. Geiger.
- 331f-332w-333s. Research Work in Organic Chemistry. Credits to be arranged. Mr. Hunter, Mr. Frankforter, Mr. Lauer, Mr. Smith.
- 341f-242w-343s. Research Work in Physical Chemistry. Including work in electrochemistry and colloids. Credits to be arranged. Mr. MacDougall, Mr. Reyerson, Mr. Taylor.
- 361f-362w-363s. Research Work in Technological Chemistry. Credits to be arranged. Mr. Harding.

CHEMICAL ENGINEERING

Professors Charles A. Mann, George B. Frankforter; Assistant Professors George H. Montillon, 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, Courses 140f-141w-142s, or their equivalent.

For the requirements for the professional degree of chemical engineer, see page 17.

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

- 171s. Chemical Machinery. Principles and materials of construction, operation, and uses of chemical machinery. Lectures and recitations. Laboratory work in operating and testing. Visits to chemical plants. Prerequisites: Courses 21, 36. Four credits. MTWThF I; 111C. Mr. Mann.

- 172f. Industrial Inorganic Chemistry. Operations common to chemical industries, marketing of products, utilization of by-products, trade journals. Lectures and recitations. Prerequisite: Course 171. Four credits. MTWThF I; 111C. Mr. Mann.
- 173w. Industrial Organic Chemistry. Similar to above but covering organic fields. Lectures and recitations. Prerequisite: Course 172. Four credits. MTWThF I; 111C. Mr. Mann.
- 174f. Chemical Manufacture (Inorganic). Manufacture of technical products on a scale large enough to afford data for the determination of cost of manufacture. Use of semi-plant scale equipment and technical trade journals. Laboratory. Prerequisite: Course 171. Two or more credits. Lab. T I-IX or Th I-IX; 90C. Mr. Montonna.
- 175w. Chemical Manufacture (Organic). Similar to above but covering the organic field. Laboratory. Prerequisite: Course 171. Two or more credits. Lab. T or Th I-IX; 90C. Mr. Montonna.
- 176f-177w. Applied Electrochemistry. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, batteries, electro-plating, electric furnace construction and operation, and electrolytic and electric furnace products. Prerequisite: Course 142. Four credits per quarter. Lect. MWF III; 111C. Lab. Th VI-VIII. Mr. Montillon.
- 178s. Chemical Engineering Calculations. Problems in drying, evaporation, filtration, and general chemical processes. Prerequisite: Course 173. Three credits. Lect. MWF III; 111C. Mr. Montillon, Mr. Montonna.
- 179s. Advanced Applied Electrochemistry. The more recent developments in this field. Prerequisites: Courses 142, 176, 177. Four credits. Mr. Mann, Mr. Montillon.
- 180f-181w-182s. Design of Chemical Equipment and Plants. Based on collected data on the subject. Classroom and laboratory work. Prerequisite: Course 173. Two credits per quarter. MF VI-VIII. Mr. Montillon.
- 183f. Chemistry of Explosives. History, development, manufacture, and uses. Lectures, required reading, and reports. Prerequisite: Course 173. Four credits. (Not given in 1925-26.) Mr. Frankforter.
- 184s. Organic Dyestuffs. The technical chemistry of commercial dyes and their intermediates. Class and laboratory. Prerequisite: Course 173. Five credits. Mr. Frankforter.
- 185s. Advanced Chemical Manufacture. Problems in the manufacture of special chemicals on a large scale, using the industrial chemistry laboratory. Prerequisites: Courses 174, 175. Three credits. Mr. Montonna.
- 186s. Gas Manufacture and Distribution. Prerequisites: Courses 21, 27. Three credits. Mr. Montillon.
- 188w. 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: 37 or equivalent. Three credits. Hours ar. Mr. Montonna.

271f-272w-273s. Seminar. Presentation and discussion of papers concerning the newer developments in chemical industries. One credit. Mr. Mann, Mr. Montillon, Mr. Montonna.

COURSES PRIMARILY FOR GRADUATE STUDENTS

371f-372w-373s. Research Work in Chemical Engineering; Industrial Inorganic and Industrial Organic Chemistry; or Applied Electrochemistry, Electric Furnace Work, and Chemical Manufacture. Credits as. Mr. Frankforter, Mr. Mann, Mr. Montillon, Mr. Montonna.

CIVIL ENGINEERING

Professors Frederic H. Bass, Alvin S. Cutler, Frederick M. Mann, John I. Parcel, Frank B. Rowley; Assistant Professors Fred C. Lang, George A. Maney.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

For prerequisites see bulletin of College of Engineering and Architecture.

- 121f. Railway Engineering. Design and construction of railroad buildings and 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. Signalling 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. Mr. Maney.
- 132w. Bridge Design. Design and detail drawing of railway plate girder viaduct. Three credits. Mr. Maney.
- 133s. Bridge Design. Complete design and detail drawing of railway pin truss span. Three credits. Mr. Maney.
- 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, Mr. Maney.
- 146f,w,s. Cement and Concrete Laboratory. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. Three credits. Mr. Lagaard.
- 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. Mr. Maney, Mr. Lagaard.
- 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. Mr. Maney, Mr. Lagaard.
- 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, Mr. Maney, Mr. Lagaard.

COMPARATIVE LITERATURE

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.

COMPARATIVE PHILOLOGY

Professor Frederick Klaeber; Associate Professor Samuel Kroesch.

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

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w. General Introduction to the Science of Language. Prerequisite, one of the following groups: (1) five years' foreign language, four may be in high school and one in college; (2) two years' foreign language. 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 to be arranged. Mr. Kroesch.
- 109f-110w-111s. History of the German Language. Identical with German 109-110-111. Nine credits. Hours to be arranged. Mr. Klaeber.
- 141f-142w-143s. Historical Grammar of the English Language. I. Sounds and spelling. II. Accidence and syntax. Nine credits. Hours to be 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; 210HH. 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.
- 104f. 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; 210HH. 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 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. Prerequisite Dairy Husbandry 2 or equivalent, Dairy Husbandry 111 or 112. Investigations of specific problems in the bacteriology of milk and dairy products. Ar. Mr. Macy.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201w,s. Dairy Bacteriology. Lectures, assignments, laboratory work. Types of milk organisms, relation of the bacteria of milk to dairy manufactures and to public health, the bacteriology of dairy products. Winter, MWF VI, VII, VIII; Spring, MWF I, II, III; 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 George W. Dowrie, John D. Black, Roy G. Blakey, Frederic B. Garver, Norman S. B. Gras, Alvin H. Hansen, Bruce D. Mudgett; Associate Professors Ernest A. Heilman, H. Bruce Price, Clare L.

Rotzel, J. Warren Stehman, Roland S. Vaile, Holbrook Working; Assistant Professors Walter R. Myers, John J. Reighard, Warren C. Waite; Professorial Lecturer J. Franklin Ebersole.

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

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.

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.

A. 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, Police Power; 158, Government and Business; 159, Law of Public Utilities.

- 103f-104w. Value and Distribution. Six credits. VII; MWF; 102B. Mr. Garver, Mr. Waite.
- 105s. History of Economic Ideas. The classical economists. Three credits. (Not offered in 1925-26.) Mr. Garver.
- 106s. History of Economic Ideas. The critics of the classical economists. Three credits. MWF IV; 202B. Mr. Hansen.
- 112f. Business Statistics. Three credits. MWF I; 6B. Mr. Mudgett, Mrs. Kittredge.
- 113w-114s. Theory of Statistics. Six credits. MWF I; 6B. Mr. Mudgett, Mrs. Kittredge.
- 130f. Cost Accounting. General Survey. Three credits. TThS III; 6B. 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.
- 143f-144w, 143w-144s. The Financial System. Eight credits. Fall to winter. Lecture W III; MuAud. (1) MTW VIII; 209B. (2) MWF II; 106B. (3) MWF II; 102B. (4) TThS II; 106B. (5) TThS III; 209B. (6) TThS III; 202B(f), 109B(w). (7) MWF V; 209B. (8) MWF VI; 209B. Winter to spring. Lecture S IV; 202B. (1) MWF II; 104B(w), 209B(s). (2) MWF IV; 104B. (3) MWF VII; 203B(w), 102B(s). Mr. Dowrie and others.
- 145s. Foreign Exchange. Three credits. MWF IV; 102 B. Mr. Myers.
- 146f. Investments. Three credits. MTW IX; 202B. Mr. Ebersole.
- 147s. Bank Administration. Three credits. MTW IX; 202B. Mr. Ebersole.
- 149w,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. Three credits. Winter, MTW IX; 202B. Spring, MTW VIII; 202B. Mr. Ebersole.
- 150s. Advanced Farm Finance. Three credits. W VI-VII; 104B. Mr. Myers.
- 153w. The Trust Problem. Three credits. MWF II; 202B. Mr. Stehman.

- 154s. Public Utilities. Three credits. MWF II; 102B. Mr. Garver.
- 155s. Corporation Finance. Three credits. Lect. Th III; 301F. (1) MW II; 109B. (2) MW III; 6B. (3) MW III; 202B. (4) MW IV; 209B. (5) TTh VI; 102B. (6) TTh VII; 102B. Mr. Stehman.
- 156f. Advanced Corporation Finance. Three credits. (1) TThS I; 102B. (2) TThS II; 102B.
- 161f,w. Labor Problems and Trade Unionism. Three credits. Fall. Lect. MW IV; 202B. (1) F IV; 202B. (2) F IV; 109B. (3) F II; 213B. Winter. TThS III; 202B. Mr. Hansen.
- 162w. The Labor Movement in America and England. Three credits. MWF IV; 202B. Mr. Hansen. (Not offered in 1925-26.)
- 163w. Economic Aspects of Population and Immigration. Three credits. Mr. Hansen.
- 167w. Personnel Administration. Managerial policy, for various types of organization, on labor. Special attention to job analysis. Employment incentives, and regularization of employment. Three credits. TThS II; 202B. Mr. Hansen, Mr. Stead.
- 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. Three credits. TThS II; 209B. Mr. Hansen, Mr. Stead.
- 169s. The Labor and Socialist Movement in Europe. Three credits. (Not offered in 1925-26.) Mr. Hansen.
- 176f,s. Commercial Policies. Theory of international commerce; free trade reciprocity, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign politics, and other governmental and organized efforts to affect trade. American problems emphasized. Three credits. MWF I; 202B. Mr. Blakey.
- 177w. Foreign Trade. Three credits. MWF I; 202B. Mr. Blakey.
- 180f-181w-182s. Seminars for Seniors and Graduates. Intensive study of problems in respective fields of specialization. In 1925-26 seminars will be offered in the following:

No.	Title	Hour	Day	Building
A.	Accounting	V½-VI	TTh	302B
B.	Business Finance	VII-VIII	T	213B
C.	Marketing	VI-VII½	TTh	104B

- 191f-192w. Public Finance. Six credits. (1) MWF III; 209B. (2) MWF IV; 209B. Mr. Blakey.
- 193s. State and Local Taxation. Three credits. MWF III; 209B. Mr. Blakey.

COURSES FOR GRADUATE STUDENTS

- 203f-204w-205s. Seminar in Economic Theory. Intensive study of a limited field in economic theory. Individual investigation, reports, and group discussion. Nine credits. TTh VIII½-IX; 104B. Mr. Garver.
- 210f-211w-212s. Seminar in Labor. Nine credits. Ar. Mr. Hansen.
- 243f-244w-245s. Seminar in Private Finance. Six credits. M VIII-IX; 104B. Mr. Dowrie.

B. AGRICULTURAL ECONOMICS

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 110f-111w. Economics of Agricultural Production. Six credits. TThS I; 1PP. Mr. Black.
- 126s. Economics of Consumption. Three credits. MWF I; 4PP. MWF IV; 4PP. Mr. Waite.
- 130f. Prices of Farm Products. Three credits. TThS II. Mr. Working.
- 131w. Market Prices. Three credits. TThS III. Mr. Waite.
- 135s. Methods of Forecasting Prices. Three credits. TThS III. Mr. Working.
- 140f. Principles of Marketing Organization. Three credits. MWF I. Mr. Price.
- 140s. Principles of Marketing Organization. Three credits. TThS II. Mr. Price.
- 141w. Marketing Organization: Semi-Perishables. Three credits. TThS II. Mr. Price, Mr. Gaumnitz.
- 142s. Marketing Organization: Perishables. Three credits. MWF III. Mr. Price, Mr. Holt.
- 145w-146s.¹ Marketing Management. Three credits. MWF IV; 102B. Mr. Gaumnitz, Mr. Holt.
- 147s. Marketing Accounting. Three credits. TThS II. Mr. Price, Mr. Holt.
- 151f,s. Seminar in Transportation of Farm Products. Three credits. Ar.
- 160s.¹ Advanced Farm Finance. Three credits. F VI-VII. Mr. Myers.
- 170s.¹ Land Economics. Three credits. TTh VII-VIII½; 202B. Mr. Black.
- 171w. Land Tenure. Three credits. MWF III. (Not given in 1925-26.) Mr. Black.
- 190s. Agricultural Statistics. Three credits. TThS III. Mr. Working.

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. Black, Mr. Price, Mr. Working.
- 203f-204w-205s. Seminar in the Current Literature of Agricultural Economics. One credit per quarter. Friday evening. Mr. Black, Mr. Price, Mr. Working.
- 206w. Agricultural Policy. Three credits. MW VI-VII½. Mr. Black.
- 210f. Seminar in Production Economics. Three credits. TTh VI-VII½. Mr. Black.
- 217s. Seminar in Research Methods in Production Economics. Three credits. F VIII-IX. Mr. Black.

¹ These courses are offered on the Minneapolis campus.

220. Seminar in Farm Household Economics. To be arranged. Topics: rural standards of living, cost of living on the farm, administration of farm incomes.
- 230s. Seminar in Prices of Farm Products. Three credits. TTh VI-VII½. Mr. Working.
- 237w. Seminar in Research Methods in Price Analysis. Three credits. F VIII-IX. (Not given in 1925-26.) Mr. Working.
- 240s. Seminar in the Marketing of Cereals. Three credits. MF VI-VII½. (Offered in 1926-27 and in alternative years thereafter.) Mr. Price.
- 241s. Seminar in the Marketing of Livestock and Livestock Products. Three credits. MF VI-VII½. (Offered in 1925-26 and in alternate years thereafter.) Mr. Price, Mr. Gaumnitz.
- 244w. Seminar in Co-operative Marketing. Three credits. TTh VI-VII½. (Offered in 1925-26 and in alternate years thereafter.)
246. Seminar in the Economics of Consumption. To be arranged.
- 247f. Seminar in Research Methods in Marketing. Three credits. (Not offered in 1925-26.) Mr. Price, Mr. Black.
- 265f. Seminar in Agricultural Taxation. Three credits. MW VI-VII½. (Offered in 1925-26 and in alternative years thereafter.)
- 273f. Seminar in Land Values. Three credits. MW VI-VII½. (Offered in 1926-27 and in alternative years thereafter.) Mr. Black.

EDUCATION

Professors Fred Engelhardt, Melvin E. Haggerty, Earl Hudelson, Leonard V. Koos, Wylie B. McNeal, Wilford S. Miller, Charles A. Prosser; 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 6 quarter credits in psychology and in addition to this a total of not less than 18 quarter credits of undergraduate work in education.

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

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

NOTE.—Candidates for the university 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. 7:30-9:30 p.m. Monday.

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.
- 115f,w,s. Practice in Supervision. Problems and practice in the supervision of instruction in the elementary schools of Minneapolis and St. Paul. Three 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: 1, 3. Three credits. MWF I. Ar. 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; 205Ed. 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, 111. Six credits. MWF IX; 205Ed. 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. S I, II. Mr. Peik.

- 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. Prereq., Ed. 124-125-126 or equivalent. One credit. Ar. Mr. Engelhardt.
- 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: 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. Brueckner.
- 161bf. 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. Prerequisite: Ed. 15 or equivalent. Two credits. W VIII, IX. Ar. Mr. Peik.
- 162as. 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. Ar. Brueckner.
- 162b. Supervision of Social Sciences in the Elementary Schools. The scientific work being done on the course of study; in geography, history, science, and related fields; improvement of instruction in social sciences in the elementary schools. (Not offered in 1925-26.)
- 162c. 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. (Not offered in 1925-26.)
- 164w. High School Administration. A study of elimination from school, secondary vocational education, the marking system, classification of students, high school library, social organization and extra-curricular activities, community relationships, teaching schedule, building, costs. Prerequisite: 10 hrs. in education, including Ed. 55. Three credits. MTTh VIII. Ar. Mr. Koos.
- 167w-168s. Junior High School. A study of the special purposes of this institution and the appropriate reorganizations to achieve them; the history of the movement. Prerequisites: 10 hrs. in education, including Ed. 55. Four credits. W IX, X; Ar.
174. Public School Finance. A critical study of problems of federal and state aid to public schools; sources, methods, principles, needed reforms. Students are strongly advised to take as preparatory or in conjunction with this course Economics 191f-192w, Public Finance, and Education 126-127w, Methods of Educational Research. (Not offered 1925-26.)

- 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.
- 205f-206w-207s. Seminar in Educational Administration. Prerequisites: 124-125-126, 160-161-162. Six credits. Ar. Mr. Engelhardt.
- 215-216-217. Seminar in Public Education in the United States. Research course devoted to intensive study of certain factors determining the problem of public education in the United States. The following may be considered typical problems: school support, school supervision, administrative units. (Not offered in 1925-26.)
- 218f-219w-220s. Seminar in Secondary School Problems. Th IX, X; 111Ed. Mr. Koos.

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. Prerequisite: Agricultural Education 11. Five credits. MTWThF III; 317Ad.F. Mr. Field, Mr. Lathrop.
- 141w,s,su. 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: 11. Three credits. Mr. Field, Mr. Lathrop.
- 151w,s. Organization and Management. Organization and management of work in secondary schools, particularly of Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and co-ordination of work. Prerequisite: Agricultural Education 11, 21. Five credits. MTWFS IV; 317Ad.F. Mr. Storm, Mr. Lathrop.
- 153f,s. Consolidated Rural Schools. To prepare principals to meet the problems peculiar to consolidated rural schools. Prerequisite: Agricultural Education 11. Three credits. Ar. Mr. Dyer.
154. Rural Education and Community Life. The rural school as a community center for educational, social, and recreational work. Prerequisite: Agricultural Education 11. Three credits. Ar. Mr. Dyer.

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: 11, 153, or equivalent. Three credits. Ar. Mr. Dyer.
- 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. Prerequisites: 131, 41, 42. Three credits. Mr. Lathrop, Mr. Field.
- 176s. Problems in Visual Presentation. Based on Course 75. Further work in design and construction of charts and lantern slides. Special study of motion picture machines. Actual practice in effective use of visual aids in lecture and recitation. Prerequisite: 75. Three credits. Ar. Mr. Field.
- 191f-192w-193s. Seminar in Agricultural Education. Individual investigation and research; review and interpretation of current educational literature. Prerequisite: Agricultural Education 11. Two credits each. Mr. Storm, Mr. Field, 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. 209Ad(F). Mr. Storm, Mr. Field, Mr. Lathrop, Mr. Dyer.
- 221f-222w-223s. Graduate Problems. Making investigations, gathering data, and formulating plans regarding agricultural education. Three credits. 209Ad(F). Mr. Storm, Mr. Dyer, Mr. Field, Mr. Lathrop.
- Agri. Educ. 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. Mr. Storm, Mr. Field, Mr. Lathrop.
- Agri. Educ. 242w,243s. 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. Mr. Storm, Mr. Field, Mr. Lathrop.

EDUCATIONAL PSYCHOLOGY

- 106f-107w-108s. Advanced Educational Psychology. Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; study of typical learning experiments. Study of group and individual differences, and their relations to educational practice. Prerequisite: 55 or equivalent. Nine credits. MWF III; Mr. Van Wagenen.

- 111s. Educational Diagnosis. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the tests. Prerequisite: 55 or equivalent. Three credits. MWF II. Mr. Van Wagenen.
- 111Tf-112Tw. Educational Diagnosis. Same as above for teachers. Four credits. S I, II. Mr. Van Wagenen.
- 116af. Elementary Statistical Methods. Designed to supply the immediate statistical technique necessary for the pursuit of studies in education.
- 116f. Statistical Methods in Education. A study of statistical methods as applied to educational investigation. This course or 116a is ordinarily required of all candidates for advanced degrees. Two credits. T IX, X. Mr. Van Wagenen.
- 117w-118s. 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. Prerequisite: 116. Four credits. T IX, X. Mr. Van Wagenen.
- 130s. Vocational Psychology. Methods of judging vocational interests and aptitudes, psychological analysis of learning or the acquisition of skill, transfer of training, motives and incentives. Intended for students especially interested in vocational and industrial education and training. Prerequisite: Psych. 1, 2, or 6. Two credits. F IX, X. Mr. Paterson.
- 134f-135w-136s. Mental Tests and Mental Diagnosis. Study of mental variation in children, its nature, degrees, causes, and effects. A laboratory course in the study of individual differences by means of individual and group mental tests. A critical study of group tests. Technique of classification of students by means of mental tests. Prerequisite: 55 or equiv. Six credits. MW VII, VIII. Mr. Miller.
- 138w-139s. Experimental Educational Psychology. A laboratory course designed to train students in the use of experimental methods in the study of educational problems, particularly in the field of the psychology of learning. It is suggested that this course supplement either 191w or 106-107-108. Prerequisite: 55. Four credits. WF IX, X. Mr. Rockwell.
- 143f-144w-145s. Individual Mental Examination. For teachers of sub-normal 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. Prerequisite: 55. Six credits. S I, II.
- 149f-150w-151s. 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. Prerequisite: Ed. 134-135-136 or equivalent. Two to six credits. MWF 2:00-4:00.

- 153f-154w-155s. Research Problems. Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology. Ar. Mr. Haggerty, Mr. Miller, Mr. Van Wagenen.
- 184f-185w-186s. Mental Deficiency. Survey of mental deficiency in children and adults. Physical traits, including study of brain defects, causes and heredity; psychology of mental deficiency; social problems of feeble-mindedness. Subjects treated with reference to the training of defectives. Prerequisite: 55. Six credits. S III, IV. Mr. Rockwell.
- 191w. 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. Prerequisite: twelve credits in psychology and educational psychology. Four credits. MTThF III. Mr. Rockwell.
- 192f. The Psychology of Behavior Problems in Children. Prerequisite: fifteen credits in psychology and education. Two credits. S III, IV. Mr. Blanton.
- 193s. Speech Disorders of Public School Children. Prerequisite: fifteen credits in psychology and education. Two credits. S III, IV. Mr. Blanton.
- 197-198-199. Seminar: Problems of Subnormality. Phases of subnormality studied intensively. Review of important literature and original investigation. Students required to make reports on assigned topics and submit a paper on some problem at the close of the quarter. (Not offered in 1925-26.)
- 201-202-203. Seminar in Educational Psychology. A research course for graduate students. Required of all students writing theses in educational psychology. Does not carry credit as course work. M IX, X. Mr. Haggerty, Mr. Miller, Mr. Rockwell, Mr. Van Wagenen.

HISTORY AND PHILOSOPHY OF EDUCATION

- 101f. Foundations of Modern Education. Historical analysis and interpretation of the more important elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance. Prerequisite: six credits in psychology and six credits in history. Three credits. MWF VIII; 208OL. Miss Alexander.
- 102w. History of Modern Secondary and Higher Education. A survey of existing types of American and European secondary and higher schools, followed by a historical study of their origin, aims, growth. Prerequisites: six credits in psychology and six credits in history. Three credits. MWF VIII; 208OL. Miss Alexander.
- 103s. History of Modern Elementary Education. The institutions, theories, and problems of modern elementary education in the light of their history. Emphasis upon the rise of state systems and upon the history of modern educational reform. Prerequisites: six credits in psychology and six credits in history. Three credits. MWF VI; 208OL. Miss Alexander.

114. Philosophy of Education. A discussion of philosophically formulated ideals of education with an attempt to reach a positive philosophy of educational values. (Not offered in 1925-26.)
- 129-130. Educational Classics. An intensive study of selected writings of educational leaders; first quarter, Plato, Aristotle, Quintilian, Comenius, Locke; second quarter, Rousseau, Pestalozzi, Herbart, Froebel, and Dewey. Students may register for either quarter. (Not offered in 1925-26.)
- 131-132. Comparative School Systems. A survey of the existing school systems of France, England, Germany, Denmark. Emphasis upon present problems. Special reference to educational conditions in the United States. Students may register for either quarter. (Not offered in 1925-26.)
- 187f-188w-189s. Seminar in Educational Sociology. The sociological foundations of educational theory will be discussed, with the investigation of specific problems. Prerequisite: Ed. 1 or 101-102-103 and 3. Six credits. S I, II; 206OL. Mr. Finney.
- 211-212-213. Seminar in History of Education. Historical investigation of educational problems. Designed to train students in methods of historical investigations; problems to be selected somewhat upon the basis of student's interest. (Not offered in 1925-26.)

HOME ECONOMICS EDUCATION

Professor Wylle B. McNeal.

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,s. Home Economics Problems in Vocational Education. 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 ar. Miss McNeal, Miss Brown.
- 142s. 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 ar. Miss Brown.
- 242f,w,s. Home Economics Education Seminar. Current problems in home economics education will be studied. Required of all candidates majoring in home economics education. One credit. Hours and days ar. Miss McNeal, Miss Brown.

THEORY AND PRACTICE OF TEACHING

118. Problems in Junior High School English. Study of the problems in teaching, reading, literature, and composition in upper grammar grades and junior high schools. (Not offered in 1925-26.)

- 193f. 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 VIII. 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.
- 222f-223w-224s. Research Problems in Secondary Education. Prerequisite: Ed. 15 and 113. Two credits. Ar. Mr. Hudelson.
- 225f-226w-227s. Seminar in Elementary School Problems. T IX, X. Ar. Mr. Brueckner.

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; 210OL. 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. Craigo.
- 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: 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: 172. Two credits. M IX, X; 210OL. Mr. Prosser.

ELECTRICAL ENGINEERING

Professors George D. Shepardson, Frank W. Springer, William T. Ryan;
Assistant Professors Cyril M. Jansky, Jr., John H. Kuhlmann.

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

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.
- 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. Springer.
- 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. Prerequisites: 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. Prerequisites: Electrical Engineering 128. Two credits. Mr. Jansky.
- 132f-134w-136s. Electrical Design. Prerequisite: Electrical Engineering 115. To be taken with Course 121-123-125. Two credits per quarter. Mr. Kuhlmann.
- 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.
- 145s. Steam Railroad Electrification. Prerequisite: Electrical Engineering 144. Two credits. MW 11:30.
- 151f. Electric Lighting. Lectures, problems, and laboratory practice. Prerequisite: one year in college physics. One credit.

- 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.
- 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. Shepardson, Mr. Swenson.
- 165w-166s. Telegraph and Telephone Circuits. Theoretical and experimental study of telegraph and telephone circuits and the phenomena of long line transmission. Prerequisite: Course 164. Two credits per quarter. Mr. Shepardson, 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.
- 183f-184w-185s. Electrical Laboratory. Efficiency tests and special problems. Prerequisite: Electrical Engineering 126. Credits as arranged. Mr. Shepardson, 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.
- 191f-192w-193s. Journal-Reading. Weekly discussion of current electrical periodicals. Prerequisite: Electrical Engineering 115 or equivalent. No graduate credit. Mr. Shepardson.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 232f-234w-236s. Electrical Design. Special problems. Prerequisites: Electrical Engineering, 125, 136. Credits as arranged. Mr. Ryan, 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.
- 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. Shepardson.
- 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. Springer.
- 275f-276w-277s. Electrical Engineering Research. Investigation of special problems in laboratory or library. Prerequisite: Electrical Engineering 126. Two to four credits per quarter. Mr. Shepardson, Mr. Springer, Mr. Ryan, Mr. Jansky, Mr. Kuhlmann.
- 291f-292w-293s. Graduate Seminar. Discussions of problems and results of research work. One credit per quarter. Mr. Shepardson, Mr. Jansky.
- 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.IIIS. 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.I24w. 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. Mr. Shepardson and non-resident lecturers. (Not offered in 1925-26.)

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors Royal N. Chapman, William A. Riley, Arthur G. Ruggles, Frederic L. Washburn; Assistant Professors Samuel A. Graham, Oscar W. Oestlund.

Prerequisites.—Eighteen credits in animal biology and entomology.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 117f-118w-119s. General Ecology of Insects. General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work. 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. Mr. Oestlund.
- 130w. Biology and Taxonomy of the Aphididae. Intensive study of the natural history, bibliography, and classification of the Aphididae. Additional work is offered under Course 175. MWF III, IV; 208-210AB. Mr. Oestlund.
- 139-140. History and Development of Insects. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. Individual work along these lines is available to properly qualified students under Course 197. TTh II-IV, and ar.; 211AB(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.
- 150su. Insecticides and Their Action. Ar.; Insectary (F).
- 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. Washburn, economic vertebrate zoology, insecticides; Mr. Oestlund, systematic entomology.

COURSES PRIMARILY FOR GRADUATE STUDENTS

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

EXPERIMENTAL ENGINEERING

Professors Frank B. Rowley, William E. Brooke, John J. Flather, William F. Holman; Associate Professors Jacob O. Jones, Fred C. Lang, Charles F. Shoop; Assistant Professors Maurice B. Lagaard, George A. Maney, George C. Priester, Burton J. Robertson.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- M.M.141f,w,s. Materials-Testing Laboratory. Investigation of the physical properties of various metals and engineering materials. One credit. Mr. Brooke, Mr. Holman, Mr. Priester.
- M.M.143f,w,s. Hydraulic Laboratory. Experimental and demonstrational work. One credit. Mr. Jones.
- M.M.192w. Hydraulic Motors Laboratory. An experimental study of the characteristics of the hydraulic ram, centrifugal pump, reaction turbine, and impulse wheel. Three credits. Mr. Jones.
- M.M.193s. Hydraulic Measurements. A detailed study of the current meter, Venturi meter, weir, orifice, traveling screen, chemical method of gaging, etc. Three credits. Mr. Jones.
- M.E.181w. Advanced General Laboratory. Indicator practice, valve-setting, separating and throttling calorimeters, tests of steam engines, gas engines, pumps, air compressors, blowers, turbines, boilers, and power plant. (Senior mines.) Four actual hours. Mr. Rowley, Mr. Shoop.
- M.E.182f. Advanced Steam Laboratory. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compounds and triple expansion engines, condensers, superheaters, and boilers. Two credits. Mr. Shoop.
- M.E.183w. Power and Gas Engine Laboratory. Tests of gas, gasoline, and hot air engines, gas producers. Power and lighting plants. Two credits. Mr. Rowley, Mr. Robertson.
- M.E.184s. Advanced Engineering Laboratory. Opportunity will be offered for carrying on investigations in connection with tests of complete power plants, refrigerators, air compressors, blowers and fans. Also automobile testing and gas engine investigations. Two credits. Mr. Rowley, Mr. Shoop, Mr. Robertson.
- C.E.146f,w,s. Cement and Concrete Laboratory. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. Three credits. Prerequisite: M.M.141. Mr. Lagaard.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- C.E.237w-238s. Structural Laboratory. Similar to Course 243, but dealing mainly with experimental problems in structural steel. Mr. Lagaard, Mr. Maney.
- C.E.243w-244s. Cement and Concrete Laboratory. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. Mr. Lagaard.
- 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. Flather, Mr. Shoop, Mr. Robertson.

ENGLISH

Professors Joseph M. Thomas, Joseph W. Beach, Frederick Klaeber (Comparative Philology), Cecil A. Moore, Frank M. Rarig, Elmer E. Stoll; Associate Professor Martin B. Ruud; Assistant Professors Muriel B. Carr, Charles W. Nichols, Emerson G. Sutcliffe,¹ Cortlandt van Winkle.

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 M.A. or the Ph.D. degree must have given evidence to the department that he speaks and writes English with propriety.

REQUIREMENT FOR MASTER OF ARTS DEGREE

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

If English is offered as a minor, not less than 27 credit hours in the subject.

2. A candidate is not permitted to count toward the degree more than one course running through the year (or its equivalent) the primary purpose of which is practice in writing.

REQUIREMENTS FOR DOCTOR OF PHILOSOPHY DEGREE

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 final 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.

¹ Absent on leave, 1925-26.

COURSES IN ENGLISH

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. Introduction to Middle English. An outline of Middle English grammar, including the interpretation of selected texts. Prerequisites: English 6 and 50. Two credits. TTh VI; 217F. Mr. Klæber.
- 103s. Beowulf. An introduction to the Old English poem, with reading of considerable portions of the text. Prerequisites: either Course 6 or 8 and 50. Three credits. MWF VI; 217F. Mr. Klæber.
- 105w-106s.† Eighteenth-Century Poetry. From Pope to Burns, with special reference to the rise and growth of romanticism. Prerequisites: Courses 6 and 8 or either 6 or 8 and one other course numbered above 5. Six credits. MWF VII; 205F. Mr. Moore.
- 107w-108s.† Eighteenth-Century Prose. Special study of fiction and the essay. Prerequisites: Courses 6 and 8 or either 6 or 8 and one other course numbered above 5. Six credits. MWF VII; 204F. (Not given in 1925-26.) Mr. Moore.
- 109f-110w.† The Romantic Poets of the Nineteenth Century. From Wordsworth to Keats. Prerequisites: Courses 6 and 8 or either 6 or 8 and one other course numbered above 5. Six credits. TThS III; 204F. Mr. Beach.
- 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. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Six credits. MWF III; 204F. Mr. Moore.
- 123f-124w-125s.† The Technique of the Novel. Special studies in novels of the late nineteenth and twentieth centuries, with particular regard to structure. In 1925-26, Meredith, George Moore, Conrad, and Galsworthy. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Nine credits. T 4:00 to 6:00 p.m.; 204F. Mr. Beach.
- 129s. Modern Drama. Contemporary drama from 1870 to the present. Prerequisites: Course 8 and one other course numbered above 5. Four credits. MWThF II; 321F.
- 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. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Three credits. MWF III; 205F. 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: Grade of B in English 8. Four credits. TThFS I; 205F. Mr. Stoll.
- 140s. Advanced Chaucer. The more important poems (except those read in Course 6). The treatment will be primarily literary and historical, linguistic proficiency being presumed. Prerequisites: Course 6 and one other course numbered above 5 (or 6 with a grade of B). Four credits. TWThS II; 205F. Mr. Ruud.

- 141f-142w-143s. Historical Grammar of the English Language. This course is identical with Comparative Philology 141-142-143. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Six credits. Mr. Klaeber.
- 146f-147w. The Metrical Romances. The more important Middle English romances of the non-Arthurian cycles. Prerequisites: Course 6 and one other course numbered above 5. Six credits. MWF VII; 205F. (Not given in 1925-26.)
- 148f-149w. Arthurian Romances. An introduction to the great stories of love and chivalry connected with King Arthur and the Round Table. Prerequisites: Course 6 and one other course numbered above 5. Six credits. MWF VIII; 205F.
- 150f. Victorian Poetry. The poetry of the Victorian era, aside from Browning's and Tennyson's. The principal names are: Matthew Arnold, the Rossettis, Fitzgerald, Morris, Swinburne, and Meredith. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. 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. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Four credits. TWThS III; 204F. Mr. Beach.
- 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. Prerequisites: Course 8 and one other course numbered above 5. Six credits. TThS III; 205F.
- 155s. The American Novel. The history of the American novel from the beginning to the present. Prerequisites: Course 6 or 8 and 44-45. Four credits. (Not given in 1925-26.) Mr. Moore.
- 164s. Dante in English. See Italian 164s. Three credits. MWF IV; 203F. Miss Phelps.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f. Old English. Comparative study of Anglo-Saxon (Old English) grammar and reading of prose texts. Once a week, two hours. Three credits. Mr. Klaeber.
- 202w-203s. Old English Poetry. Critical reading of poems. Once a week, two hours. Six credits. Mr. Klaeber.
208. Piers the Plowman. A study of critical problems relating to the text and authorship. Three credits. (Not given in 1925-26.)
- 209f-210w-211s. The Middle English Lyric. (Not given in 1925-26.)
- 213f-214w-215s. Seminary in Eighteenth-Century Drama. Special attention will be given to the rise and progress of sentimental comedy and domestic tragedy. Nine credits. Th 4:00 to 6:00 p.m. Mr. Moore.
218. Seminary in the Restoration Drama. The drama from the Restoration to the rise of sentimental comedy. Special attention given to the comedy of manners (from Etherege to Farquhar) and its relation to the life of the time. Nine credits. (Not given in 1925-26.) Mr. Stoll.

- 220f-221w-222s. Seminary in Medieval Drama. Nine credits. (Not given in 1925-26.) 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 1925-26.) 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 for religious, social, and political theory. Nine credits. (Not given in 1925-26.) Mr. Moore.
- 231f-232w-233s. Shakespeare's Tragic and Comic Art. Nine credits. M 4 to 6 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. (Not given in 1925-26.) Mr. Ruud.
- 237f-238w-239s. Seminary in Chaucer. A study of some of the important problems in the Chaucer canon and in the works of Chaucer. Nine credits. W 4:00 to 6:00 p.m. Mr. Ruud.
- For courses in Comparative Literature see page 39.

COURSES IN COMPOSITION

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100w-101s.† Versification. The nature of poetry and a detailed analysis of English meters and the various English verse forms. The theory accompanied by criticisms of current poetry and practice in writing verse. Prerequisites: Course 11-12 or 18-19, 20; with or after 9 credits in English poetry. Six credits. (Not given in 1925-26.) Mr. Nichols.
- 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 20. Nine credits. (Not given in 1925-26.) MWF III; 304F. Mr. Sutcliffe.
- 115f-116w-117s. Dramatic Technique. Principles of plotting, characterization, climax, dialog, and scenario-making. Writing of three plays—two original, one dramatized short story. Required readings, laboratory work, criticism of local productions. Open to those who have taken Course 11-12 and have taken or are taking English 129. Nine credits. (Not given in 1925-26.)
- 119f-120w-121s. Seminary 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. Mr. Thomas.

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: Course 11-12 or 18-19 and 9 additional credits in rhetoric. Nine credits. Mr. Thomas.

COURSES IN PUBLIC SPEAKING

- 101f-102w. Advanced Speech Composition. Emphasis on argumentative method, style, psychology of persuasion; study of models. Prerequisites: Course 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 the creative imagination; speech elements in literature; technique governing use of auditory and visual symbols. Collateral readings, speech problems, reports, term papers. Prerequisites: Course 41-42-43 or 45-46. Three credits. MWF III; 308F. Mr. Rarig.

FORESTRY

Professors Edward G. Cheyney, John H. Allison; Associate Professor John P. Wentling.

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

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101w. Advanced Dendrology. A continuation of 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 III; 301Hr. Mr. Wentling.
- 107f. Uses of Wood I. The economic hard and soft woods, both foreign and domestic from standpoint of regions of production, distribution centers, qualities, amounts, and prices in relation to the wood-using industries. Lectures, reading, reports. Prerequisite: 33-34. Three credits. MWF IV; 301Hr. 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, reading, reports. Prerequisite: 33-34. Three credits. MWF IV; 303Hr. Mr. Wentling.
- 109s. Uses of Wood III. The actual use of wood in the industries. At least six hours per week must be spent in actual study in a factory. Complete reports and collateral reading. Prerequisite: 107-108. Three credits. TThS VI, VII, VIII; 303Hr. Mr. Wentling.

- 110f-111w. Mechanical and Physical Properties of Wood. Study of strength as related to density, quality, etc. Wood stresses, failures, and methods of testing timbers. 6 credits. Prerequisites: 33-34. TThS I, II; 203Hr. 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.
- 113w. 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: 33-34, Chem. 3 or 10 and Chem. 36. Ar. 302Hr. Mr. Allison.
- 119f. 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. Prerequisites: Courses 33-34. Three credits. WF VI, VII, VIII; 303Hr. Mr. Wentling.
- 120w. 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 119. Three credits. WF VI, VII, VIII; 303Hr. Mr. Wentling.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202. Research Problems in Science and Practice of Sylviculture. Mr. Wentling, Mr. Cheyney.
- 203-204. Research Problems in Management and Working Plans. Mr. Allison.
- 205-206. Lumber Markets and Prices. Mr. Cheyney.
- 207f-208w-209s. Research in Wood Technology. Mr. Wentling.

GEOGRAPHY

Associate Professor Darrell H. Davis.

Prerequisites.—For major work, Courses 1-2 or 51-52, 61, and 5 additional credits in Geography, Economics 1-2 or 6-7, and Geology 1, or 3 or 29. For minor work, 10 credits in the department.

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

101f,w,s. Research Problems in Geography. Credits and hours to be arranged. Mr. Davis.

GEOLOGY AND MINERALOGY

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

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.
- 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. ar. 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 geological 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. Offered in spring quarter, 1926. Three credits. Mr. Emmons.
- 216s. Geology and Ore Deposits of the Eastern Hemisphere. Prerequisites same as for Course 215. Offered in spring quarter, 1926. 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. Mr. Kroesch.
- 107f. Historical German Grammar. Phonology, inflection, word formation, syntax. Intended primarily for prospective teachers of German. Three credits. (To be given 1926-27.) 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. (To be given 1925-26.) Mr. Klaeber.
- 115-116-117. Middle High German Literature. The Niebelungen Lied, Court Epic, Minnesang. Nine credits. Ar. 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. Mr. Lussky.
- 150f-151w-152s. Die Novelle. A study of the technique and development. Assigned readings and reports. Nine credits. (Offered in 1926-27.) Mr. Burkhard.*
- 153f-154w-155s. Studies in German Literature of the Nineteenth Century. Subject for 1925-26 Austrian Drama. Nine credits. Th VI, VII, VIII; ar. Mr. Burkhard.
- 160f-161w-162s. Lyric Poetry of the Eighteenth and Nineteenth Centuries. Nine credits. M VI, VII, VIII; 209F. (To be given 1926-27.) Mr. Davies.

- 163-164-165. German and English Literary Relations in the Sixteenth, Seventeenth, and Eighteenth Century. Nine credits. M VI, VII, VIII; 211F. (To be given 1925-26.) Mr. Davies.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 225f-226w-227s. Literary Problems. Subject for 1925-26. Schiller. For 1926-27; The Modern German Drama. Nine credits. W 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, William Stearns Davis, Norman Scott Brien Gras, August Charles Krey, Lester Burrell Shippee, Albert Beebe White; Assistant Professors Lawrence Steefel, George M. Stephenson; Professorial Lecturer Samuel B. Harding.

Prerequisites.—Of the four fields in which general survey courses in history are usually given, namely, ancient, American, English, and European, students entering upon graduate work in history will usually be expected to have covered two or three courses, with credit not exceeding 18 hours. For the other 9 hours, they should have a more advanced course in one of these fields and a second course in some field of history in which intensive work is done with the beginnings of investigation. In meeting these requirements consideration will be given to work done from the historical point of view in others of the social sciences, especially political science. The department attaches considerable importance to adequate preparation in the foreign languages, which may be used by the student in the course of advanced and research work. An especially good equipment here will be taken into consideration in weighing the students 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. Four credits. TW VI; 111OL. Mr. Stephenson.
- 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; 218bOL. 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: 20 credits in social science including History 7-8. Three credits. TThS II; 218bOL. Mr. Shippee.
- 144-145.† History of Minnesota. The settlement and development—political, economic, and social—of a typical American commonwealth. Prerequisites: 15 credits in social science including History 7-8. Six credits. (Not offered in 1925-26.)
- 146f-147w.† Constitutional History of the United States. Prerequisites: 15 credits in history or 10 credits in history and 10 in social science including 5 credits in political science. Six credits. MWF IV; 111OL. Mr. Shippee.

- 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. Mr. Harding.
- 152w. Select Topics, West to 1815. Prerequisites: 20 credits in history including 7-8. Five credits. TTh VIII, IX; 328Lib. Mr. Buck.
- 153s. The West in American Politics since 1865. An intensive study of independent parties and radical or progressive political movements. Prerequisites: 20 credits in history including History 7-8. Five credits. TTh VIII, IX; 328Lib. Mr. Buck.
154. Selected Topics in the History of Minnesota. Students taking this course are expected to do a portion of their work in the library of the Minnesota Historical Society. Prerequisites: 20 credits in history including History 7-8. Five credits. (Not offered in 1925-26.) Mr. Buck.
- 155f. United States, 1850-1865. Prerequisites: 20 credits in history including History 7-8. Five credits. WF VIII, IX; 326Lib. Mr. Shippee.
156. The Reconstruction Period. Prerequisites: 20 credits in history, including History 7-8. Five credits. (Not offered in 1925-26.) Mr. Shippee.
- 166f. Selected Topics in the History of Immigration. Prerequisites: 20 credits in history and consent of instructor. Five credits. TTh VIII, IX; ar. Mr. Stephenson.
- 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 the other terms. Nine credits. Ar. Mr. Buck, Mr. Shippee, Mr. Stephenson.
- See also History 113-114-115† under Economic History; History 121 under English History, and History 111 under European History.

ANCIENT HISTORY

- 133f. 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. (Not offered in 1925-26.)
- 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; 104OL. Mr. Cram.
- 105w. History of Rome. Prerequisites: 20 credits in social science group. Five credits. MTThFS III; 104OL. Mr. Cram.

- 134w. Ancient Civilization, Greece. Social and intellectual life of Greece. Prerequisites: 20 credits in history, or a major in Greek or Latin. Three credits. (Not offered in 1925-26.)
- 135s. Ancient Civilization, Rome. Social and intellectual life of Rome. The course will begin with a survey of political history. Prerequisites: 20 credits in history, or a major in Greek or Latin. Three credits. (Not offered in 1925-26.)

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 1925-26.) Mr. Gras.
- 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. Gras.
- 169s. Economic History of the United States since the Civil War. Prerequisites: 20 credits in history or economics, or history and economics combined. Three credits. (Not offered in 1925-26.) Mr. Gras.
- 205-206-207. Seminar in Economic History. Nine credits. Ar. Mr. Gras.

ENGLISH HISTORY

- 109s. English History, 1815-1920. Prerequisites: 20 credits in social science group or 15 in history. Five credits. MTWFS IV; 111OL. Mr. Harding.
- 121w. English Backgrounds and the American Colonies. Prerequisites: 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. TTh VIII-IX; 328Lib. Mr. White.
- 183s. Stuart Period. Prerequisites: 20 credits in history including 4-5. Five credits. MW VIII, IX; 328Lib. 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; 112OL. Mr. Harding.
- 104s. The Near East, Modern. The Saracen Empire, Turkey, the Balkan States, and European diplomacy in the East since the beginning of the Middle Ages. Prerequisites: 20 credits in social science group or 15 credits in history. Five credits. MTThFS III; 104OL. Mr. Steefel.
- 106f-107w-108s. Europe, 1815-1914. Prerequisites: 20 credits in social science including 1-2 or 2-3. 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. Four credits. MTWF VI; 111OL. Mr. Stephenson.
- 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 IV; 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 IV; 112OL. Mr. Krey.
- 127w. Feudal Institutions. Prerequisites: 15 credits in history. (Not offered in 1925-26.)
- 128w. Rise of Nationalism in Europe. A study of the growth of central government and the influences which led to the formation of nations to 1600. Chief attention to France. Prerequisites: 15 credits in history. Five credits. MTWFS IV; 112OL. Mr. Krey.
- 129f-130w.† The Formation and Fall of the Modern Roman Empire. Prerequisites: 20 credits in social science, including 10 credits in history. Six credits. (Not offered in 1925-26.) Mr. Ford.
- 157w-158s. Selected Topics in Nineteenth-Century History. Discussion based on a wide range of reading. Prerequisites: 20 credits in social science including History 101-102, 107-108, or 129-130. A reading knowledge of French or German will be required. Ten credits. TTh VII, VIII; 339Lib. Mr. Ford.
- 164w. Studies in the Crusades. Prerequisites: 20 credits in history; knowledge of at least high school Latin. Five credits. TTh VIII, IX; ar. Mr. Krey.
- 201f-202w-203s. Historical Bibliography and Criticism. Required of candidates for advanced degrees in history who do not present evidence of similar training elsewhere. S I; 328Lib. Mr. Ford, Mr. White, and others.
- 204f-205w-206s. Seminar in Medieval History. Nine credits. Ar. Mr. Gras, Mr. Krey, Mr. White.

HOME ECONOMICS

Professor Wylle B. McNeal; Associate Professors Alice Biester, Marion Weller; Assistant Professors Clara M. Brown, Alice Child, Jane Leichsenring, Ethel Phelps, Lucy A. Studley, Amy P. Morse; Instructors Jessie McMahan, Agnes Kolshorn.

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.

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. Three credits. MW VI, VII; F VI; 203-207HE. Miss Biester, Miss Leichsenring.
- 104f,w,s. Field Work in Nutrition. Laboratory, case, and group work in problems of feeding. Prerequisites: H.E. 103 or parallel. Two credits. Lect. F VII. Lab. ar. 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; winter and spring, TThS I, II; 107HE. Miss Child.
- 106f,w,s. Experimental Cookery. Same as 105 except that additional work will be required. Five credits. Fall, MWF I, II; winter and spring, TThS I, II; 107HE. Miss Child.
- 108f,w. Nutrition II. A study of metabolism including work on tissues, blood, and urine. Prerequisites: H.E. 23. Five credits. Fall, MTWThF I, II; 211, 213HE.; winter, Sec. 1, MTWFS III, IV; Sec. 2, MTWThF I, II; 211, 213HE. Miss Leichsenring, Miss McMahan.
- 109w. Advanced Nutrition. A study of selected quantitative methods applicable to investigations relating to digestion and metabolism. Prerequisites: Agr. Biochem. 2; H.E. 23. Five credits. Lect. ar. Lab. TThS I, II, III; 311HE. Miss McMahan.
- 110s. Special Problems in Dietetics. An intensive study involving assigned readings, discussions, and field work. Prerequisites: H.E. 103. Three credits. Lect. MW VIII; 213HE. Lab., one full afternoon; ar. (Not offered in 1925-26.) Miss Biester, Miss Leichsenring.
- 111f. 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; 107HE. Miss Child.
- 112s. Special Food Problems. Same as 111f. Prerequisites: H.E. 105, Agr. Biochem. 2. Five credits. MTWThF VI, VII; 107HE. Miss Child.
- 122f,s. Advanced Textiles. An intensive study of problems relating to the manufacture and use of textile materials; laboratory studies of fibers, shrinkage and other laundry applications, and physical testing of fabrics. Prerequisites: Textiles 5 cred., Organ. Chemistry 5 or 6

- cred., Principles of Economics 5 cred., or parallel. Three credits. Fall, MWF I, II; spring, MWF VI, VII; 311HE. Miss Phelps.
- 123f,w. Clothing Economics. Consideration of problems in the textile and clothing industries and in marketing of clothing that are of consumer interest; conditions of work and wages; standardization of fabrics and clothing; setting of styles; the clothing budget; textile legislation; hygiene of clothing. Prerequisites: Dressmaking 5 cred., Economics 5 cred. Two credits. TS III; 313HE. 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; 311HE. Miss Phelps.
- 131f,w,s. Home Management: House Planning and Equipment. House plans and kitchen arrangements studied from viewpoint of the homemaker. Study of principles underlying selection and arrangement of house furnishing and equipment, including such subjects as walls, rugs, furniture, hangings, and accessories. Special problems for graduate students. Prerequisites: H.E. 52, 53. Five credits. Fall, MTWFS III, IV; winter, Sec. 1, MTWFS III, IV; Sec. 2, MTWThF VI, VII; spring, MTWThF I, II; 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 parallel. Three credits. Lect. MW VII; 213HE. Lab. one-half day to be arranged. Miss Studley.
- 145w,s. 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. TS IV; M III, IV; 106HE. Miss McFarland.
- 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. MW VIII; Lab. ar.; 213HE. Miss Biester, Miss Leichsenring.
- 181f. Digestion and Metabolism. An intensive study of problems relating to digestion and metabolism involving lectures, readings, and demonstration. Prerequisites: H.E. 23, 108; Physiol. 4. Three credits. MW VII, VIII, IX; 213HE. Miss Leichsenring.
- 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. Three or five credits. Hours and days arranged. Miss McNeal, Miss Biester, Miss Child, 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. Required of all majoring in home economics or minoring in home economics for the Ph.D. degree. One credit. Hours and days arranged. Miss McNeal, Miss Biester, Miss Child, Miss Phelps, Miss Leichsenring.
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. Micro-Analysis of Textile Fibers. Laboratory applications of histological and micro-chemical 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.

HORTICULTURE

Professor William H. Alderman; Associate Professor Wilfrid G. Brierley;
Assistant Professor 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. Prerequisite: 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 credits, or Animal Biology 9 credits. Three credits. ThS I; T III; 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. Advanced Vegetable Production. Reviews and reports on literature, special problems. Prerequisite: Horticulture 32. 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.
- 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.

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, Course 221-222-223 or 211-212-213 and in addition one course each quarter selected from Courses 121-133. The student will be expected to choose for his thesis some problem connected with one of these courses. Besides, a minor is to be carried throughout the year in one of the following departments: Comparative Philology, English, German, Greek, History, Romance Languages, or Scandinavian. For a minor in Latin, Course 211-212-213 or one course each quarter selected from Courses 121-133.

Candidates for the degree of doctor of philosophy in Latin will be expected to spend at least three years in preparation and will carry each quarter in addition to one seminar course and one of the courses listed below, one course in advanced Greek (i.e., in advance of two years of preparatory Greek). A knowledge of Greek and Roman history, Greek

and Roman literature, and a special knowledge of a particular Latin author, or group of authors, will be required. 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. 1.

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. (Offered in 1926-27.) Mr. Pike.
- 123s. Medieval Latin. Selections from ecclesiastical writers, *Itinerarium Regis Ricardi* and selections from Mathew Paris. 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. (Offered in 1926-27.) 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. (Offered in 1926-27.) 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. 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. Mr. Cram.

- 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. Th VIII and IX. (Not offered in 1925-26.) Mr. Pike.
- 221-222-223. Graduate Seminar. Tusculan Disputations of Cicero. Prerequisites: seven years of Latin or any two of Courses 51-73. Nine credits. T VIII and IX; ar. Mr. Pike.
- 211-212-213. Graduate Seminar. Prerequisites: seven years of Latin or any two of Courses 51-73. Nine credits. T VIII IX; ar. (Offered in 1926-27.) Mr. Pike.

MATHEMATICS AND MECHANICS

Professors William E. Brooke, William H. Bussey, Hans H. Dalaker, William L. Hart, William F. Holman, Dunham Jackson, William H. Kirchner, Francis P. Leavenworth (Astronomy); Associate Professors Raymond W. Brink, Jacob O. Jones, Royal R. Shumway, Anthony L. Underhill; Assistant Professor Gladys Gibbens; Assistant Astronomer William O. Beal.

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. Brink.
- 107w-108s. Advanced Calculus. Three credits per quarter. MWF III; 108F. Mr. Brink.
- 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. Mr. Underhill.
- 118f-119w-120s. Vector Analysis. Three credits per quarter. Mr. Jackson.
- 121f-122w-123s. Mathematical Theory of Statistics. Three credits per quarter. (Given in 1926-27.) Mr. Jackson.
- 127f,w,s. Technical Mechanics. Five credits. Mr. Wilcox.
- 128f,w,s. Strength of Materials. Five credits. Mr. Holman.
- 129f,w,s. Hydraulics. Four credits. Mr. Jones.
- 140w. Method of Least Squares. Three credits. (This course is identical with Astronomy 140.) Mr. Leavenworth.
- 150w. Advanced Mathematics for Electrical Engineers. Three credits. Mr. Herrmann.
- 151f-152w-153s. Differential Equations and Advanced Calculus Applied to Engineering Problems. Three credits per quarter. Mr. Dalaker, Mr. Hartig.

* One of the 2 courses 102-103-104, 115-116-117 will be given in 1925-26.

- 154f-155w-156s. Modern Higher Algebra. Three credits per quarter. (Given in 1925-26.) Mr. Dalaker.
- 161f-162w-163s. Advanced Technical Mechanics. Three credits per quarter. Mr. Wilcox.
- 171f-172w-173s. Aerodynamics. Three credits per quarter. Mr. Boehlein.
- 180s. Advanced Strength of Materials. Three credits. Mr. Priester.
- 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

- 206f-207w-208s. Theory of Functions of Real and Complex Variables. Three credits per quarter. (Given in 1925-26.) Mr. Hart.
- 221f-222w-223s. Calculus of Variations. Three credits per quarter. (Not given in 1925-26.) Mr. Underhill.
- 264f-265w-266s. Dynamics of a Rigid Body. Three credits per quarter. Routh, Vol. I. (Given in 1926-27.) Mr. Brooke.
- 274f-275w-276s. Dynamics of a Particle. Three credits per quarter. (Given in 1925-26.) Mr. Brooke.
- 281f-282w-283s. Advanced Theory of Functions. Three credits per quarter. (Not given in 1925-26.) Mr. Jackson.
- 291f-292w-293s. Hydrodynamics. Three credits per quarter. (Given in 1926-27.) Mr. Brooke.
- 294f-295w-296s. Theory of Elasticity. Three credits per quarter. (Given in 1925-26.) 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.

Projective Geometry.

The Mathematics of Small Vibrations.

The Theory of Numbers.

The Calois Theory of Equations.

Higher Plane Curves.

Advanced Differential Equations.

Exterior Ballistics.

The Calculus of Finite Differences.

Modern Theories of Integration.

Theory of Linear Differential and Integral Equations.

Theory of Functions of a Complex Variable. Three credits per quarter throughout the year.

Advanced Descriptive Geometry.

Perspective.

Modern Analysis. (Based on Whittaker and Watson's Text.)

Fourier's Series and Spherical Harmonics.
 Advanced Dynamics. Vol. II. Routh's *Dynamics*.
 Advanced Analytic Geometry of Space.
 Elliptic Functions and Integrals with Applications.
 Advanced Statics.

MECHANICAL ENGINEERING

Professors John J. Flather, Frank B. Rowley, S. Carl Shipley, Charles F. Shoop; Associate Professor John V. Martenis.

INDUSTRIAL ENGINEERING

- 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. Flather.
- 121s. 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.
- 223f. 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. Flather.
- 224w. 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. Three credits. Prerequisite: 223f. Mr. Shipley.
- 225s. 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. Three credits. Prerequisite: 224. Mr. Flather.
- 226f. 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.

- 227w-228s. Industrial Engineering Problems. Special investigations of practical problems and suggested methods of procedure. Lectures, assigned reading, shop visits and reports. Three credits. Prerequisite: 223, 224, 225 or registered in 223, 224, 225. Graduates only. Mr. Flather, 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. Three credits per quarter. Prerequisite: 35. Mr. Flather, Mr. Flodin.

STEAM ENGINEERING

- 135f. Steam Engine Design. Calculations and working drawings for a high speed automatic or Corliss steam engine. Theoretical diagrams, inertia forces; determination of details. Senior option. Three credits. Prerequisite: 42 or equivalent. Mr. Flather, Mr. Campbell.
- 144f. Heat Engines. Elementary thermodynamics. Properties of steam; types and details of steam engines; valve gears; governors; compound engines. Condensers and air pumps. Courses 144, 145, 146 are arranged for students in electrical engineering, and are accompanied by three hours' work in laboratory each week. Three credits. Prerequisite: M.&M. 26. Mr. Shoop, Mr. Rowley, Mr. Robertson.
- 145w. Heat Engines. Continuation of Course 144. Combustion and fuels; boilers, smoke prevention. Selection of engines and boilers. Courses 144, 145, 146 are arranged for students in electrical engineering and are accompanied by three hours' work in the laboratory each week. Three credits. Prerequisite: 144. Mr. Shoop, Mr. Rowley, Mr. Robertson.
- 146s. Heat Engines. Elementary study of steam turbines and gas engines. Courses 144, 145, 146 are arranged for students in electrical engineering and are accompanied by three hours' work in laboratory each week. Three credits. Prerequisite: 145. Mr. Shoop, Mr. Rowley, Mr. Robertson.
- 147w. Heat Engines. Elementary thermodynamics. Properties of steam; calorimeters; pyrometry; types and details of steam engines; valve gears; governors; compound engines. Condensers and pumps. Combustion and fuels; evaporation; steam boilers, smoke prevention. Includes four hours' work in laboratory per week. Four credits. Prerequisite: M.&M. 26. Mr. Shoop, Mr. Tuve.
- 148s. Heat Engines. Elementary study of steam turbines and gas engines; gas producers. Refrigeration. Air compressors. Includes four hours' work in laboratory per week. Three credits. Prerequisite: 147. Mr. Shoop.

- 149f,w,s. Heat Engines. A brief course for students in civil engineering and the course in architectural engineering includes four hours' laboratory per week. Four credits. Prerequisite: M.&M. 26. Mr. Tuve.
- 151s. Thermodynamics. The mechanical theory of heat as applied to steam, oil, gas, and hot air engines and allied power plant machinery and accessory equipment, including compressors, injectors, reheaters, and refrigerating apparatus. Three credits. Prerequisites: M.&M. 127, 128, 129. Mr. Shoop, Mr. Tuve.
- 152w. Steam Turbines. Theory and practice applied to various types. Thermodynamics and mechanical analysis of problems involved in the design of nozzles, blades, rotors, bearings, and governors. Condition of operation; systems of transmission; lubrication; economy; field of service. Laboratory investigation. For seniors. Three credits. Prerequisite: 151. Mr. Shoop.
- 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. Three credits. Prerequisite: M.E. 43. Mr. Shoop.
- 181w. Advanced General Laboratory. Indicator practice, valve-setting, separating and throttling calorimeters, tests of steam engines, gas engines, pumps, air compressors, blowers, turbines, boilers, and power plant. Four actual hours. Prerequisite: 84. Mr. Rowley, Mr. Shoop, Mr. Robertson, Mr. Tuve.
- 182f,w. Advanced Steam Laboratory. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compound and triple expansion engines, condensers, superheaters, and boilers. Two credits. Prerequisite: 151. Mr. Shoop, Mr. Tuve.
- 251f. Advanced Thermodynamics. Expansion of Course 151. Theories of heat as applied to combustion and kinetic engines. Reversible changes of state of wet and superheated vapors. Non-reversible flow and efflux of wet and superheated vapors, throttling through orifices, valves, flow into receivers, communicating vessels. Critical points, liquefaction and mixtures of gases. Gas cycles. Treatment of imperfect gases. Three credits. Prerequisite: 151. Mr. Shoop.

HEATING, VENTILATION, AND REFRIGERATION

- 153f. Heating and Ventilating. Principles of heating and ventilation. Construction and operation of heating apparatus. Furnaces, steam, hot water, vapor, vacuum, and fan systems of heating; ventilation. Lectures, recitations, and designs. For seniors.—Required of senior architectural engineers. Four credits. Prerequisites: M.&M. 127, 128, 129. Mr. Rowley.
- 154s. Heating and Ventilating. Same as Course 153 with the omission of design problems. Arranged for students in the course in Architecture. Two credits. Prerequisite: M.&M. 92. 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, applications to ice-making, cold storage, cooling of air, liquids, and solids. Lectures and recitations. Three credits. Prerequisite: 151. Mr. Shoop.
- 255f,w,s. Advanced Heating and Ventilating. An advanced course for graduates. To be taken in connection with research work in the laboratory, Course 287. Three credits. Prerequisite: 153. Mr. Rowley.
- 257w. Mechanical Equipment of Buildings. Appliances used; heating, ventilating, plumbing systems; piping for fire protection, compressed air, gas, and vacuum cleaning; elevators. Choice of systems. Theory and practice of designing and detailing layouts. Equipment designs for various types of buildings. Three credits. Prerequisite: Phys. 43. Mr. Rowley, Mr. Martenis.

AUTOMOTIVE AND AERONAUTICAL ENGINEERING

- 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. Three credits. Prerequisite: registration in 150. Mr. Robertson, Mr. Hazen.
- 137w. Advanced Gas Engine Design. Continuation of Course 136. Three credits. Prerequisite: 136. Mr. Robertson, Mr. Hazen.
- 141w. Automobile and Motor Truck Engines. Continuation of 150 with special reference to automobile and motor truck engines. Theoretical consideration of engine parts and accessories, carburetion of various fuels; the Diesel principle as applied to small high speed engines. Lectures, recitations, and problems. Three credits. Prerequisite: 150. Mr. Robertson, Mr. Hazen.
- 142s. Automobile and Motor Trucks. Theory and design of the automobile and motor truck chassis, including frames, brackets, clutches, transmission, axles, steering gears, and springs. Lectures, recitations, and problems. Three credits. Prerequisite: 141. Mr. Hazen.
- 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. Three credits. Prerequisites: 41, 43. Mr. Robertson.
- 183f,w. Power and Gas Engine Laboratory. Tests of gas and gasoline engines and gas producers. Power and lighting plants. Two credits. Prerequisite: registration in 150. Mr. Robertson, Mr. Shoop.
- 231f,232w,233s. Automobile and Motor Truck Design. A course covering the 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. Three credits each quarter. Lectures and drawing room work. Graduates only. Mr. Hazen.

- 237s. Gas Tractor Design. Selection of wheel sizes; horsepower weight and drawbar pull. Bearing pressures; ratios and strength of gearing. Details of principal parts. Senior option. Three credits. Prerequisite: 136. Mr. Robertson, Mr. Hazen.
- 293f,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. Three credits. Prerequisite: 150. Mr. Hazen.
- 294f,w,s. Aeroplane Design. Calculations and drawings for a given aeroplane; stability, strength, propulsion, and motive power required. Three credits. Prerequisite: 136.
- 281f,282w,283s. Automobile-Testing and Research. Dynamometer and road tests including overall 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 each quarter. Graduates only. Mr. Robertson.
- 295s. Motor Truck 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. Three credits. Prerequisite: 142.

POWER PLANT ENGINEERING

- 162f. Power Plant Machinery. Advanced study and application of engines, stokers, boilers; coal-handling equipment and accessories. Lectures, recitations. Three credits. Prerequisite: M.E. 43. Mr. Shoop.
- 163w. Power Engineering. Principles of thermodynamics applied to power plant equipment. Three credits. Prerequisite: M.E. 162. Mr. Shoop.
- 164w. Elements of Power Plant Design. Problems in design of power plant elements such as condensers, air pumps, boilers, turbines, piping, and separators. Three credits. Prerequisite: M.E. 163. Mr. Flodin.
- 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. Three credits. Prerequisite: M.&M. 129.
- 265f-266w. Power Plant Design. Problems, designs, and estimates for power plants and central stations. Selection of motive powers, relative advantages of steam and producer gas plants, choice of engines and boilers; pumps, shafting, piping, and accessories. Three credits per quarter. Prerequisite: M.E. 164. Mr. Shoop.
- 267s. Power Plant Management. Operation and maintenance of boilers, engines, gas producers, gas engines, steam turbines, and accessory apparatus. Smoke prevention. Flue gas analysis. Power plant finance. Daily logs and power cost. Three credits. Prerequisite: M.E. 164. Mr. Shoop.

RAILWAY MECHANICAL ENGINEERING

- 271f. Railway Technology. The practical details of construction of locomotives. A systematic course of visits to the various railroad shops in the vicinity. Lectures and recitations. One credit. Prerequisites: M.&M. 127, 128, 129. Mr. Martenis.
- 272f-273w-274s. Railway Design and Locomotive Construction. Locomotive and car details; the locomotive boiler, linkages, and assembled parts. Construction of locomotives: frames, springs, equalizing arrangements, running gear, brakes, trucks, lubrication. Engine details; heat insulation, cylinder proportions. Lectures and assigned reading. Four credits per quarter. Prerequisite: 271, or registration in 271. Mr. Martenis.
- 278s. Locomotive Road Tests. Tests on locomotives and trains. Dynamometer car and drawbar pull. Three credits. Prerequisite: 271, 272. Mr. Flather and assistants.

GENERAL COURSES AND RESEARCH

- 190f-191w-192s. Seminar. Same as Course 93. Arranged for seniors. One credit per quarter. Mr. Flather, Mr. Rowley, Mr. Martenis, Mr. Shipley.
- 290f-291w-292s. Seminar. Same as Course 93. Arranged for graduate students. One credit per quarter. Mr. Flather.
- 184s. Advanced Engineering Laboratory. Opportunity will be offered for carrying on investigations in connection with tests of power plants, refrigerators, air compressors, blowers, and fans. Also automobile-testing and gas engine investigations. Two credits. Prerequisites: 182, 183. Mr. Rowley, Mr. Shoop, Mr. Robertson.
- 287f-288w-289s. Mechanical Engineering Research. Courses may be elected which involve investigations in connection with fuels, lubricating oils, steam and gas engines, heating and ventilating, and other problems as selected. Reports, special problems, and related tests. Three credits per quarter. Prerequisite: 181 or registration in 181. Mr. Flather, Mr. Rowley, Mr. Shoop, Mr. Robertson.

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 systematic disorders. In the Medical School, during at least the third year of the three-year fellowship, the fellow acts as an officer of the clinic with definite responsibility in the care of patients in the University Hospital.

For courses of study see special bulletin of graduate courses in medicine.

METALLOGRAPHY

Professor Oscar E. Harder; Instructor R. L. Dowdell.

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. Harder, Mr. Dowdell.
- 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. Harder, Mr. Dowdell.
- 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. Harder, 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 VI-VIII; 307M. Mr. Harder, Mr. Dowdell, 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 VI-VIII; 307M. Mr. Harder, Mr. Dowdell, 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 alloys 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. Harder, 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. Harder, 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. Harder, Mr. Dowdell, Mr. Weber.
- 163f-164w-165s. Advanced Metallography. Technical and scientific research. The study of steel rails, automobile and locomotive parts, tool steels, etc. Special problems in metallography with outside reading. Seminar work in the recent advances in metallography. Prerequisites: Courses 151, 155, 157, or equivalent. Credits and hours to be arranged. 305M. Mr. Harder.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Advanced Metallography for Graduate Students. Intended primarily for research work. Credits and hours to be arranged. 305M. Mr. Harder.

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 1925-26.) Mr. Swenson.
- 120w. Scandinavian Philosophy. Prerequisite: 10 credits. Three credits. TTh 1:00-3:20; 316F. (Not given in 1925-26.) 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; 338NL. Mr. Swenson.

- 141f-142w. Metaphysics. Prerequisite: 10 credits, including Philosophy 2. Six credits. MWF II; 338NL. Mr. Swenson.
- 147f-148w. Advanced Logic. Prerequisite: 10 credits, including Philosophy 2. Six credits. MWF II; 338NL. (Alternates with 141-142. Not given in 1925-26.) Mr. Swenson.
- 151f-152w. Modern Idealism. Prerequisite: 15 credits. Six credits. MWF VIII; 338NL. (Alternates with 135-136. Not given in 1925-26.) 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, Anthony Zeleny; Associate Professor Louallen F. Miller; Assistant Professors Joseph Valasek, John H. Van Vleck; Instructor 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 evidences 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. Erikson.

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 and simultaneously, if possible, 211-213-215 or 211-248-249. For the Ph.D. degree the sequences, 221-223-205 and 231-233-235 should be added. All the courses have as many lectures per week as credits.

- 205s. Advanced Dynamics. Conservation of momentum; Hamilton's principle; least action; Lagrange's equations; invariance of Hamiltonian form under contact transformations; and other general principles of dynamics; with a brief indication of modifications required by the restricted relativity theory. The principles will be illustrated by the mechanics of small vibrations, the motion of a rigid body, or by applications to atomic structure. Four credits. Mr. Van Vleck.
- 211f. Atomic Structure and Spectral Lines. Radioactivity; scattering experiments; and structure of the nucleus. Photo-electricity. Simple

- Bohr theory of the hydrogen spectrum. Series notation; survey of non-hydrogenic spectra; and qualitative interpretation by an atomic model with two quantum numbers. Bohr's theory of the physical and chemical properties of the elements. Three credits. Mr. Van Vleck, Mr. Buchta.
- 213w-215s. Quantum Theory of Atomic Structure. A continuation of 211f. The correspondence principle. Relativity fine-structure, Zeeman effect, Stark effect. Inner quantum numbers and multiplets. Relative intensities of spectral lines. X-rays. Critical potentials, excitation of spectra, and other topics in Foote and Mohler's *Origin of Spectra*. Infra-red absorption bands. Quantum theories of dispersion. Three credits per quarter. Mr. Van Vleck.
- 221f-233w. Thermodynamics, Statistical Mechanics, Kinetic Theory. Equations of state; first and second laws of thermodynamics; equation of Clapyron; etc. Statistical mechanics, with relation to thermodynamics. Equipartition: Maxwell's distribution of velocities; viscosity; mean free path; theory of specific heats and dissociation equilibrium, with astro-physical applications. Chemical constants; absolute entrophy, and the third law of thermodynamics. Quantum modifications of the classical kinetic theory will be introduced wherever necessary. Three credits per quarter. Mr. Van Vleck.
- 231f. Advanced Optics and Crystallography. Geometrical optics and optical instruments. Interference; diffraction; and polarization; with applications to optical measurements. X-ray analysis; general and characteristic radiation. Crystallographic classification and notation. Analysis of crystal structure by means of X-rays. Four credits. Mr. Valasek.
- 233w. Optical Properties of Materials, Thermal Radiation. Electro-magnetic theories of dispersion; absorption; metallic reflection; crystal optics; optical rotation, magneto- and electro-optics. Thermodynamics applied to the radiation for the black body. Three or four credits. Mr. Valasek.
- 235s. Electrodynamics of Moving Media. Electro-magnetic theory of optical properties of bodies in motion; field equations for moving media. The experiments of Michelson & Morley, Fizeau, Trouton & Noble. Unipolar induction. The Lorentz transformation and introduction to the restricted 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 theorems and processes of analysis applicable to potential theory. Images, spherical harmonics, Fourier series, etc. Four credits. Mr. Van Vleck.
- 243w. Electromagnetism. Magnetic fields; magnetic shells and electric currents; electro-magnetic induction; the circuital relations; the complete current, electro-magnetic waves. The Maxwell-Lorentz equations and their solution; retarded potentials; conservation of energy; energy

- flow; conservation of momentum; radiation from an accelerated electron. Four credits. Mr. Valasek, Mr. Van Vleck.
- 245s. Electrodynamics and Electron Theory. Current flow in continuous media. Large and small scale field equations. Illustration of conservation of momentum by Compton and Doppler effects. Magneto-statics. Dynamical theory of currents. Electro-magnetic mass. Electron theories of conduction. A brief survey of theories of magnetism or introduction to the special theory of relativity will be included if time permits. Three or four credits. Mr. Van Vleck.
- 248w. Thermonics 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.
- 249s. Applied Electricity. Theory of electrical circuits, including radio circuits and filters. Application in various types of electrical apparatus. Applications 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. One hour a week. Open to those who are doing graduate work in physics. Three credits. Mr. Tate.

The following courses will be offered provided at any time there is sufficient demand for them:

Hydrodynamics.

Theory of Elasticity.

Ferro-Magnetic Phenomena and Theories of Magnetism.

Advanced Topics in Electron Theory and the Special Theory of Relativity.

The General Theory of Relativity.

Advanced Quantum Dynamics.

The Partial Differential Equations of Mathematical Physics.

Applications of Vector Analysis to Physical Problems.

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 Agronomy and Farm Management.

PLANT PATHOLOGY AND BOTANY

Professors Edward M. Freeman, Elvin C. Stakman; Assistant Professor Julian G. Leach.

Note.—Four 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. MWF I, II; 1, 2PP. Mr. Freeman, Miss Dossdall.
- 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.
- 110w. Principles of Pathology. Comparative biology 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.
- 111w,su. Diseases of Field Crops. Symptomatology, etiology, and practical methods of control. Laboratory, lecture, and field work. Prerequisite: Course 1 or 10. MWF VI, VII; 1, 2PP. Mr. Stakman, 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 1925-26.) 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 1925-26.) 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 1925-26.) Mr. Stakman, Mr. Leach.

- 116f. Pathological Histology. A study of the histological changes in diseased plants. Lectures, laboratory, and reference work. Three credits. Prerequisites: Course 1 or 10. MWF III, IV; 1, 2PP. Mr. Stakman, Mr. Leach.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 203f-204w-205s. Special Problems. Special assignment of work in laboratory and field problems in pathological research. Mr. Freeman, Mr. Stakman.
- 207f-208w-209s. Research in Mycology. Research work along following suggested lines: taxonomy of natural groups; fungous flora of particular regions, localities, or habitats; investigation of fungi involved in special industrial or natural processes; morphology or physiology of special forms. Prerequisite: Course 105-106-107. For minor or major. Three credits per quarter. Mr. Freeman, Miss Dossdall, Mr. Stakman.
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.

POLITICAL SCIENCE

Professors Cephas D. Allin, William Anderson, Harold S. Quigley, Jeremiah S. Young; Associate Professors John M. Gaus, Morris B. Lambie; Assistant Professor Harold F. Kumm.

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. TThS II; 218OL. Mr. Gaus.
- 105s. Colonization. The economic and political factors in colonization; forms of government, commercial policies, and mandates. (Not offered in 1925-26.)

- 111w-112s. Municipal Powers and Functions. The historical development and present range of municipal activities; problems of police, welfare, education, streets, water supply, sanitation, and public utilities; municipal ownership; city-planning. TThS III; 211OL. Mr. Anderson.
113. Municipal Problems. A specialized course in modern, legal, administrative and functional problems of cities. (Not offered in 1925-26.)
- 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 1925-26.)
- 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 1925-26.)
- 130f. 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. Mr. Gaus.
- 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. MWF II; 209OL. Mr. Lambie.
- 136f-137w. Far Eastern Government and Politics. The constitutional development of Japan and China; government, parties, and political problems. (Not offered in 1925-26.)
- 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; 211OL. 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. MWF I; 221OL. Mr. Kumm.
- 157f. Police Power. Nature of the police power; constitutional aspects of social and economic legislation, including safety, order, morals, and protection against business fraud and oppression; the fundamental rights under the police power. 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; compulsory 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. MWF I; 221OL. Mr. Kumm.
- 161s. Comparative Federal Government. Ancient and modern federal unions. TThS II; 209OL. Mr. Allin.
- 166w-167s. Government and Politics of the British Empire. Organization, working, and international status of the Imperial and Dominion governments. MWF II; 211OL. Mr. Allin.
- 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. (Not offered in 1925-26.)
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, William S. Foster, Karl S. Lashley, Donald G. Paterson; Associate Professor, Herbert Woodrow; Assistant Professor Charles Bird.

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. Foster.
- 108f. Systematic Psychology. A comparative study of the problems, methods, and viewpoints of modern psychology. Three credits. TThS III. 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. 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.
- 121f-122w†-123s. Neuropsychology. The functions of the nervous system in behavior. Neural basis of reflex, instinct, and habit. Physiology of motivation. Individual investigation of special problem in third quarter. One lecture and five laboratory hours per week. Six or nine credits. MWF VII, VIII; 109Psy. Mr. Lashley.
- 124f. Psychology of Learning. Critique of current theories concerning the nature of the learning process. Problems and methods bearing upon the physiology of learning. Not open to students who take Neuropsychology. Three credits. MWF IV; 109Psy. Mr. Lashley.
- 125f-126w.† 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. Six credits. MWF II; 109Psy. Mr. Woodrow.
- 127s. Social Psychology. An examination of the behavior of men in groups, and of some important social institutions, as determined by human motives and traditions. Three credits. MWF II; 109Psy. Mr. Bird.
- 130s. Vocational Psychology. Psychology of individual differences in intelligence, aptitudes, interests, and training, with special reference to vocational guidance. Two credits. F IX, X. Mr. Paterson.
- 144w-145s.† Abnormal Psychology. Systematic review of psychiatry in relation to normal behavior. Types of social maladjustment; delinquency, criminality, fanaticism. Psychology of creative ability. The organization of personality as revealed by studies in psychopathology. Six credits. MWF IV; 109Psy. Mr. Lashley.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 200f-201w.† Seminar in the History of Psychology. Selected topics from the history of psychology. Open to advanced students with permission of the instructor. Three or six credits in proportion to work done. Mr. Foster.
- 205s. Advanced Differential Psychology. Three credits. Mr. Paterson.
- 206-207-208. Research in Animal Behavior.
- 210f-211w-212s. Research Problems. Laboratory investigations. Open to graduate students only. Mr. Elliott, Mr. Foster, Mr. Lashley, Mr. Paterson, Mr. Woodrow.
- 215f-216w-217s.† Seminar in Physiological 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 in the laboratory. Three credits. Alternate Th. 7:15-9:15 p.m. Mr. Lashley.
- 220f-221w-222s.† Journal Club and Seminar. 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.

ROMANCE LANGUAGES

Professors Everett W. Olmsted, Colbert Searles, Irville C. LeCompte; Associate Professors Francis B. Barton, Ruth S. Phelps, 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

- 100w. Diction Française. Etude, théorique et pratique, du français parlé. MWF 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. Reading, discussions and reports. TThS III; 201F. Mr. Searles.
- 118-119-120.† French Literature: Eighteenth Century. Philosophic movement: Bayle, Fontenelle, Montesquieu, Voltaire, l'Encyclopédie, Rousseau. TThS III; 108F. Mr. Sirich.

- 121-122-123.† French Literature: Sixteenth Century. Marot and l'Ecole Lyonnaise. The Renaissance and the Reformation, Rabelais, the Pléiade, and Montaigne. (Not offered in 1925-26.)
- 141s. Realistic Novel: Nineteenth Century. A study of realism with especial reference to the novel. Flaubert, Maupassant, Zola, etc. MTWF VII; 203F. Mr. LeCompte.
- 150-151-152.† French Dramatic Literature. A study of the development of dramatic literature in France from the classical period to the present time. TTh III; 203F. Mr. Olmsted.
- 153s. French Lyric Poetry. Contemporary French Poets. MTWF VI; 212F. Mr. Searles.
- 156w. Molière. MTWF IV; 316F. Mr. Searles.
- 157w. Contemporary French Novel: Bourget, Loti, France, etc. MTWF VI; 217F. Mr. Ditchy.
- 162w. French Romantic Poets. MTWF VII; 203 F. Mr. LeCompte.
- 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; 303F. Mr. LeCompte.
- 174-175-176. Lectures in French. TTh IX; 201F. Mr. Ditchy.
- 191-192-193.† Research Methods and Material. Mr. Krappe.

SPANISH

100. Spanish Oral Diction. Exercises in diction, syntax, and vocabulary. (Not offered in 1925-26.)
- 103-104-105.† Spanish Syntax. Special studies in characteristic problems of Spanish syntax. W VIII; 108F. Mr. Arjona.
- 115-116-117.† Spanish Literature: Seventeenth Century. Alternates with 156-157-158. (Not offered in 1925-26.)
- 141w. Spanish Contemporary Novel. TThFS III; 302F. Mr. Fichter.
- 150s. Spanish Dramatic Literature. Contemporary dramatics. TThFS III; 302F. Mr. Fichter.
- 156-157-158.† Spanish Literature: Sixteenth Century. Alternates with 115-116-117. TS IV; 217F. Mr. Krappe.
- 159s. Cervantes. A study of his life and works. Attention will be centered upon *Don Quixote* and the *Novelas Ejemplares*. (Not offered in 1925-26.)
- 174-175-176. Lectures in Spanish. Subjects to be announced. TTh IX; 202F. Mr. Arjona.

ITALIAN

- 159-160.† Dante. The *Divina Commedia*. (Alternates with 161-162. Not offered in 1925-26.)
- 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; 203F. 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.
- 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. Olmsted.
- 259f-260w-261s. Research in Romance Languages. Credit depends upon amount of work accomplished.

SCANDINAVIAN

Professors Gisle Bothne, Andrew A. Stomberg.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w-103s. Modern Norwegian Literature. 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.
- 117w-118s. Earlier Norwegian Literature. Prerequisite: Scandinavian 102. Five credits. TS III. Mr. Bothne.
- 110w. Ibsen. Prerequisite: Scandinavian 101-102-103. Three credits. Mr. Bothne.
- 111f-112w-113s. Old Norse. (Icelandic). Grammar and reading. Gunnlaug's Saga Ormstungu. Six credits. (Not offered in 1925-26.) TTh V. Mr. Bothne.
- 114f. Strindberg. Prerequisite: Scandinavian 107f-108w-109s. Three credits. Mr. Stomberg.
- 131f-132w-133s. Danish Literature of the Nineteenth Century. From Oehlenschläger to the present time. Nine credits. (Not offered in 1925-26.) Mr. Bothne.

- 134f-135w. The Landsmaal Movement and Literature. From Aasen to Garborg. (Not offered in 1925-26.) Mr. Bothne.
 136s. 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.
 204-205-206. Etymological Studies. 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; Associate Professor Manuel C. Elmer, Wilson D. Wallis (Anthropology); Assistant Professors Ross L. Finney, Gustav A. Lundquist, Mildred D. Mudgett, Edwin L. Clarke; Special 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 evolution of sanctions in social control; the revision of the social controls under the influence of modern science. TThS II; 9F. Mr. Finney.
 103s. Sociology of Conflict. MWF II; 9F. Mr. Clarke.
 110w. Methods of Community Organization and Social Work in Small Towns and Country. Concrete problems and methods are emphasized. Th VIII, IX; 9F. Mr. Elmer.
 112f. The Rural Social Survey. MWF VIII; 9F. Mr. Elmer.
 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.

- 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. Clarke.
- 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. Elmer.
- 126-127. Settlement and Community Center Work. (Not offered in 1925-26.)
- 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.
- 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 1925-26.)
- 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. Th and ar IX; 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 1925-26.)
- 153f-154w-155s. Advanced Field Work. Ar. Ar.
- 158w. The Sociology of Revolution. MWF III; 204F. Mr. Sorokin.

187f-188w-189s. Seminar in Educational Sociology. S I, II; 206OL. Mr. Finney.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 200f-201w-202s. Seminar in Applied Sociology. Mr. Elmer.
 204f-205w-206s. Seminar in Social Theory. Mr. Sorokin.
 206f-207w-208s. Seminar: Statistical Theory in Relation to Social Theory and Practice. T 4-6 p.m.; L12. Mr. Chapin.
 209f-210w-211s. Seminar: The Theory of Social Evolution. Mr. Chapin.
 215f-216w-217s. Seminar in Rural Sociology. Mr. Sorokin.
 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 5 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 1:30-5:20; 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 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.

Bulletin *of the University of* Minnesota

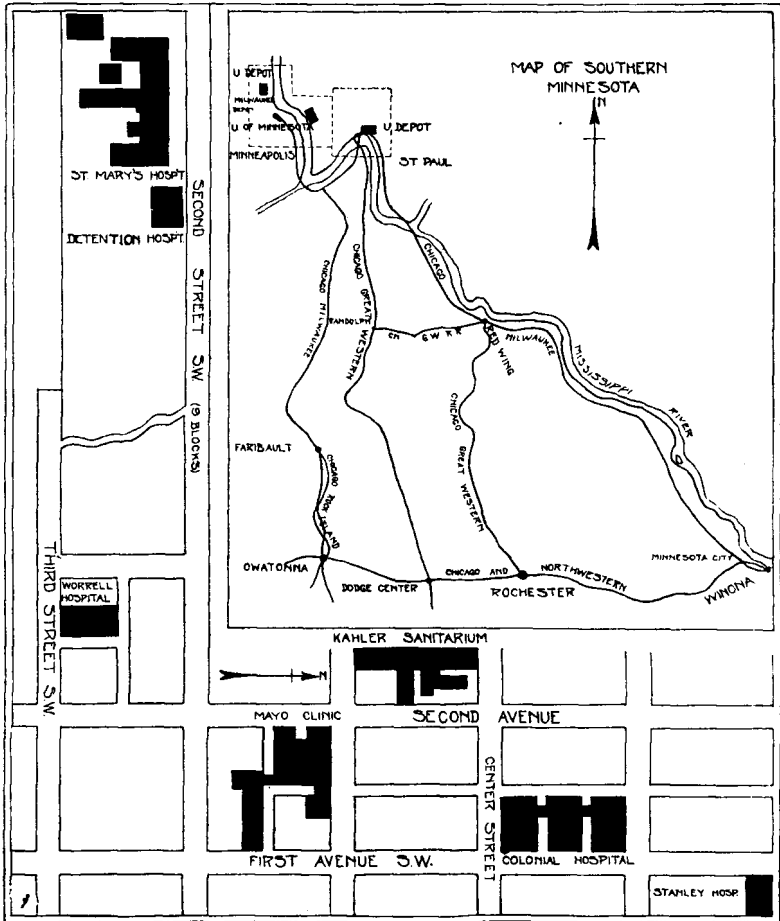
The Graduate School
Announcement of Graduate Work in
Medicine in the Medical School
and the Mayo Foundation
1926-1928



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Map of a portion of Rochester showing clinics and hospitals serving the Mayo Foundation for teaching purposes.

UNIVERSITY CALENDAR

1926-1927

1926

September	20	October 18	Registration of graduate students
September	27	Monday	Fall quarter begins, 8:30* a.m.
October	7	Thursday	Examinations in German and French for candidates for all advanced degrees
November	2	Tuesday	Election Day; a holiday
November	11	Thursday	Armistice Day; a holiday
November	20	Saturday	Last day for filing thesis subject of candidate for the Master's degree
November	25	Thursday	Thanksgiving Day; a holiday
December	16	Thursday	Commencement convocation
December	18	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.

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 thorough 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-

GRADUATE WORK IN MEDICINE

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.
- M253fw,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. Bacteriolysants. 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 Barga, 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. Bargen, 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-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. Chatterton, 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 surgeonsip 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.

M166f,w,s,su. Urologic Diagnosis. Cystoscopic examination and history taking in diseases of the genito-urinary tract. Dr. Braasch, Dr. Crenshaw, Dr. Bumpus.

D167f,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.)

M168f,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.

* Designation used in the directory of the American Medical Association.

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.R. 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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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 M.S. Toronto 19	Ont. 1-16	4- 1-26		Ped.	Path.
Drips, Della Gay	B.A. Wis. 08 M.S. Minn. 17	Minn. 4-20	10- 1-21		Med.	Path.
Dunlap, Harold Foster	B.S. Indiana 16	Ind. 20-20	1- 1-22		Med.	Path.
Dunn, Halbert Louis	B.A. Minn. 17 M.A. Minn. 19 Ph.D. Minn. 23	Minn. 4-22	7- 1-24	8- 1-25	Med.	Path.
Ebert, Joseph Wm.	B.S. Creighton 22	Neb. 6-21	10- 1-22		Med.	Biochem.
Ehrenberg, Claude J.	B.S. Minn. 19 B.M. Minn. 19	Minn. 4-20	9-24-24		Obst. & Gynec.	Anat.
Eitel, George D.	B.S. Minn. 22 B.M. Minn. 23	Minn. 4-24	1- 5-25		Path.	Anat.
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 B.S. Minn. 18	Minn. 4-21	1- 9-25	8- 1-25	Anat.	Ophth.
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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Name	Degrees Other Than Medical and Institutions Conferring Same	Institutions* Con- ferring Medical Degrees	Date of Beginning Graduate Work	Date of Departure	Major	Minor
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. 4-22	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		Ophthalm.	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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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 14	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		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.
Mailer, 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 Willibald	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 Ph.D. Chicago 23	Ill. 1-24	7- 1-25		Med.	Path.
Pederson, Arthur H.	B.S. Minn. 18 M.B. Minn. 20	Minn. 4-21	9-23-22		Anat.	Path.
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 M.S. Path. Minn. Gl. 25	Md. 7-17				
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 2-	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. 25	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	B.S. Col. of Charleston 09	S.C. 1-13	1- 1-20		Ophthal.	Anat.
	M.S. Ophthal. Minn. Gl.—23					
Waller, Riley Moore	A.B. U. of Mo. 18	Mo. 2-20	7- 1-23		Surg.	Path.
Walters, Waltman	B.S. Dartmouth 17	Ill. 1-20	7- 1-20		Surg.	Path.
	M.S. Surg. Minn. Gl. 23					
	B.A. Minn. 19	Minn. 4-22	1-10-23	12-17-25	Med.	Path.
Wangenstein, Owen	B.S. Minn. 20					
	M.B. Minn. 21					
	Ph.D. Minn. 25					
	B.A. Minn. 24		4- 1-24		Anat.	An. Biol.
Watkins, Charles H.	M.A. Minn. 25					
	B.S. Minn. 23		12-11-25		Path.	Med.
	M.B. Minn. 25					
Watson, Cecil J.	M.S. Minn. 25					
	B.S. Bowdoin 16	Maine 1-20	5- 1-23		Surg.	Path.
	M.S. Surg. Minn. Gl.—25					
Webber, Isaac Merwyn	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



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THE SCHOOL OF BUSINESS

FACULTY

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William H. Stead, M.A., Instructor in Economics
W. Bayard Taylor, M.A., Instructor in Economics
Nina Louise Youngs, B.A., Instructor in Accounting
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 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 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 82)
 - 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

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SOPHOMORE YEAR

FALL	Hours	WINTER	Hours	SPRING	Hours
M. & M. 91 Calculus..	4	M. & M. 92 Mechanics..	4	M. & M. 93 Materials..	4
Phys. 3 Mechanics and Sound	3	Phys. 23 Heat.....	3	Phys. 43 Magnetism and Electricity	3
Phys. 4 Mechanics Lab- oratory	1	Phys. 24 Heat Labora- tory	1	Phys. 44 Electrical Lab- oratory	1
Econ. 8 General Eco- nomics	3	Econ. 9 General Eco- nomics	3	Econ. 10 General Eco- nomics	3
M.E. 14 Machine Shop Practice	4	Econ. 25 Principles of Accounting	4	Econ. 26 Principles of Accounting	4
Psy. 1 General Psy- chology	3	Psy. 6 General Psy- chology	3	M.E. 21 Mechanical Technology	1
	—		18	M.E. 41 Automotives..	2
	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; coordination 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

Part II

*Announcement of Program for the Year
1926-1927*



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FRESHMAN WEEK

Every student entering any department of the University for the first time as a freshman in the fall of 1926 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 17, Saturday, September 18, or Monday, September 20, to begin the process of registration. Those coming later than 5:00 p.m. Monday, September 20, will be subject to the usual penalty for late registration. See Penalty Fees, page 50 of the bulletin of general information.

During the week September 21 to 25, 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 17, in order to avoid the inconvenience and delay incident to the congestion on the last day.

UNIVERSITY CALENDAR

1926-27

Fall Quarter

1926			
September	16	Thursday	Payment of fees closes, except for new students
September	16-18		Entrance examinations (for removal of entrance deficiencies)
September	18-20		Registration of all new students entering the freshman class
September	20-24		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	21-25		Freshman week
September	23-24		Registration days ¹ for all colleges not included above
September	24	Friday	Payment of fees for new students closes
September	27	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ³ begin
October	21	Thursday	Senate meeting, 4:30 p.m.
November	11	Thursday	Armistice Day; a holiday
November	20	Saturday	Homecoming Day
November	25	Thursday	Thanksgiving Day; a holiday
December	2	Thursday	State Day Convocation
December	15-18		Final examination period
December	16	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	18	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	22	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
December	30-31		Registration days for new students in all colleges

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, general information bulletin, page 50.

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 8:00 in the Medical School and 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.

CALENDAR

1927				
January	3	Monday	Christmas vacation ends, winter quarter classes begin, 8:30 ² a.m.	
January	29	Saturday	First semester extension classes close	
January	31	Monday	Second semester extension classes begin	
February	12	Saturday	Lincoln's Birthday; a holiday	
February	17	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.	
February	22	Tuesday	Washington's Birthday; a holiday	
March	16-19		Final examination period	
March	17	Thursday	Payment of fees closes for all students in residence winter quarter ¹	
March	19	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.	

Spring Quarter

March	21-23		Entrance examinations
March	25-26		Registration days for new students in all colleges
March	28	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ² a.m.
April	15	Friday	Good Friday; a holiday
May	12	Thursday	Cap and Gown Day Convocation
May	19	Thursday	Senate meeting, 4:30 p.m.
May	28	Saturday	Second semester extension classes close
May	30	Monday	Memorial Day; a holiday
June	8-11		Final examination period
June	11	Saturday	Spring quarter closes, 5:20 p.m.
June	12	Sunday	Baccalaureate service
June	13	Monday	Fifty-fifth annual commencement

Summer Session

June	17-18		Summer Session first term begins, registration and payment of fees
June	20	Monday	Classes begin, 8:00 a.m.
July	4	Monday	Independence Day; a holiday
July	30	Saturday	Registration and payment of fees for second term closes
August	1	Monday	Second term classes begin
September	3	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, page 50.

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 8:00 in the Medical School and at 8:15 at University Farm.

THE SCHOOL OF BUSINESS

THE COURSES OF STUDY

Students who have completed with a C average one of the two-year pre-business programs or its equivalent are eligible for admission to the junior class of the School of Business. 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.

In the School of Business 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.

The programs of study here given will therefore be varied as each particular case dictates, but no student will be recommended for a degree in any course who has not completed all of the pre-business requirements and Economics 51-52-53, 101-102, 141, 149, and 155. Courses 100 and 180-181-182 are strongly recommended.

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 (Economics 89)	3
Monetary and Banking Policy (Economics 141)	3
Report Writing (Economics 100)	1
Business Law (Economics 51-52-53)	9
Economics of Marketing (Economics 85)	3
Corporation Finance (Economics 155)	3
Electives (See list below)	20 to 29

SENIOR YEAR

	Credits
Cost Accounting (Economics 130)	3
Labor Problems (Economics 161)	3
Business Cycles (Economics 149)	3
Advanced General Economics (Economics 101-102).....	6
Economics of Transportation (Economics 172)	3
Personnel Administration (Economics 167)	3
Geography of Commercial Production (Geog. 61)	3
Finance Management (Economics 156)	3
Electives (See list below)	13 to 22

SCHOOL OF BUSINESS

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
Police Power	3
Foreign Exchange	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 (Economics 131-132-133)	9
Accounting Practice and Procedure (Economics 137-138)	6
Advanced General Accounting (Economics 139)	3
Business Law (Economics 51-52-53)	9
Monetary and Banking Policy (Economics 141)	3
Report Writing (Economics 100)	1
Corporation Finance (Economics 155)	3
Electives (See list below)	9 to 22

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102)	6
Business Cycles (Economics 149)	3
Income Tax Accounting (Economics 134)	3
Auditing (Economics 135-136)	6
Accounting Topics Course (Economics 180-181-182)	9
Electives (See list below)	15 to 24

COURSES OF STUDY

7

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
Economics of Marketing	3
Office Management	3
Investments	3
Property Insurance	3
Business Statistics	3
Advanced English Composition	9

III. 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 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 (Economics 100)	1

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102)	6
Economics of Transportation (Economics 172)	3
Railway Traffic and Rates (Economics 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

SCHOOL OF BUSINESS

RECOMMENDED ELECTIVES

	Hours
Market Prices	3
Economic History	3 to 6
Business Statistics	3
Theory of Statistics	3
Corporation Finance	3
Commercial Policies	6
Public Finance	6
Marketing Management	6
Farm Management Organization	3
Farm Management Operation	3

IV. BANKING

Adviser, Mr. Stehman

This program is designed for persons who expect to become connected with banks and bond houses.

JUNIOR YEAR

	Credits
Monetary and Banking Policy (Economics 141)	3
Report Writing (Economics 100)	1
Corporation Finance (Economics 155)	3
Business Law (Economics 51-52-53)	9
Electives (See list below)	22 to 31

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102)	6
Bank Administration (Economics 147)	3
Finance Management (Economics 156)	3
Investments (Economics 146)	3
The Securities Market (Economics 148)	3
Business Cycles (Economics 149)	3
Foreign Exchange (Economics 145)	3
Finance Topics Course (Economics 180-181-182)	9
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
Economics of Marketing	3
Geography	5-9
Land Economics	5
Agricultural Economics	3
Life Insurance	3
Business Statistics	3
The Trust Problem	3
Public Utilities	3

V. 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 (Economics 100)	1
Economics of Marketing (Economics 85)	3
Economics of Transportation (Economics 172)	3
Railway Traffic and Rates (Economics 73)	3
Psychology of Advertising (Psychology 56)	3
Foreign Exchange (Economics 145)	3
Advertising (Economics 88)	3
Transportation Problems (Economics 174)	3
Geography of Commercial Production (Geography 61)	5
Electives (See list below)	7 to 17

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102)	6
Business Law (Economics 51-52-53)	9
Commercial Policies (Economics 176)	3
International Law (Economics 121-122)	6
Foreign Trade (Economics 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

VI. PERSONNEL MANAGEMENT

Adviser, Mr. Paterson

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.

SCHOOL OF BUSINESS

JUNIOR YEAR

	Credits
Labor Problems and Trade Unionism (Economics 161)	3
Labor and Economic Reform Movements (Economics 162)	3
Economic Aspects of Population and Immigration (Economics 163)	3
Monetary and Banking Policy (Economics 141)	3
Report Writing (Economics 100)	1
Business Law (Economics 51-52-53)	9
Economics of Marketing (Economics 85)	3
Production Management (Economics 89)	3
Personnel Administration (Economics 167)	3
Advanced Personnel Administration (Economics 168)	3
Corporation Finance (Economics 155)	3
Electives (See list below)	3 to 9

SENIOR YEAR

	Credits
Business Statistics (Economics 112)	3
Social Insurance (Economics 62)	3
Business Cycles (Economics 149)	3
Advanced General Economics (Economics 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 (Economics 180-181)	4
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

VII. 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 (Economics 100)	1
Economics of Marketing (Economics 85)	3
Business Law (Economics 51-52-53)	9
Corporation Finance (Economics 155)	3
Advertising (Economics 88)	3
Psychology of Advertising (Psychology 56)	3
Marketing Organization: Agricultural Products (Economics 108)	3
Cost Accounting (Economics 130)	3
Electives (See list below)	7 to 16

COURSES OF STUDY

II

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102)	6
Economics of Transportation (Economics 172)	3
Railway Traffic and Rates (Economics 73)	3
Commercial Policies (Economics 176)	3
Business Cycles (Economics 149)	3
Marketing Topics Course (Economics 180-181-182)	9
Electives (See list below)	10 to 21

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 9
Labor Problems	3
Logic	5
Production Management	3
Foreign Trade	3
Personnel Administration	3
Geography of Commercial Production	5
Prices of Farm Products	3
Business Statistics	3
Public Utilities	3
Textiles	3
Market Prices	3
Theory of Statistics	3
Government and Business	3
Transportation Problems	3
Land Economics	3
Labor Problems	3
Psychology in Personnel Work	3
Psychology of Human Behavior	6
Property Insurance	3
Constitutional Law	6
Advanced English Composition	9

VIII. 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 (Economics 94-95-96)	15
Monetary and Banking Policy (Economics 141)	3
Report Writing (Economics 100)	1
Business Law (Economics 51-52-53)	9
Types of Writing (Rhetoric 18-19)	6
Corporation Finance (Economics 155)	3
Electives (See list below)	12 to 21

SCHOOL OF BUSINESS

SENIOR YEAR

	Credits
Advanced Shorthand and Typewriting (Economics 97-98-99)	15
Advanced General Economics (Economics 101-102)	6
Office Organization and Management (Economics 86)	3
Business Cycles (Economics 149)	3
Secretarial Topics Course (Economics 180-181)	6
Electives (See list below)	9 to 18

RECOMMENDED ELECTIVES

	Hours
Life Insurance	3
Social Insurance	3
Economics of Marketing	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

IX. 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
Economics of Marketing (Economics 85)	3
Business Law (Economics 51-52-53)	9
Mechanism of Exchange (Economics 3)	5
Railway Traffic and Rates (Economics 73)	3
Corporation Finance (Economics 155)	3
Business Cycles (Economics 149)	3
Elements of Statistics (Economics 14)	5
Production Management (Economics 89)	3
Electives (See list below)	9 to 19

COURSES OF STUDY

13

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102)	6
Cost Accounting (Economics 131-132-133)	9
Monetary and Banking Policy (Economics 141)	3
Report Writing (Economics 100)	1
Labor Problems (Economics 161)	3
Personnel Administration (Economics 167)	3
Advanced Personnel Administration (Economics 168)	3
Electives (See list below)	20 to 24

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

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

PROGRAM*

1926-27

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Introduction to Economics (10 cred.; pre-bus. fr.; no prereq.)				Mr. J. D. Black and others
	Lect.	III	Th	OLAud	
	Sec. 1	I	TThFS	104B	
	2	I	TThFS	109B	
	3	II	TThFS	209B	
	4	II	TThFS	204B	
	5	III	MWFS	109B	
	6	III	MWFS	104B	
	7	IV	MWFS	209B	
	8	IV	MWFS	109B	
	9	V	MTWF	6B	
	10	VI	MWThF	109B	
	11	VII	MWThF	109B	
	12	VIII	MWThF	6B	
1s-(2f)†	Introduction to Economics (10 cred.; pre-bus. fr.; no prereq.)				Mr. J. D. Black and others
	Lect.	III	Th	202B	
	Sec. 1	II	TThFS	204B	
	2	IV	MWFS	213B	
	3	VI	MWThF	109B	
3w	The Mechanism of Exchange (5 cred.; 3d qtr. fr., soph., jr., sr.; no prereq.)				Mr. Dowrie and others
	Lect.	III	TTh	202B	
	Sec. 1	II	MWF	109B	
	2	III	MWF	204B	
	3	VI	MWF	6B	
3s	The Mechanism of Exchange (5 cred.; 3d qtr. fr., soph., jr., sr.; prereq. none)				Mr. Dowrie and others
	Lect.	III	TS	OLAud	
	Sec. 1	I	TThS	6B	
	2	I	TThS	102B	
	3	II	TThS	102B	
	4	II	TThS	209B	
	5	III	MWF	213B	
	6	III	MWF	204B	
	7	IV	MWF	109B	
	8	IV	MWF	204B	
	9	V	MWF	202B	
	10	VI	MWF	202B	
	11	VII	MWF	209B	
	12	VIII	MWF	209B	

* 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 1926-27.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
4f‡	Principles of Economics—Pre-business .. (5 cred.; soph., pre-bus. only; prereq., 1-2)				Mr. Hansen and others
	Lect.	I	M	301B	
	Sec. 1	I	TThFS	213B	
	2	II	MWFS	202B	
	3	III	TThFS	204B	
	4	IV	MWFS	213B	
	5	V	MTWF	202B	
	6	VI	MWThF	6B	
4s*	Principles of Economics—Pre-business (See 4f)				Mr. Hansen and others
	Lect.	I	M	202B	
	Sec. 1	I	TThFS	109B	
	2	III	TThFS	6B	
	3	VI	MWThF	6B	
(6s)-7f	Principles of Economics—General Course	See Science, Literature, and the Arts bulletin			
6f-7w	Principles of Economics—General Course	See Science, Literature, and the Arts bulletin			
6w-7s	Principles of Economics—General Course	See Science, Literature, and the Arts bulletin			
6s-(7f)	Principles of Economics—General Course	See Science, Literature, and the Arts bulletin			
8f-9w-10s	General Economics	See College of Engineering bulletin			
14s	Elements of Statistics				
	(5 cred.; soph., jr., sr.; prereq., 4 or 6-7)				
	Sec. 1	I	MTWThF	301B	Mr. Mudgett and others
	2	II	MTWThF	301B	
	3	III	MTWThF	301B	
	4	IV	MTWFS	301B	
	5	V	MTWThF	301B	
	6	VI	MTWThF	301B	
	7	VII	MTWThF	301B	
	8	VIII	MTWThF	301B	

* Open to pre-business students only.

‡ Open to pre-business students only.

() Numbers in parentheses do not refer to the year 1926-27.

SCHOOL OF BUSINESS

No.	Title	Hour	Day	Bldg.	Instructor
25f-26w†	Principles of Accounting				Mr. Heilman and others
	(8 cred.; soph., jr., sr.; no prereq.)				
	Lect. Sec. 1	I	MWF	301B	
	2	I	TThS	301B(f only)	
	3	II	MWF	301B	
	4	II	TThS	301B	
	5	III	MWF	301B(f only)	
	6	III	TThS	301B	
	7	IV	MWF	301B(f) 213B(w)	
	8	V	MWF	301B(f only)	
	9	VI	MWF	301B	
	10	II	MWF	303B(f) 213B(w)	
	Laboratory sections to be arranged.				
25w-26s†	Principles of Accounting				Mr. Heilman and others
	Lect. Sec. 1	II	MWF	303B	
	2	I	TThS	301B	
	3	III	MWF	303B	
	4	IV	MWF	301B(w)302B(s)	
	5	VI	MWF	302B(w only)	
	Laboratory sections to be arranged.				
29f	Principles of Accounting	See	College of Engineering	bulletin	
51f-52w-53s†	Business Law	See	Political Science	51-52-53	
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)				
62s	Social Insurance	III	TThS	102B	Mr. Graves
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
73w	Railway Traffic and Rates	VII	MWF	202B	Mr. Cum- mings
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
80f-81w	Introduction to Economic History	See	History 80-81		
82f-83w-84s	Economic History of the United States	See	History 82-83-84		
85f	Economics of Marketing				
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
	Lect.	I	T	202B	Mr. Vaile
	Sec. 1	I	ThS	202B	
	2	I	WF	209B	
	3	III	ThS	213B	
85s	Economics of Marketing				
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
	Lect.	I	T	202B	Mr. Vaile
	Sec. 1	I	ThS	202B	
	2	I	WF	209B	
	3	III	ThS	213B	
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., 85, Psy. 156)				
89w	Production Management	I	TThS	6B	Mr. O'Hara
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
89s	Production Management	II	MWF	102B	Mr. O'Hara
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
90s	Economics of Consumption	See	Agricultural Economics	126	

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

PROGRAM

No.	Title	Hour	Day	Hldg.	Instructor
94f-95w-96s†	Secretarial Training (15 cred.; jr., sr.; prereq., 4 or 6-7)	VI-VII	MTWThF	1B	Miss Leonard, Mrs. Gray
97f-98w-99s†	Advanced Secretarial Training (15 cred.; sr.; prereq., 94-95-96)	VI-VII	MTWThF	213B	Miss Leonard
100f,w,s	Report Writing (1 cred.; jr., sr. To be taken in connection with Econ. 141)	Ar	Ar	Ar	Mr. Heilman and others
101f-102w†	Advanced General Economics (6 cred.; sr.; prereq., 4 or 6-7)				Mr. Garver
	Sec. 1	III	MWF	102B	
	2	IV	MWF	102B	
	3	I	TThS	209B	
	4	III	TThS	6B	
103f-104w†	Value and Distribution	See Science, Literature, and the Arts bulletin			
105s	History of Economic Ideas—The Classical Economists (3 cred.; jr., sr., grad.; prereq., 101-102 or 103-104)	VII	MWF	102B	Mr. Garver
106s	History of Economic Ideas—The Critics of the Classical Economists (3 cred.; jr., sr., grad.; prereq., 105 or permission of instructor)	(Not offered in 1926-27)			
108w*	Marketing Organization: Agricultural Products (3 cred.; jr., sr., grad.; prereq., 85; not open to agr. bus. students)	VIII	MWF	102B	Mr. Price
110f-111w	Economics of Agricultural Production ..	See Agricultural Economics 110-111			
112f	Business Statistics (3 cred.; jr., sr., grad.; prereq., 14)	I	MWF	6B	Mr. Mudgett
113w-114s	Theory of Statistics (6 cred.; jr., sr., grad.; prereq., 14)	I	MWF	6B	Mr. Mudgett
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			
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

* Section on main campus.

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

SCHOOL OF BUSINESS

No.	Title	Hour	Day	Bldg.	Instructor
139S	Advanced General Accounting	IV	MWF	303B	Mr. Heilman
	(3 cred.; jr., sr., grad.; prereq., 25-26)				
141f	Monetary and Banking Policy				Mr. Dowrie 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	102B	
	2	III	TThS	209B	
	3	IV	MWF	204B	
	4	VI	MWF	209B	
141W	Monetary and Banking Policy				Mr. Dowrie and others
	(3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)				
	Sec. 1	II	TThS	102B	
	2	IV	MWF	104B	
	3	VIII	MTW	209B	
141S	Monetary and Banking Policy				Mr. Dowrie and others
	(3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)				
	Sec. 1	II	MWF	209B	
	2	VII	MWF	109B	
	3	IV	MWF	204B	
145W	Foreign Exchange	IV	MWF	204B	Mr. Myers
	(3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)				
146f	Investments	IX	MTW	202B	Mr. Ebersole
	(3 cred.; jr., sr., grad.; prereq., 3, and 155)				
147S	Bank Administration	IX	MTW	202B	Mr. Ebersole
	(3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)				
148W	The Securities Market	IX	MTW	209B	Mr. Ebersole
	(3 cred.; sr., grad.; prereq., 146, 149)				
149f	Business Cycles	VIII	MTW	209B	Mr. Ebersole
	(3 cred.; sr., grad.; prereq., 3, and 4 or 6-7)				
149W	Business Cycles	III	MWF	6B	Mr. Myers
	(3 cred.; sr., grad.; prereq., 3, and 4 or 6-7)				
149S	Business Cycles				
	(3 cred.; sr., grad.; prereq., 3, and 4 or 6-7)				
	Sec. 1	VIII	MTW	202B	Mr. Ebersole
	2	III	MWF	102B	Mr. Myers
150S	Advanced Farm Finance	VI-VII	W	104B	Mr. Myers
	(3 cred.; sr., grad.; prereq., 3, and 4 or 6-7)				
151f	Prices of Farm Products	See Agricultural Economics		130	
153W	The Trust Problem	II	MWF	202B	Mr. Stehman
	(3 cred.; jr., sr., grad.; prereq., 155)				
154S	Public Utilities	(Not offered in 1927-27)			
	(3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 4 or 6-7)				

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
1558	Corporation Finance (3 cred.; jr., sr., grad.; prereq., 3, 4 or 6-7)				
	Lect.	III	Th	OLAud	Mr. Stehman and others
	Sec. 1	I	TTh	204B	
	2	III	MW	6B	
	3	III	MW	104B	
	4	IV	MW	209B	
	5	II	TTh	109B	
	6	VII	TTh	102B	
156f	Finance Management (3 cred.; jr., sr., grad.; prereq., 155)				
	Sec. 1	I	TThS	102B	Mr. Stehman
	2	II	TThS	102B	
157f	Police Power	See	Political Science	157	
158s	Government and Business	See	Political Science	158	
159w	The Law of Public Utilities	See	Political Science	159w	
161f	Labor Problems and Trade Unionism (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
	Lect.	IV	MW	202B	Mr. Hansen
	Sec. 1	III	F	213B	
	2	IV	F	202B	
161w	Labor Problems and Trade Unionism (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				Mr. Hansen
	Lect.	III	TTh	209B	
	Sec. 1	III	S	209B	
	2	IV	S	202B	
162w	Labor and Economic Reform Movements (3 cred.; jr., sr., grad.; prereq., 161)	IV	MWF	202B	Mr. Hansen
163s	Economic Aspects of Population and Immigration (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	IV	MWF	202B	Mr. Hansen
165s	Colonization	See	Political Science	103	
167w	Personnel Administration (3 cred.; jr., sr., grad.; prereq., 161)				
	Sec. 1	I	TThS	202B	Mr. Stead
	2	II	TThS	213B	
168s	Advanced Personnel Administration (3 cred.; jr., sr., grad.; prereq., 167)	I	TThS	209B	Mr. Stead
170s	Land Economics (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	VII-VIII	TTh	209B	Mr. Black
171s	Land Tenure	See	Agricultural Economics	171	
172f	Economics of Transportation (3 cred.; jr., sr.; prereq., 4 or 6-7)	VI	MWF	202B	Mr. Cummings
172w	Economics of Transportation (3 cred.; jr., sr.; prereq., 4 or 6-7)	VI	MWF	102B	Mr. Cummings
172s	Economics of Transportation (3 cred.; jr., sr.; prereq., 4 or 6-7)	VII	MWF	202B	Mr. Cummings
174s	Transportation Problems (3 cred.; jr., sr.; prereq., 172)	VI	MWF	102B	Mr. Cummings

SCHOOL OF BUSINESS

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	204B	Mr. Blakey
	(3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
177w	Foreign Trade	I	MWF	202B	Mr. Blakey
	(3 cred.; jr., sr., grad.; prereq., 176)				
180f-181w-182s†	The Senior Topics Courses				
	(School of Business seniors)				
	A. Accounting	II	TThS	213Bf	104Bw and s Mr. Reighard
	(9 cred.)				
	B. Business Finance	VII-VIII	T	213B	Mr. Dowrie and others
	(6 cred.)				
	C. Marketing	VI-VII½	TTh	104B	Mr. Vaile
	(9 cred.)				
	D. Personnel Management	Ar	Ar	Ar	Mr. Stead and others
	(4 cred.; fall and winter only)				
	E. Secretarial Practice	IV	MWF	1B	Miss Leonard
	(6 cred.; fall and winter only)				
187s	Market Prices	VIII-IX½	WF	104B	Mr. Vaile, Mr. Garver, Mr. Waite
	(3 cred.; grad. sr. by permission; prereq., 101-102 or 103-104)				
191f-192w†	Public Finance	II	MWF	102B	Mr. Blakey
	(6 cred.; jr., sr., grad.; prereq., 3, 4 or 6-7)				
193s	State and Local Taxation	II	MWF	109B	Mr. Blakey
	(3 cred.; jr., sr., grad.; prereq., 191-192)				

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

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

General Extension Division
Announcement of Extension Classes
1926-1927



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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.

1926			
September	20-25		Registration
September	27	Monday	First semester begins
November	25	Thursday	Thanksgiving Day; a holiday
December	23	Thursday	Christmas recess begins
1927			
January	3	Monday	Class work resumed
January	24-28		Examinations, first semester classes
January	31	Monday	Second semester begins
May	23-27		Examinations, second semester classes

Attention is called to the fact that the campus office of the General Extension Division has been removed from the Main Engineering Building to 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 grows 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 thorough 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, Brainerd, 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. In extension classes of this nature many persons are completing a considerable part of the work required for a degree in the colleges mentioned.

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
John E. Anderson, Ph.D., Professor, Director of the Institute of Child Welfare
Milton J. Anderson, B.S. in Arch., Instructor in Architecture, Duluth
Carlos Arjona, Ph.D., Assistant Professor of Romance Languages
Winfield W. Bardwell, LL.M. Judge of the Hennepin County District Court, Instructor in Business Law
Frederic H. Bass, B.S., Professor in Municipal and Sanitary Engineering
William O. Beal, M.A., M.S., Assistant Professor of Astronomy and Assistant Astronomer
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., Instructor in 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
J. William Buchta, M.A., Instructor in Physics
Samuel C. Burton, M.A., Assistant Professor of Architecture
Eula B. Butzerin, B.S., R.N., Instructor in Preventive Medicine and Public Health
Jessie F. Caplin, M.S., Instructor in Textiles
George G. Chapin, B.A., LL.B., Instructor in Business Law
Edward G. Cheyney, B.A., Professor of Forestry
Edwin L. Clarke, Ph.D., Assistant Professor of Sociology
Herbert E. Clefton, Ph.D., Assistant Professor of Romance Languages
William H. Crago, Instructor in Geology
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
Joseph E. Cummings, M.A., Assistant Professor of Economics
Alvin S. Cutler, C.E., Professor of Railway Engineering
James Davies, Ph.D., Assistant Professor of German
Darrell H. Davis, Ph.D., Associate Professor of Geology
Paul R. DeFreece, B.S. in C.E., Instructor in Mechanical Drawing
Harold S. Diehl, M.A., M.D., Associate Professor of Preventive Medicine and Public Health
Jay K. Ditchey, Ph.D., Assistant Professor of Romance Languages
Edith D. Dixon, B.S., Assistant Professor, Institute of Child Welfare
Homer H. Dubs, B.D., Ph.D., Instructor in Philosophy
J. Franklin Ebersole, M.A., Professorial Lecturer in Economics

- Oliver C. Edwards, B.S., M.E., Assistant Professor of Mechanical Engineering, General Extension Division
- Lu Lester Everly, M.A., Instructor in Geography
- Donald N. Ferguson, M.A., Associate Professor of Music
- William L. Fichter, Ph.D., Assistant Professor of Romance Languages
- Ross L. Finney, LL.B., Ph.D., Assistant Professor of Educational Sociology
- William K. Foster, LL.M., M.D., Assistant Professor of Physical Education 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
- George G. Glick, B.A., LL.B., Instructor in Business Law
- Richard A. Graves, M.A., Instructor in Economics
- J. Stanley Gray, M.A., Instructor in Public Speaking
- Harry S. Greiner, E.E., Instructor in Electric Vehicles
- Marguerite Guinotte, Brevet Supérieur, Certificat d'Aptitude Pédagogique, M.A., Instructor in Romance Languages
- Henry R. Halsey, B.S., Instructor in Investments
- Leah M. Hanley, B.S., Instructor in Art Education
- Oscar E. Harder, Ph.D., Professor of Metallography
- Samuel B. Harding, Ph.D., Professor of History
- Donald Harries, LL.B., Instructor in Business Law
- Landreth M. Harrison, M.A., Instructor in Political Science
- Edward W. Hawley, B.A., LL.M., Instructor in Parliamentary Law
- Ronald M. Hazen, B.S. (M.E.), Instructor in Mechanical Engineering
- Donald C. Heath, B.S. (Arch.), Instructor in Engineering and Architecture
- Ernest A. Heilman, Ph.D., Associate Professor of Accounting
- Louis B. Hessler, Ph.D., Assistant Professor of English
- Carl A. Herrick, M.E., Assistant Professor of Mathematics and Mechanics
- James T. Hillhouse, Ph.D., Assistant Professor of English
- William T. 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
- G. Sidney Houston, Jr., Instructor in Accounting
- Elmer Johnson, E.E., Assistant Professor in Electrical Engineering
- Irving W. Jones, Ph.B., Assistant Professor of Music
- Rex H. Kitts, B.A., LL.B., Instructor in Business Law
- Alfred E. Koenig, M.A., Dr. Theol., Special Lecturer in Americanization
- 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. Kuhlmann, B.A., E.E., Assistant Professor of Electrical Design
Maurice B. Lagaard, C.E., Assistant Professor of Structural Engineering
Fred C. Lang, C.E., Associate Professor of Highway Engineering
William LeBorions, Instructor in Accounting
George F. Lussy, Ph.D., Assistant Professor of German
Gustav A. Lundquist, M.A., Assistant Professor of Rural Sociology
Frederick M. Mann, M.S., C.E., Professor of Architecture
John J. Martenis, M.E., Associate Professor of Machine Design
William B. Millen, B.A., Instructor in Finance
Cecil A. Moore, Ph.D., Associate Professor of English
Amy P. Morse, B.A., Assistant Professor of Drawing and Design
Wayne L. Morse, M.A., Instructor in English
Jay A. Myers, M.D., Ph.D., Assistant Professor of Preventive Medicine
Walter R. Myers, Ph.D., Assistant Professor of Economics
Charles W. Nichols, Ph.D., Assistant Professor of English
William E. Niemackl, Instructor in Accounting
Elizabeth Nissen, M.A., Instructor in Romance Languages
Everett W. Olmsted, Ph.D., Litt.D., Professor of 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
Stanley H. Perry, B.A., Instructor in History, General Extension Division
Orrin W. Potter, E.M., Instructor in Drawing and Descriptive Geometry
Charles H. Preston, B.A., C.P.A., Lecturer in Accounting
George C. Priester, M.S., Assistant Professor of Mathematics and Mechanics
Thomas H. Quinn, Instructor in Business Law
Paul H. Rangere, Instructor in Advertising
Frank M. Rarig, M.A., Professor of Public Speaking
Samuel N. Reep, Ph.D., Instructor in Real Estate
M. Emma Roberts, Instructor in Art
Gertrude D. Ross, B.S., Instructor in Art Education
Clare L. Rotzel, B.C.S., C.P.A., Associate Professor of Accounting, General Extension Division (in charge of Business courses)
Frank B. Rowley, B.S., M.E., Professor of Mechanical Engineering
Wilford 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
A. J. B. Schmidt, B.S. in E., C.P.A., Instructor in Accounting
Max Scham, M.D., Assistant Professor of Pediatrics
S. Carl Shipley, B.S., M.E., Professor of Machine Construction and Superintendent of Shops
Lester B. Shippee, Ph.D., Professor of History
Charles F. Shoop, B.S., B.S. (M.E.), Professor of Steam Engineering
Arthur V. Smith, Instructor in Accounting
J. Warren Stehman, Ph.D., Associate Professor of Economics
George M. Stephenson, Ph.D., Assistant Professor of History
Thomas E. Steward, B.A., Assistant Professor of Journalism

- Hazel B. Stevens, M.S., Instructor of English, General Extension Division
Andrew A. Stomberg, M.S., Professor of Scandinavian Languages and Literatures
Nettie Strate, Instructor in Educational Hygiene
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)
Milo E. Todd, B.A., E.E., Associate Professor of Radio and Electric Power Engineering
Robert H. Tuttle, Instructor in Accounting
Roland S. Vaile, M.A., Associate Professor of Economics
Fred K. von Borgersrode, B.S., Assistant Director of Bureau of Educational Research
Archie F. Wagner, B.A., C.P.A., Instructor in Accounting
Warren C. Waite, Ph.D., Assistant Professor of Economics
Lehman Wendell, B.S., D.D.S., Instructor in Esperanto
Wendell White, Ph.D., Instructor in Psychology, General Extension Division
Hugh B. Wilcox, M.S., Assistant Professor of Mathematics and Mechanics
Norman Wilde, Ph.D., Professor of Philosophy
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 or 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 15 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 registration, 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 38 and 48) 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 credit shall be given only to those extension courses which are conducted in essentially the same manner as the corresponding courses in the University, and which are carried on under similar conditions as to attendance, term's work, quizzes, and examinations.

2. Each credit course shall be directly in charge of a member of the faculty.

3. Any regularly enrolled University student successfully completing an approved course shall receive the appropriate credit.

4. Any person 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 ten per cent is made in the total fee of \$30 or more.

The fee does not include the cost of texts 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 will be 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 towards 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.

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 here offered are selected in the main from the College of Science, Literature, and the Arts, with two purposes in view. First, they are designed to afford an opportunity to persons who are candidates for degrees but who are unable to pursue their entire college course in residence, to complete a part of their work while otherwise engaged. Second, the advantage of university training in cultural subjects is offered those who can devote one or more evenings a week to such work, regardless of any desire for university credit.

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.

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.

ANTHROPOLOGY

114. Newer Immigrants. Characteristics, contributions, and distribution of the newer immigrant peoples in America; their modification and importance to us. Three credits; one meeting a week, second semester. Mr. Koenig.

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 natural 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 house; a study of period furniture with trips to the Art Institute; 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, first and second semesters. Class limited to twenty-five. 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. Prerequisite: 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; one meeting a week, second semester. Miss Ross.

*1ex. Camp Craft Course. An elementary course in the theory and practice of crafts needed in camps, such as pottery, bookbinding, wood blocking, stenciling, tie dyeing, batik, reed, basketry, pine needle basketry, geso and clay substitutes. (Not offered in 1926-27.)

*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; one meeting a week, first and second semesters. (Not offered in 1926-27.) Miss Roberts.

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, first semester. Mr. Beal.

CHEMISTRY

INORGANIC CHEMISTRY

- *14ex. 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.
- *16ex. 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 14 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. Mr. Anderson, Miss Dixon.
- 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. Mr. Anderson, Miss Dixon.

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 process, wastes of competition, etc.
- *101. Advanced General Economics.
- *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.
- *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, both semesters. Mr. White.

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. Mr. von Borgersrode.

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.
8. Shakespeare. Shakespeare's development as a dramatist up to King Lear, with some attention to the general history of English drama from 1580 to 1603. The course will include the reading of all Shakespeare's earlier plays and the masterpieces of his chief contemporaries, as well as studies in the technique of Elizabethan play writing and producing. Three credits; one meeting a week, first semester.
- *44-45. American Literature. 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.
- *66. 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.
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; one meeting a week, second semester. 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, first semester; repeated in second semester. Miss Stevens.
- *5. Composition V. A continuation of the preceding course. Three credits; one meeting a week, second semester. Miss Stevens.
- *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, first semester. Miss Stevens.

(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.
- *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.
- 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.

EXTENSION CLASSES

COURSES IN PUBLIC SPEAKING

Students in public speaking will be interested in the course in parliamentary law described on page 29.

- *41-42. General Course in Public Speaking. 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. Garns, Mr. Morse, Mr. Gray.
- *81-82-83. Interpretative Reading. Interpretation and oral expression of the various forms of literature—the essay, the short story, lyric and narrative poetry, and the drama. Open to those who have credit for Courses 1-2, College Composition and Rhetoric, and Public Speaking 41-42. Six credits; one meeting a week, first and second semesters. Mr. Rarig, Mr. Garns.
- *85-86. Advanced Public Speaking. 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 1926-27.) Mr. Garns.
- *9I. Play Production. A teacher's course in classroom dramatic interpretation. (Not offered in 1926-27.)

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

- I. 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

51. Human Geography. A study of space relations, climatic types, land forms and soils, drainage conditions, mineral resources, and contact with the sea as they affect economic activities and the distribution of population. Type illustrations are selected from many regions. Three credits; one meeting a week, first semester. Mr. Davis.
- *61. Geography of Commercial Production. A study of the geographic basis for the production of the principal commodities which enter into world trade, together with a consideration of the areas of consumption. Special attention is given to the factors localizing great manufacturing districts. Three credits; one meeting a week, second semester. Mr. Davis.
71. Geography of North America. (1) Continental study; physiographic development, climatic conditions, vegetation and natural regions. (2) An intensive study of each region, its resources, transportation routes, and part in our foreign commerce. Text, lectures, and reports. Three credits; one meeting a week, second semester. Mr. Everly.
- 118ex. Geography of Europe. Includes (1) Europe as a whole, its main physical features, climate, soils, vegetation, natural divisions, and peoples; and (2) a separate consideration of each of the present day countries from the standpoint of natural features, resources, industries, resulting centers of population, government, etc. Lectures, readings, and the preparation of charts. Three credits; one meeting a week, first semester. Mr. Everly.
- *119ex. Geography of South America. (1) The continental factors: physiography, climate, vegetation, and peoples. (2) An intensive study of each country, including physical features, mineral resources, agriculture and stock raising, transportation, centers of population, and world's commerce. Lectures, reading, and the preparation of charts. Three credits; one meeting a week, first semester. Mr. Everly.
- *120ex. Geography of Asia. Includes (1) a study of the continent as a whole, its physiographic features, climate, and distribution of vegetation; (2) a detailed study of each country, agricultural and mineral resources, transportation routes, and the response of the people to their geographic environment. Text, lectures, and reports. Three credits; one meeting a week, second semester. Mr. Everly.

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. Mr. Kroesch.

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, first 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.
- *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. Shippee.
- 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; one meeting a week, first semester. 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; one meeting a week, second semester. Mr. Krey.

SENIOR COLLEGE COURSES

- 101-102. French Revolution and Napoleonic Era. Lectures and assigned readings. Six credits; one meeting a week for two semesters. Mr. Harding and assistant.
- 112. History of American Immigration. Settlement and development of typical racial stocks in America. Text, lectures and assigned readings. Three credits; one meeting a week for one semester. Mr. Stephenson.
- 122ex. Early Political Leaders of the United States. Outstanding men considered in connection with the political movements 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 presi-

dential campaigns. Lectures, assigned readings. Three credits; one meeting a week for one semester. Mr. Stephenson.

For additional courses see schedule of classes issued before the opening of each semester.

HOME ECONOMICS

- *3. Textiles. Includes a discussion of those points in fabric study that are of value to both the purchaser and seller of fabrics—fabric structure, fibers employed in their manufacture, methods of substitution and adulteration, tests for quality, art and economic considerations in their purchase for clothing and household purposes. Three credits; one meeting a week, first semester. Miss Caplin.
- 13. Dressmaking. 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. Problems: preparation of a dress form, and the making of a wool dress and tailored silk waist. Three credits; one meeting a week, first semester. (Not offered in 1926-27.)
- 17. Advanced Clothing Construction. A laboratory course involving an application of the principles of costume modeling in the construction of one high grade garment, suit, coat, or dress. Three credits; one meeting a week, second semester. (Not offered in 1926-27.)
- 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 dependent upon dietetic treatment. Three credits; one meeting a week, first semester.
- *131ex. Interior Decoration I. The course will be prefaced by such a discussion of house plans as will give a proper and necessary background for the major part of the work. The principles involved in house furnishing will then 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, second semester. (Not offered in 1926-27.) Miss Morse.
- 54ex. Interior Decoration II. A continuation of extension course 131ex, upon which new courses will definitely be based. Problems will be worked on and accessories studied. 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.

- *2. News Writing II. A continuation of the above, with study of feature stories. Three credits; one meeting a week, second semester. Mr. Steward.

MATHEMATICS

One class in higher algebra (Course 1) 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. 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-half 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, first and second semesters. Mr. Edwards.
- *5. Higher Algebra. A review and a collegiate treatment of the topic for those who have had one year of elementary algebra. The course includes linear equations in one, two, and three unknowns, with solution by determinants; ratio and proportion, variation, quadratic equations in one and two unknowns, graphs, progressions, binomial theorem. Prerequisites: Courses A and B, or equivalent. Not open for credit to those who present higher algebra for entrance to college. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
- *6. Trigonometry. A course in plane and spherical trigonometry, designed to meet the needs of beginners and to include the subjects usually considered in the ordinary college course. The solution of triangles is treated quite fully, but not to the exclusion of analytical trigonometry. Prerequisites: Course 1 and logarithms. (Students who have not had logarithms in algebra may secure special mimeographed lessons on this subject.) Six credits; one meeting a week, first and second semesters. Mr. Teeter.
- *7. College Algebra. The study of variation, 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, partial fractions, series of complex num-

- bers, and mathematical induction. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
- *30. Plane and Solid Analytic Geometry. Includes 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. The fundamental problem of the equation and its locus forms the basis of the course. Prerequisite: Courses 6 and 7. Six credits; one meeting a week, first and second semesters. Mr. Teeter.
- *50. Differential Calculus. A first course in differential calculus, including 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. Textbook with supplementary written lectures and exercises. Prerequisites: Courses 6, 7, and 30. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
- *51. Integral Calculus. First course in integral calculus. The integration of various types of functions, the definite integral with application to areas, surfaces, and volumes of geometric figures, rectification of curves and simple problems of mechanics; practice in the technique of integration and the use of tables of integrals; evaluation of simple, double, and triple integrals. Prerequisite: Course 50. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
- *106. Differential Equations. Intended for students who expect to continue the study of engineering, the physical sciences, or pure mathematics. The primary object of the course is to familiarize the student with advanced differential and integral calculus and the application of common types of differential equations to geometry, electricity, mechanics, and physics. Prerequisite: Course 51. Six credits; one meeting a week, first and second semesters. Mr. Teeter, Mr. Edwards.

MUSIC

105. 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 expression, 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.

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, first and second semesters. Mr. Hawley.

PHILOSOPHY

- *I. Introduction to Philosophy. An introduction to the problems of philosophy through a reading of some of the more popular philosophic classics. Three credits; one meeting a week, first semester. Mr. Dubs.
- *10. Science and Religion. A popular discussion of religious problems as affected by contemporary science. Three credits; one meeting a week, second semester. Mr. Dubs.
- *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, first semester. Mr. Wilde.
- *129. Modern Political Thought. A study of the development of modern theories of the nature, basis, and authority of the state. Beginning with a preliminary sketch of the ideas of Plato and Aristotle, the course will include the most important political theories from the Renaissance to the present. Three credits; one meeting a week, first semester.

POLITICAL SCIENCE

The attention of students is called also to the course on Modern Political Thought listed under the heading Philosophy.

- I. 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. Mr. Harrison.
7. State Government. Complementary to Course I above. (Not offered in 1926-27.)
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 study of the foreign policies and international relations of the leading European powers today. Three credits; one meeting a week, second semester. Mr. Harrison.
- *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 power; 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 1926-27.) 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; one meeting a week, first semester. 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. (Not offered in 1926-27.) 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; one meeting a week, first semester. Mr. Young.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

50. Personal and Public 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. Three credits; one meeting a week, first semester.
- *53. Elements of Preventive Medicine. Susceptibility, resistance, and immunity to disease; methods of spread and the prevention of communicable and degenerative diseases; protection of food, water, and milk; school health work; vital statistics. 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. Prerequisites: Psychology 1-2 and Bacteriology 1 (or equivalent). Three credits; one meeting a week, first semester. Dr. Diehl.
- *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.
- *80. 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. The course deals with the practical problems of school health supervision and health education. It is intended primarily for teachers, directors of physical education, school nurses and administrators. Prerequisites: Biology 1-2 and Psychology 1-2. Three credits; one meeting a week, first and second semesters. Dr. Diehl, Dr. Myers, Dr. Seham, and Miss Strate.

PSYCHOLOGY

- *1. General Psychology I: Beginners' Course. Description and illustration of general aims and methods of psychology, introduction to analytic study of human conduct, with emphasis upon the native equipment of man. Special topics: reflex and instinctive adjustment to life; the rôle of the nervous system in conduct; emotion and feeling; sense-organ equipment; characteristics and conditions of attention; heredity and intelligence. Three credits; one meeting a week, first semester. Mr. White.

- *2. General Psychology II. A survey of important factors in mental development; study of habit formation and principles of economy in learning. Special topics; perception; memory and its improvement; imagination; problems of social adaptation, such as insanity, the delinquent, the criminal; factors in personality; mental hygiene. Prerequisite: Psychology I. Three credits; one meeting a week, second semester. -Mr. White.
- *3. Psychology Applied to Daily Life. Measurement of mental traits, development of intelligence, organization of personality, with applications to selected problems in medicine, law, education, sociology, and daily life. Open to all applicants. Prerequisite for college credit: Psychology I. Three credits; one meeting a week, both semesters. Mr. White.
- *Ed. 55. Elementary Educational Psychology. A survey of fundamental facts of human behavior involved in educational 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, both semesters. Mr. White.

PUBLIC SPEAKING AND RHETORIC

See English on page 20 of this bulletin.

ROMANCE LANGUAGES

FRENCH

- *1-2. Beginning French. 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.
- *3. Intermediate French. 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. Miss Guinotte, Mr. Ditchy.
- *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, first and second semesters. Mr. Frelin.
- *20. Elementary French Conversation and Composition. 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. 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.
- *3. Intermediate Spanish. 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 large 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. Elementary Spanish Conversation and Composition. The course will include a careful drill in pronunciation and practical phonetics. 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; one meeting a week, first and second semesters. Mr. Fichter.

SCANDINAVIAN

- *5. Norwegian Survey. Prose and Poetry. Six credits; one meeting a week, first and second semesters. (Not offered in 1926-27.) Mr. Bothne.
7. Beginning Swedish. Grammar, composition, conversation, reading of selected texts. Three credits; one meeting a week, first semester. Mr. Stomberg.
45. Scandinavian Mythology. Lectures, textbook, and collateral reading. Knowledge of the Scandinavian languages not required. Three credits; one meeting a week, first semester. Mr. Stomberg.
110. Ibsen. Lectures, reading, interpretation. Three credits; one meeting a week, first semester. (Not offered in 1926-27.) 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, first semester; repeated in second semester. Mr. Clarke.
- 2ex. Leadership. A course for the study of the psychology of leadership, and the means for discovering and developing leaders. No credit; one meeting a week. 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. Clarke.
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.
- *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 1926-27 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 1 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.
114. Rural Social Institutions. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. Lectures, discussions, and reports. Three credits; one meeting a week, second semester. Mr. Lundquist.
119. The Family. Economic and social problems of the normal family; contemporary problems of family instability. Three credits; one meeting a week, second semester. Mr. Clarke.
120. Social Progress. (Not offered in 1926-27 unless requested.)
140. History of Social Thought. (Not offered in 1926-27 unless requested.)
141. Contemporary Social Thought. (Not offered in 1926-27 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.

- *1. Swimming. Beginners—women only. One meeting a week; first and second semesters. Mr. Foster.
- *2. Swimming. Advanced—women only. One meeting a week; first and second semesters. Mr. Foster.

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 of the University.

Instruction.—The subjects of instruction are divided into three groups of courses of study; namely, those aiding in a preparation for accountancy, those aiding in preparation for banking, and those having for their object a general business training. In each of these courses certain fundamental subjects such as business law, economics, and business English are required.

Upon the completion of one of these courses, a University certificate in accountancy, banking, or general business, as the case may be, will be granted.

Admission to courses.—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 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.—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 of the University of Minnesota may obtain the degree of bachelor of science in business by registering in the School of Business 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 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 in accounting, finance, and general business.—Credits earned in this department can be applied towards a University certificate in accountancy, finance, or general business, as the case may be, and in addition, where the student has satisfied the University entrance requirements, may be applied towards a degree from the School of Business under certain restrictions. (For further information on this subject see the bulletin of the School of Business.)

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 (1½), Accounting Laboratory B (1½), 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).

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, proforma 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 Boriou, 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.
- *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.
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 will be 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—Financing a Business. 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.
- *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 1926-27 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. Mr. Ebersole.
- *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 1926-27 this course may be taken at the same time that the student is taking Finance B. Three credits; one meeting a week, second semester. Mr. Ebersole.
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 depart-

ment; 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 1926-27 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 1926-27.) Mr. Ebersole.
191. Finance H—Public Finance. Prerequisites: Finance A and elementary economics; second semester. (Not offered in 1926-27.)

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. 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. 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, Insurance, Insolvency, and Bankruptcy. (1) The organization, management, and responsibility of associations, partnerships, corporations, and business trusts. (2) Elements of the law of insurance. (3) 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 COMMERCE

- *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. Cummings, 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. Cummings, 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 costs 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.

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.
59. Insurance. A study of insurance fundamentals; American Mortality Tables in the case of life insurance, reserves, single premiums, periodical premiums, dividends, loading, annuities, mutual companies and stock companies, hazards and rate making, state supervision and laws. 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.
- *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 a degree, three credits for a certificate in business; one meeting a week, second semester.
- *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 all art instruction necessary. No credit for degree. Three credits for a certificate in business; one meeting a week, second 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.

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, but 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.

Preliminary course.—The following preliminary course is recommended and usually taken by those who have not had a thoro training in higher algebra and physics before entering our regular course of study in engineering.

FIRST YEAR

First Semester
Shop Mathematics I
Mechanical Drawing I
English for Engineers

Second Semester
Shop Mathematics II
Mechanical Drawing II
English for Engineers

SECOND YEAR

First Semester
Shop Mathematics III
Physics I

Second Semester
Physics II
Physics Laboratory

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 a 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 for 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 YEAR

First semester.—Elements of Architecture I (3 credits); Freehand Drawing I (1½); Trigonometry I (3).

Second semester.—Elements of Architecture II (3); Freehand Drawing II (1½); Trigonometry II (3).

SECOND YEAR

First semester.—Architectural Design I (3); Freehand Drawing III (1½); Analytic Geometry I (3).

Second semester.—Architectural Design II (3); Freehand Drawing IV (1½); Analytic Geometry II (3).

THIRD YEAR

First semester.—Architectural Design III (3); History of Architecture I (3); Applied Mechanics (3) or Strength of Materials (3).

Second semester.—Architectural Design IV (3); History of Architecture II (3); Structural Design (3) or Reinforced Concrete (3).

FOURTH YEAR

First semester.—Architectural Design V (3); Introduction to the Theory of Engineering (3); Architectural Construction I (3).

Second semester.—Architectural Design VI (3); Heating and Ventilating (3); Architectural Construction II (3).

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.

FIRST YEAR

First semester.—Trigonometry I (3); Mechanical Drawing (3); Highways and Pavements I (3).

Second semester.—Trigonometry II (3); Structural Drafting (3); Highways and Pavements II (3).

SECOND YEAR

First semester.—College Algebra I (3); Applied Mechanics (3); Plane Surveying (3) or Map Drawing (3).

Second semester.—College Algebra II (3); Strength of Materials (3); Curves and Earthwork (3).

THIRD YEAR

First semester.—Analytic Geometry I (3); Reinforced Concrete (3) Introduction to the Theory of Engineering (3) or Hydraulics (3).

Second semester.—Analytic Geometry II (3); Reinforced Concrete Design (3) Introduction to the Theory of Engineering (3) or Structural Design I (3).

FOURTH YEAR

First semester.—Differential Calculus I (3) or Railway Engineering I (3) or Cost Estimating (3); Advanced Structural Design (3).

Second semester.—Differential Calculus II (3) or Railway Engineering II (3) or Municipal Engineering (3); Economics of Engineering Costs (3).

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 YEAR

First semester.—Trigonometry I (3); Mechanical Drawing (3); Boiler Room Practice (3).

Second semester.—Trigonometry II (3); Mechanical Drawing (3).

SECOND YEAR

First semester.—College Algebra I (3); Direct Current Machinery I (3); Direct Current Laboratory I (3).

Second semester.—College Algebra II (3); Direct Current Machinery II (3); Direct Current Laboratory II (3).

THIRD YEAR

First semester.—Alternating Currents I (3); Analytic Geometry I (3); Alternating Current Laboratory I (3).

Second semester.—Alternating Currents II (3); Analytic Geometry II (3); Alternating Current Laboratory II (3).

FOURTH YEAR

First semester.—Differential Calculus I (3); Applied Mechanics (3); Central Stations (3); Telephony (3) or Radio I (3); Electrical Machine Design I (3).

Second semester.—Differential Calculus II (3); Strength of Materials (3); Electrical Power Transmission (3); Telephony (3) or Radio II (3); Electrical Machine Design II (3).

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 have 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 YEAR

First semester.—Trigonometry I (3); Mechanical Drawing (3); Boiler Room Practice (3); English I (3).

Second semester.—Trigonometry II (3); Mechanical Drawing (3); Engine Room Practice (3) or English II (3).

SECOND YEAR

First semester.—College Algebra I (3); Advanced Mechanical Drawing I (3); Applied Mechanics (3).

Second semester.—College Algebra II (3); Advanced Mechanical Drawing II (3); Strength of Materials (3).

THIRD YEAR

First semester.—Analytic Geometry I (3); Machine Design I (3) or Direct Current Machinery (3); Steam Engines and Boilers (3) or Automotives (3) or Shop Methods (3).

Second semester.—Analytic Geometry II (3); Machine Design II (3) or Direct Current Machinery (3); Heat Engines (3) or Advanced Automotives (3) or Foundry Practice (3).

FOURTH YEAR

First semester.—Differential Calculus I (3); Advanced Mechanics (3); Heating and Ventilating (3) or Gas Engines and Producers (3) or Shop Management Problems (3).

Second semester.—Differential Calculus II (3); Advanced Mechanics (3) or Steam Fitting (3) or Gas Engine Testing (3).

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. Mr. Mann.
- ‡131-132-133. Architectural Design V-VI. Long, short, and sketch problems done under individual criticism dealing in general and more 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. 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.
12. Map Drawing. Farm and city plats; real estate display maps; landscape architect's maps; topographic and hydrographic symbols. Prerequisite: Trigonometry and Plane Surveying. Three credits; one meeting a week, second semester. Mr. Zelter.

‡ 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.

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.
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.
- *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.
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.
- *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.
- *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. Lagaard.
- *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. Lagaard.
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.
53. Municipal Engineering I-II. Development of municipal public works. City planning, transportation, and housing. The principles of public health and sanitation. Public water supplies, sewerage and sewage disposal, refuse collection and disposal, and the sanitation of buildings. Prerequisite: Hydraulics 129. Six credits; one meeting a week, first and second semesters. Mr. Bass.
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.
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 semester. Mr. Teeter.

ELECTRICAL ENGINEERING

- *111-113. 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.
- *112-114. 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.
- *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. Kuhlmann.
- 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. Kuhlmann.
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. 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.
63. Telephone Apparatus. Nature of voice sounds, frequency, and wave length. Construction and operation of receivers, transmitters, inductance and repeating coils, and the electromagnet as used in telephony. Primary and storage batteries ringing machines, and pole changers. Signaling equipment, including magnetos, ringers, and central energy lamp or visual signals. The treatment will be elementary, using only simple mathematics. Prerequisites: Direct Currents 111-113, Alternating Currents 121-123, Trigonometry, and Mechanical Drawing II. Three credits; one meeting a week, first semester. Mr. Swenson.
65. Telephone Circuits. Subscribers' sets for magneto and common battery exchanges; magneto and common battery circuits; circuit and blue print reading; cable codes, cable and line testing; inductance and capacity of lines, aerial and cable construction; traffic studies, and multiple switchboard arrangements. Prerequisite: Course 63, or its equivalent, Mechanical Drawing II. Three credits; one meeting a week, second semester. Mr. Swenson.

- *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. Swenson.
- *67. Radio Communication II. Continuation of prerequisite Course 66 or equivalent. Three credits; one meeting a week, second semester. Mr. Todd.

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 semester. Mr. French.
- *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.
- *47ex. Construction Cost Estimating I-II. Plan reading and cost estimating of buildings, bridges, culverts, roads, pavements, etc.; analysis of the cost of concrete, steel, timber, and brick construction, piling, transportation, equipment rental, overhead and general costs; cost estimates of buildings, bridges, culverts, etc. Lectures, classroom problems, and discussions. A drawing outfit is not needed, but working knowledge of blue print reading is desirable. Six credits; one meeting a week, first and second semesters. Mr. French.
- *48ex. Plan Reading and Shop Sketching. An elementary course of lectures and plan reading exercises for those who wish to obtain a knowledge of plan reading without a regular course in mechanical drawing. No drawing outfit is required. Interpretation of drawings of castings and machine parts, structural steel and concrete building, bridge plans, maps and topographical drawings, architectural plans of houses and larger buildings. No credit; one meeting a week, both 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, first semester; repeated in the second semester. Mr. Herrick.

- *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; spur gears, bevel gears, and spiral gears; cams, link motions, etc.; the application of empirical design and the principles of mechanics; assembly, diagrammatic and layout drawings. It is assumed that the student has a previous knowledge of drawing equivalent to Course 1-2. Six credits; one meeting a week, first and second semesters. Mr. Herrick.
- 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.
- *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.

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. Edwards, Mr. Boehnlein.

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. Edwards, Mr. Boehnlein.
- *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 triangles, 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. Edwards, Mr. Priestler.
- *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. 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.
- *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 radioactivity, X-rays, and vacuum tubes will also be taken up. This course should be taken in conjunction with Course 51ex. Two meetings a week, each semester. 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. One meeting a week, second semester. Mr. Buchta, Mr. Fukishima.
- *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. Teeter, Mr. Brooke.
- *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.
- *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 1926-27.)

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 and steel. 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. Marten's.

- *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. Gas Engines. A practical course in the theory of construction and operation of the gas engine. It includes various types of engines, cycles, ignition, carburetion, cooling, oiling, methods of determining horse power, etc. Three credits; one meeting a week, first semester. Mr. Rowley.
183. Gas Engine Testing. A practical laboratory course in gas engine testing in which the student performs tests on the various types of gas engines such as stationary oil and kerosene-burning engines, and automobile, airplane, and tractor motors. Students will keep records of the various tests in their notebooks. Prerequisite: Gas Engines, Course 150. Three credits; one meeting a week, second semester. Mr. Rowley.
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 I-II. A semi-technical course dealing with everyday foundry problems from a technical standpoint; designed to link up the practical with the technical in the simplest manner possible. It will appeal especially to foremen, clerks, mechanics, and other persons interested in foundry practice who have had the equivalent of a common grade school education. The course covers drawing, materials, metallurgy, sands, refractories, fluxes, foundry economics, foundry machinery, and office practice. Six credits; one meeting a week, first and second semesters. Mr. Potter.
- 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.

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.
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.
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.

Extension Certificates Granted, 1925-26

CERTIFICATE IN ACCOUNTING

John B. Andren	James E. Knight
William M. Babb	Alexander D. MacPhail
Hazen Carleton	Alexander D. McRae
Pearl M. Clinton	Jafet Marjama
Abraham J. Geller	Samuel A. Moy
George W. Heiges	Harry S. Rask
	Albert G. Sandberg

CERTIFICATE IN GENERAL BUSINESS

Martin Decker	George F. Julicher
Paul J. Huber	James E. Knight
	George G. Pierce

CERTIFICATE IN FINANCE

Leon R. Peel

CERTIFICATE IN ELECTRICAL ENGINEERING

Francis T. Pogle	Harry William Smith
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CERTIFICATE IN BUSINESS

Granted in June, 1925
Helmer Olaf Lindroth

Summary of Student Semester Registrations, 1925-26

Minneapolis collegiate	2,988	
Minneapolis business	1,637	
Minneapolis engineering	919	
St. Paul collegiate	988	
St. Paul business	711	
St. Paul engineering	141	
Duluth collegiate	745	
Duluth business	259	
Duluth engineering	281	
Hibbing collegiate	107	
Eveleth collegiate	11	
Faribault collegiate	27	
Faribault business	44	
Virginia collegiate	139	
Virginia business	34	
Two Harbors collegiate	21	
Two Harbors business	36	
Chisholm collegiate	28	
South St. Paul collegiate	20	
Rochester collegiate	33	
St. Cloud collegiate	25	
Red Wing business	28	
Total number of student semester registrations		9,222
Total number of individuals taking work 1925-26		5,318
Total collegiate registrations	5,132	
Total business registrations	2,749	
Total engineering registrations	1,341	

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.
 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, 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
1926-1927



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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, M.A., Assistant Professor of Romance Languages
William O. Beal, M.S., 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., Director, Division of Child Hygiene, State Board of Health
Oscar C. Burkhard, Ph.D., Associate Professor of German
Edward G. Cheyney, B.A., Professor of Forestry
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
John M. Gaus, Ph.D., Professor of Political Science
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
Gustav A. Lundquist, Ph.D., Assistant Professor of Rural Sociology
George F. Lussky, 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
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
Edward H. Sirich, Ph.D., Associate Professor of Romance Languages
Homer J. Smith, Ph.D., Associate Professor of Trade and Industrial Education

- 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. Teeter, 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
J. Franklin Ebersole, M.A., Ph.B., Professorial Lecturer in Economics
Jean H. Alexander, M.A., Instructor in History and Philosophy of Education
Reuel R. Barlow, B.A., Instructor in Journalism
C. Ralph Bennett, B.A., Instructor in English
Jessie Caplin, M.S., Instructor in Textiles
Monica Keating Doyle, B.A., Lecturer in Sociology
Ralph H. Farmer, B.A., Instructor in Economics
Adah G. Grandy, B.L., Instructor in English
Leah Miller Hanley, B.S. Instructor in Art, General Extension Division
Landreth M. Harrison, M.A., Instructor in Political Science
Jerome Jackman, B.A., Instructor in Business Law, General Extension Division
Frances R. Kelley, M.A., Instructor in Home Management
Otto F. Kuhlman, M.A., Instructor in Economics
Mary Malcolm, B.S., Assistant in Music
Helen P. Mudgett, M.A., Assistant in History
Sophia H. Patterson, M.A., Instructor, University High School
Stanley H. Perry, B.A., Instructor in History, General Extension Division
Hazel B. Stevens, M.S., Instructor in English, General Extension Division
Louis A. Tohill, M.A., Instructor in History, University High School
Harvey Walker, B.A., Assistant in Political Science
Nina L. Youngs, B.A., Instructor in Business

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.

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 entrance requirement (details of which may be found in the general information bulletin, to be had from the registrar of the University) is fifteen preparatory units, selected from five specific groups of subjects. The particular requirements in the several colleges vary, but all include four units of English, and two or more of mathematics. Practically all the required subjects may be taken by correspondence.

A preparatory unit means the equivalent of one year's work in a subject, five classroom periods each week. A student who pursues four courses each year for four years will have 16 preparatory units at graduation. In some schools a unit is divided into two credits, each credit meaning a half year's work. In other schools the words unit and credit are used interchangeably. The Correspondence Study Department follows the former plan; each of its preparatory courses 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.

CORRESPONDENCE COURSES

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

See courses marked with an asterisk under German, Greek, Latin, Romance Languages (French and Spanish) and Scandinavian (Norwegian and Swedish).

Group C: History and Social Science

American History A and B

Social Science A

Group D: Mathematics

Algebra A and B

Plane Geometry A and B

Solid Geometry

Higher Algebra I and II

Trigonometry

Group E: Natural Science

Elementary Physics A and B

(No credit; see note on page 38.)

Group F:

Mechanical Drawing I and II

(See Engineering, Courses 3 and 4, page 22.)

Elementary Bookkeeping

(See Business, Course 7, page 17.)

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.

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.

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.

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, but no reinstatements will be granted after a lapse of three years.

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.

FEES

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.

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 corre-

spondence 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 8.

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 of the foregoing methods, but there are others.

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.

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 students of the University of Minnesota or of any other institution of learning unless acceptance would be justified by exceptional circumstances.

Persons pursuing correspondence courses for credit must discontinue them when they enter school. Arrangements may be made to hold the courses over until the student is again free to pursue them.

No university student may enroll for a correspondence course for the purpose of removing a condition or a failure, except by consent of the Students' Work Committee.

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.
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

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 letters, follow-up letters. The ability to use correct English is prerequisite.
Twenty-four lessons (extension credit only). Mr. Bennett. \$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. Kuhlman. \$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. 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.

Note.—Registrations accepted after January 1, 1927.

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.

3. **Banking Practice.** The subject-matter of this course aims to present a thorough 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. Ebersole.
\$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.

Sixteen lessons (three credits). Mr. Hansen. \$10.00.

Note.—This course is undergoing revision and registrations will not be accepted until January 1, 1927.

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. Principles of Money and Banking I. This course deals with the government regulations of money, with the mechanism of the money market, the sale of securities and with the functions of trust companies, savings institutions, and commercial banks. Prerequisite: Courses 1 and 2.

Sixteen lessons (three credits). Mr. Myers. \$10.00.

12. Principles of Money and Banking II. This is a continuation of Course 11 and deals with the inter-relation of banks, government regulation of banking, the relation of business cycles to banking, the federal reserve system, farm finance, the American financial system as a whole, and the

outstanding features of certain foreign financial systems. Prerequisites: Courses 1, 2, and 11.

Sixteen lessons (three credits). Mr. Myers. \$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.)

Sixteen lessons (three credits). Mr. Vaile. \$10.00.

EDUCATION

NOTE.—See Courses 1 and 2 under Psychology.

2. 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.

Sixteen lessons (three credits). Mr. White. \$10.00.

3. History of Education to the Reformation. An 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.
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.

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 com-

munication. 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: Rhetoric 1, 2, and 3 or equivalent.
- 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: Course 1 or equivalent.
- 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: Courses 1 and 2 or equivalent.
- Sixteen lessons (three credits). Miss Grandy. \$10.00.
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 Literature*. Prerequisite for credit: Courses 1, 2, and 3 or equivalent.
- 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. Prerequisite for credit: Courses 1, 2, 3, and 4.
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: Courses 1, 2, and 3 or equivalent.
Twenty-four lessons (four and one-half credits). Mr. Sutcliffe. \$15.00.

Rhetoric

- 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. Rhetoric 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 Rhetoric 4-5-6 in the College of Science, Literature, and the Arts. Rhetoric 1, 2, and 3 and Survey of English Literature 1, 2, and 3 fulfill the freshman English requirement.
Sixteen lessons (three credits). Miss Stevens. \$10.00.
2. Rhetoric II. Continuation of Course 1. Advanced work in composition, with practice in writing exposition, narration, and description.
Sixteen lessons (three credits). Miss Stevens. \$10.00.
3. Rhetoric III. Continuation of Course 2. Advanced work in analysis, with practice in writing exposition and informal argument.
Sixteen lessons (three credits). Miss Stevens. \$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 thorough study and application of the principles of descriptive writing. Analysis of specimens and exercises in description. Prerequisite for credit: Courses 1, 2, and 3.
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.
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. Prerequisite for credit: Courses 1, 2, 3, 4, 7, and 8.
Sixteen lessons (three credits). Mr. Nichols. \$10.00.
10. Versification II. A continuation of Course 9. Prerequisite for credit: Courses 1, 2, 3, 4, 7, 8, and 9.
Sixteen lessons (three credits). Mr. Nichols. \$10.00.

GERMAN

- 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 1.
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. Lussy. \$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. Lussy. \$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.

* May be taken for one entrance credit.

- 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 from general works on biology, anatomy, physiology, and hygiene. 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. 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.
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.

* May be taken for one entrance credit.

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. \$10.00.

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). Mr. Tohill. \$12.50.
Part B, twenty lessons (one entrance credit). Mr. Tohill. \$12.50.

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 inter-relation of politics with the artistic and literary development, and finally the conquests of Alexander and the diffusion of Greek civilization over the East.
Twenty-four lessons (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.

* For Economic History I and II see page 19.

7. The Middle Ages (800-1500). A study of western European history from the time of Charlemagne to the end of the fifteenth century.
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.
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.
Twenty-seven lessons (five credits). Mr. Perry. \$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.
Twenty-seven lessons (five credits). Mr. Perry. \$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.
Twenty-four lessons (four and one-half credits). Mr. Perry.
\$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.
Twenty-four lessons (four and one-half credits). Mr. Perry.
\$15.00.
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.
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 struggle 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.

HOME ECONOMICS

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.

NOTE.—Registrations for Household Management will be accepted after December 1, 1926.

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.

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 of style in straight news-writing, and the structure of news stories, based upon the study of newspapers. Sixteen lessons (three credits). Mr. Barlow. \$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. Barlow. \$10.00.

* Offered to residents of Minnesota only.

† No cred: will be given until Courses 1, 2, and 3 are completed.

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. Barlow. \$10.00.
4. Editing I. The reading and preparation of copy for the printer; libel; study of type as applied to newspaper-making. Course in reporting or six months practical experience in reporting is a prerequisite.
Sixteen lessons (three credits). Mr. Barlow. \$10.00.
5. Editing II. Writing of headlines; headline design and typography; handling of all kinds of copy; press associations and syndicates.
Sixteen lessons (three credits). Mr. Barlow. \$10.00.
6. Editing III. Newspaper make-up, content, departments, typography; practice in handling copy and making up newspaper pages; rewrite and follow stories; the work of various editors; office system.
Sixteen lessons (three credits). Mr. Barlow. \$10.00.
- *20. Editorial-Writing I. Study of the style and structure of editorials; practice in writing various types of editorials.
Sixteen lessons (three credits). Mr. Barlow. \$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 (three credits). Mr. Barlow. \$10.00.
- †55. Newspaper and Magazine Articles I. A study in the writing of fact and opinion 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: One year of Reporting.
Eleven lessons (two credits). Mr. Steward. \$7.00.
- †56. Newspaper and Magazine Articles II. A continuation of I, including a study of typical first-class magazines and newspapers, both of specialized and general interest, including trade publications.
Eleven lessons (two credits). Mr. Steward. \$7.00.
- †57. Newspaper and Magazine Articles III. A continuation of the two former courses, including a consideration of the illustration, preparation, and selling of manuscripts.
Eleven lessons (two credits). Mr. Steward. \$7.00.

‡ No credit will be given until Courses 1, 2, and 3 are completed.

* Both parts must be completed before credit will be given for a degree.

† At least two of these courses (numbers 55, 56, and 57) must be taken before credit is granted for either. All are primarily courses in *writing* the article, and success in them depends principally on one's performance in producing articles.

LATIN

- *1. Beginning Latin I. Inflections; translation of easy Latin prose; the study of elementary syntax; Latin composition. Textbook: Bennett, *First Year Latin*.
Twenty-seven lessons (five credits). Mr. Cram. \$17.00.
- *2. Beginning Latin II. A continuation of Course 1. 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; 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*.

* May be taken for one entrance credit.

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.

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

† See also Engineering, Courses 1, 2, 19.

view of the subject by practice in special proofs and original exercises.
Prerequisites: Courses 3, 4, or equivalent.

Twenty-four lessons (one entrance credit). Mr. Edwards. \$15.00.

Note.—Courses 2 and 5 satisfy the requirements of the School of Mines 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.

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, and solution of numerical higher equations.

Twenty-seven lessons (five credits). Mr. Teeter. \$17.00.

Note.—Courses 6 and 7 satisfy the requirements of the School of Mines 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.

Note.—Course 8 satisfies the requirement of the School of Mines course, Mine Plant 4.

9. Plane Analytic 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. 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.

Note.—Course 9 satisfies the requirement of the School of Mines course, Mine Plant 5.

* May be taken for one entrance credit.

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.

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.

Twenty-seven lessons (five credits). Mr. Edwards. \$17.00.

Note.—Courses 10 and 11 satisfy the requirements of the School of Mines 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.

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 residence 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.

Note.—Registrations will be accepted after November 1, 1926.

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.

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. One year of high school physics is prerequisite.

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.

Sixteen lessons (three credits). Mr. Edwards. \$10.00.

3. Optics. An elementary university course in the fundamental principles of light. Prerequisite: Course 1.

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.

Sixteen lessons (three credits). Mr. Edwards. \$10.00.

* Courses in physics carry no pre-medic credit. All applications for college physics are subject to approval by the Department of Physics.

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. Harrison. \$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. 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). \$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). Mr. Harrison. \$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.

Twenty-seven lessons (five credits). Mr. Gaus. \$17.00.

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 I and 2.

Sixteen lessons (three credits). Mr. White. \$10.00.

Note.—See also Education, Course 2.

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, 3, and 4.
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.

* May be taken for one entrance credit.

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 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. Sirich. \$17.00.
- *2. Beginning Spanish II. A continuation of Course 1.
Twenty-seven lessons (five credits). Mr. Sirich. \$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. Sirich. \$17.00.
- *4. Intermediate Spanish II. A continuation of Course 3. Prerequisite: Courses 1, 2, and 3.
Twenty-seven lessons (five credits). Mr. Sirich. \$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 I, which is prerequisite.
Twenty lessons (four credits). Mr. Bothne. \$13.50.

* May be taken for one entrance credit.

- *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.
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.

* May be taken for one entrance credit.

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.

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.
2. 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.
3. Principles of Social Work. A study of the historical background and development of social work; its various divisions and their inter-relations; national, state, and local organizations and institutions. Prerequisite: Course 1.
Sixteen lessons (three credits). Mrs. Doyle. \$10.00.
10. 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 2 (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.

11. 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.

14. 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.

52. Field Work in Rural Sociology. Students who have completed the work in Rural Sociology (Sociology 2) 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.

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.

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First Term June 18 to July 31
Second Term July 31 to September 4



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CALENDAR
SUMMER SESSION 1926

June	18-19	Fri.-Sat.	Registration day, first term
June	21	Monday	First term classes begin
July	5	Monday	A holiday (Sunday, July 4, Independence Day)
July	31	Saturday	First term closes
July	31	Saturday	Registration for second term closes
August	2	Monday	Second term classes begin
September	4	Saturday	Second term closes

THE SUMMER SESSION

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(See under School of Business.)

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 Abe Pepinsky, Instructor

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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 extra 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.

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 18, and closes Saturday, July 31. The second term, of five weeks, begins Saturday, July 31, and closes Saturday, September 4.

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 1925-26, pages 13-21; 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 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 (alho 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, by the best available companies, are given weekly, and 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.

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.

The Minnesota Union cafeteria will be open during the Summer Session, for both men and women.

Room 202, Administration Building, University Farm, is used as a reading room and social room for men students on the University Farm campus.

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.

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 is conducted 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. The Health Service operates, exclusively for students, a general infirmary in addition to dispensary clinics in medicine, surgery, dermatology, ophthalmology, oto-laryngology, and dentistry.

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 by tickets issued from the registrar's office at University Farm.

Students who attend classes on the Minneapolis campus and who live in the College of Agriculture dormitories will also be given free transportation on the inter-campus car line.

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 new 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 dates of the examinations will be July 26, 27, 28, and 29.

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 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. Mary E. Staples, 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.

MEN'S COTTAGES

The University operates five cottages for the accommodation of men students. Room rental for the Summer Session will be \$15 to \$21 for the first term, and \$13 to \$18 for the second term. The dining hall is not open in summer. For reservations, apply to Mrs. Mary E. Staples, 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, in the Farm campus Administration Building. 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 19. 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, fourth floor, new Administration Building.

THE INSTITUTE OF CHILD WELFARE

Great interest is being manifested in the recent development of work on the care and training of children of pre-school age. The University of Minnesota, with the aid of a grant from the Laura Spelman Rockefeller Memorial maintains an Institute of Child Welfare, which will continue for the first term of the Summer Session. Four courses for credit and one course without credit will be offered by the members of the institute staff.

For further information see the section on the Institute of Child Welfare, page 110.

THE AMERICAN INSTITUTE OF CO-OPERATION

A new and promising educational venture is the American Institute of Co-operation. It held its first sessions at the University of Pennsylvania during the summer of 1925. It will hold its second annual sessions at the University of Minnesota, from June 21 to July 17, 1926. Members of the university faculty combine with members of the institute faculty in giving a rich program of courses covering the various aspects of the co-operative movement. Credits in the University are allowed under certain conditions to members of the institute.

For details, see the Department of Agricultural Economics in the College of Agriculture, Forestry, and Home Economics.

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 18, 9 a.m. to 4 p.m., and
Saturday, June 19, 9 a.m. to 3 p.m.

For the second term, Saturday, July 31, 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 21..... \$2.00
Tuesday, June 22..... 3.00
Wednesday, June 23 .. 4.00
Thursday, June 24..... 5.00

No registrations are allowed for the first term after Thursday, June 24, 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 2..... \$2.00
Tuesday, August 3..... 3.00
Wednesday, August 4.. 4.00

No registrations will be accepted later than Wednesday, August 4, 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 secure their registration blanks at the office of the registrar, Minneapolis campus. 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.

FEEES

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 71.

For fees for students registering for clinical courses in the College of Dentistry, see page 87.

For fees for students registering for music courses, see page 42.

For fees for students registering for the eight weeks' course in civil engineering, see page 51.

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 26, no refunds will be granted for the first term. After Saturday noon, August 7, 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 following in addition to tuition: health fee, Minnesota Union or Shevlin Hall fee, recreation fee, and post-office box rental. For regular students in Medicine and Dentistry, special fees covering these items are 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 29, 1926.

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, references 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, prerequisites, classes of students eligible, class hour, days of the week, and

location of the class. Thus (3 cred.; jr., sr., grad.; MTWThF II; 117F) means that the course carries three credits, is open to juniors, seniors, and graduate students, 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
C, Chemistry Bldg	Lib, New Library Bldg	Phm, Pharmacy Bldg
D, Dentistry Bldg	M, Mines Bldg	Psy, Psychology Bldg
E, Main Engineering Bldg	MA, Mechanic Arts Bldg	SBH, State Board of Health Bldg
Ed, Education Bldg	ME, Mechanical Engineering Bldg	Sh, Shevlin Hall
EE, Electrical Engineering Bldg	MGH, Minneapolis General Hospital	SS, Storehouse and Shops
EMH, Elliot Memorial Hospital	MH, Millard Hall	UD, University Dispensary (Basement MH)
	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	Ho, Home Bldg	Ve, Veterinary Bldg
En, Engineering Bldg	Hr, Horticulture Bldg	WH, Women's Hall
	Pe, Fendergast 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 Hall
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 sections 42, 43, on page 14 of Part I of 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 the Puget Sound Biological Station or at any other accredited seaside station.

FIRST TERM

- 1su.¹ 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, IV; lab., II, III; lab., 101, lect., 211AB.) Mr. Ringoen.
- 2su.¹ General Zoology. A continuation of Course 1su. (5 cred.; all; prereq., I; MTWThF, lect., III, IV; lab., I, II; lab., 101, lect., 201AB.) Mr. Minnich.

¹ A laboratory fee of \$1.50 is charged for this course.

- 117su. Ecology of Insects. General principles of ecology, with special reference to insects. Lectures, laboratory, assigned reading, and field work. (3 cred.; jr., sr., grad.; prereq., 15 credits in zoology; MWF VI, VII, VIII, IX; lab. and lect.; 212AB.) Mr. King.

SECOND TERM

- 2su.¹ General Zoology. Continuation of Course 1su. (5 cred.; all; prereq., Course 1su or equiv.; MTWThF I, II, III, IV; lab., 101, lect., 211AB.) Mr. Ringoen.

ANTHROPOLOGY

FIRST TERM

- 51su. Introduction to Anthropology. The early history of man. (3 cred.; jr., sr.; no prereq.; MTWThFS II; 15F.) Mr. Wallis.
- 110su. Physical Anthropology. The physical types of man, prehistoric and contemporary. (3 cred.; jr., sr., grad.; prereq., 51 or permission of instructor; MTWThFS I; 12F.) Mr. Wallis.

SECOND TERM

- 54su. Cultural Anthropology. Social organization of primitive peoples. (3 cred.; jr., sr.; prereq., 51 or permission of instructor; MTWThFS II; 15F.) Mr. Wallis.

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.
- 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.

SECOND TERM

- 11su. Descriptive Astronomy. Same as first term.
- 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.

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. MTWThF I, II; 10 additional hours for lab., forenoon or afternoon to be arranged; lab. 212, lect. 214P.) Mr. Dopp, Miss Goering.

¹ A laboratory fee of \$1.50 is charged for this course.

- 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. MTWThF III, IV; 10 additional hrs. for lab., forenoon or afternoon to be arranged with the class; lab., 212, lect., 214P.) Mr. Dopp, Miss Goering.
- 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 cred.; no prereq.; MTWThF VI-VII; 214P.) Miss Mygrant.
- 51su.¹ Histological Methods. Methods of preparing plant tissue for microscopic study. The needs of botany teachers will be considered particularly. (3 cred.; prereq., a course in elementary botany or equiv.; MTWThFS I-II; 213AB.) Miss Thompson.
- 61su.¹ Teachers' 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 equiv.; MTWThF I, II; 208, 210AB.) Miss Mygrant.
- Courses in algae to be adapted to needs of individual students, as arranged.
- 12su.¹ Morphology of Algae. (3 cred.; all; prereq., 2; ar.; 202AB.) Miss Tilden.
- 124su.¹ Green Algae. (3 cred.; jr., sr., grad.; prereq., 15 cred.; ar.; 202AB.) Miss Tilden.
- 126su.¹ Red Algae. (3 cred.; jr., sr., grad.; prereq., 15 cred.; ar.; 202AB.) Miss Tilden.
- 212su.¹ Research Problems in Algae. (Primarily for graduate students; ar.; 202AB.) Miss Tilden.

ECONOMICS

FIRST TERM

- 3su. 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. (3 cred.; no prereq.; MTWFS III, and Th ar.; 6B.) Mr. Stead.
- 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. Taylor.

¹ A laboratory fee of \$1.50 is charged for this course.

- 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 IV; 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.; MTWThFS I; 102B.) Mr. Garver.
- 130su. Cost Accounting. General survey of principles and methods of cost accounting with some practice in cost routines, applications of cost accounting to problems of management. (3 cred.; prereq., 25-26; jr., sr., grad.; MTWThFS V; 302B.) Mr. Heilman.
- 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.; MTWThFS III and 1 hr. ar.; 102B.) Mr. Cummings.
- 154su. Public Utilities. Economic characteristics of public utilities; relation of utilities to urban growth; principles of regulation, especially rate-fixing; regulatory policies of certain states and municipalities; public ownership. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; MTWThFS II; 102B.) Mr. Garver.
- 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; 102B.) Mr. Stead.
- 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; 202B.) Mr. Hansen.
- 170su. Modern Economic Reform Movements. The single tax, copartnership, co-operation, labor banks, anarchism, syndicalism, socialism, unionism and labor parties. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; 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 II; 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 IV; 202B.) Mr. Blakey.
- 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 financing, the shifting and incidence of taxes and fiscal reforms. (3 cred.; jr., sr., grad.; prereq., 4 or 6-7; MTWFS III, and 1 hr. ar.; 202B.) Mr. Blakey.

SECOND TERM

- 7su. Principles of Economics. A continuation of Course 6su. (3 cred.; prereq., 6; soph., jr., sr.; MTWFS II; 202B.) Mr. Waite.
- 85su. Principles of Marketing. A general course dealing with the mechanism and operation of markets: classification, organization, market agencies as factors in production. The price-making process: control of supply, assumption of risk, incidence of marketing costs. Wastes of competition. (3 cred.; prereq., 4 or 6-7; jr., sr.; MTWFS III and 1 hr. ar.; 202B.) Mr. Vaile.
- 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. Waite.
- 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, 4, or 6-7; jr., sr., grad.; MTWThFS IV; 202B.) 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.; MTWFS III and 1 hr. ar.; 102B.) 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.

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; 303, 305F.) Mr. Briggs, 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.;² Sec. 1, MTWThFS I; 204 F; Sec. 2, MTWThF VII and 1 hr. ar.; 306F.) Miss Armstrong, Mr. Loveland.
- 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; 204F; Sec. 2, MTWThF VI and 1 hr. ar.; 204 F.) Mr. Wedel, Mr. Hessler.
- 45su. American Literature. Facts and backgrounds of American literature in the seventeenth and eighteenth centuries. This course carries university credit for the second quarter of English 44-45. (3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.;² MTWThFS IV; 204F.) Miss Jackson.
- 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.;² MTWThFS III and 1 hr. ar.; 213F.) Mr. Ruud.
- 53su. Seventeenth-Century Lyricists. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier schools of poetry. (3 cred.; jr., sr.; prereq., A-B-C or equiv.;² MTWThFS II; 205F.) Mr. Moore.
- 62su. Milton, with some consideration of his contemporaries. (3 cred.; jr., sr.; prereq., A-B-C or equiv.;² MTWThFS I; 205F.) Miss Nicolson.
- 67su. English Novel. A continuation of 66su. Development of the English novel from Scott or Conrad. (3 cred.; jr., sr.; prereq., A-B-C or equiv.;² MTWThF VII and 1 hr. ar.; 205F.) Mr. Wedel.
- 107su. Eighteenth-Century Prose. Special study of fiction and the essay. (3 cred.; jr., sr., grad.; prereq., Courses 6 and 8, or either 6 or 8 and one other course numbered above 5; MTWThFS IV; 205F.) Mr. Moore.

² A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1-2-3 and 9 credits in composition.

- 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.; 205F.) Miss Nicolson.
- 129su. Modern Drama. Contemporary drama from 1870 to the present. (3 cred.; sr., grad.; prereq., Courses 6 and 8, or either 6 or 8 and one other course numbered above 5; MTWThF VII and 1 hr. ar.; 204F.) Mr. Job.
- 136su. Advanced Shakespeare. Shakespeare's development traced to the end. A careful analysis of four plays. Problems in the interpretation of Shakespeare's dramatic methods. (3 cred.; jr., sr., grad.; prereq., grade of B in English 8; MTWThFS I; 213F.) Mr. Ruud.
- 150su. Victorian Poetry. The poetry of the Victorian era, aside from Browning's and Tennyson's. The principal names are: Matthew Arnold, the Rossettis, FitzGerald, Morris, Swinburne, and Meredith. (3 cred.; jr., sr., grad.; prereq., Courses 6 and 8, or either 6 or 8 and one other course numbered above 5; MTWThF VI and 1 hr. ar.; 205F.) Mr. Job.
- 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 II; 306F.) Miss Jackson.
- 152su. Pre-Elizabethan Drama. The late medieval and the Renaissance drama, moralities, interludes, and farces up through the earlier years of the Elizabethan period. This course carries university credit for the first quarter of English 152-153. (3 cred.; jr., sr., grad.; prereq., 8, and one other course numbered above 5; MTWFS III and 1 hr. ar.; 204F.)

SECOND TERM

- 2su. English Survey. See First Term, Course 2su. (3 cred.; soph., jr., sr.; prereq., 9 cred. in comp.; MTWThFS II; 305F.) Mr. Bender.
- 3su. English Survey. See First Term, Course 3su. (3 cred.; soph., jr., sr.; prereq., 9 cred. in comp.; MTWThFS IV; 305F.) Mr. Ewing.
- 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.;² MTWThFS II; 303F.) Mr. Nichols.
- 44su. American Literature. This course carries university credit for the first quarter of English 44-45. (3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.;² MTWThFS IV; 303F.) Mr. Nichols.
- 66su. English Novel. Development of the English novel from Malory to Scott. (3 cred.; jr., sr.; prereq., A-B-C or equiv.;² MTWThFS I; 303F.) Mr. Sutcliffe.
- 110su. Romantic Poets. A continuation of 109su. (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. Sutcliffe.

² A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1-2-3 and 9 credits in composition.

COURSES IN COMPOSITION

FIRST TERM

- Asu. Freshman English. 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; MTWThF VII; Sec. 1, 303F; Sec. 2, 305F.) Mr. Briggs, Mr. Creamer.
- 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; 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; 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; Sec. 1, 303F; Sec. 2, 305F.) Mr. Briggs, 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; 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; 311F.) Mr. Richardson.
- 12su. Narration. 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 IV; 306F.) Mr. Loveland.
- 67su. Imitative Writing. The principles of structure, diction, and style, which underlie the work of leading English writers; application of these principles in both imitative and original composition. This course carries university credit for the first quarter of Comp. 67-68. (3 cred.; jr., sr.; prereq., average of B in two quarters of either 11-12, 20 or 18-19, 20;¹ MTWThFS III and 1 hr. ar.; 306F.) Miss Armstrong.

SECOND TERM

- Bsu. Freshman English. See First Term, Course Bsu. (5 cred.; all; prereq., English A; MTWThFS II; MTWThF VI; 305F.) Mr. Bender.
- Csu. Freshman English. See First Term, Course Csu. (5 cred.; all; prereq., English A, B; MTWThFS IV; MTWThF VII; 305F.) Mr. Ewing.

¹ The student who gets an average of B in 11-12 or 18-19 need not take Course 20.

- 5su. Composition for Technical Students. See First Term, Course 5su. (3 cred.; all; prereq., Comp. 4; MTWThF VI; 305F.) Mr. Bender.
- 6su. Composition for Technical Students. See First Term, Course 6su. A continuation of 5su. (3 cred.; all; prereq., Comp. 4, 5; MTWThF VII; 305F.) Mr. Ewing.
- 20su. Informal Exposition. Description and narration as methods of exposition; the informal essay. (3 cred.; soph., jr., sr.; prereq., 11-12 or 18-19; MTWFS III and 1 hr. ar.; 305F.) Mrs. del Plaine.
- 68su. Imitative Writing. A continuation of 67su. This course carries university credit for the second quarter of Comp. 67-68. (3 cred.; jr., sr.; prereq., Comp. 67; MTWThFS I; 305F.) Mrs. del Plaine.

COURSES IN PUBLIC SPEAKING

FIRST TERM

- Voice and Speech Correction. A special course, open to all students, for the correction of such disorders as wrong placement, faulty resonance, huskiness, indistinctness, and vocal fatigue. All students in public speaking required to attend. (No cred.; all; no prereq.; TTh IX; 308F.)
- 41su.¹ Public Speaking. Effective speaking, breathing, voice production, enunciation, and action; delivery of selections from the works of well-known writers and speakers; principles of speech making applied in both oral and written compositions. Voice and speech correction. 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 IV, 308F; Sec. 3, MTWThF VI and 1 hr. ar., 308F ar.) Mr. Morse.
- 42su.¹ Public Speaking. 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 ar.)
- 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 41; MTWFS III and 1 hr. ar.; 301F ar.)
- 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.
- 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; MTWFS III and 1 hr. ar.; 308F.) Mr. Rarig.

¹All students in public speaking are required to attend the course in Voice and Speech Correction which is listed just preceding Course 41su.

- 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 university 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.) Mr. Raines.

SECOND TERM

- 41su. Public Speaking. See First Term, Course 41su. (3 cred.; soph., jr., sr.; prereq., Eng. A-B-C, or Comp. 1-2-3 or 4-5-6; Sec. 1, MTWThFS I, 308F; Sec. 2, MTWThFS II, 308F.) Mr. Seering.
- 42su. Public Speaking. See First Term, Course 42su. (3 cred.; soph., jr., sr.; prereq., Eng. A-B-C, or Comp. 1-2-3 or 4-5-6, and 41; MTWThFS III and 1 hr. ar.; 308F.) Mr. Holmes.
- 59su. 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. (3 cred.; jr., sr.; no prereq.; MTWThF I; 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.; MTWThF II; 103OL.) Mr. Davis and assistant.

GEOLOGY

FIRST TERM

- 1su. General Geology. An introduction to the study of geology. Lectures with a limited amount of laboratory work and field excursions. (5 cred.; all; no prereq.; TWThFS I-II; 110P.) Mr. Stauffer.

¹ All students in public speaking are required to attend the course in Voice and Speech Correction which is listed just preceding Course 41su.

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; 209½F.) Mr. Lussky.
- 3su. Beginning C. Selected texts from modern writers. (5 cred.; all; prereq., 2 or equiv.; MTWThF I-II; 209F.) Mr. Kroesch.
- 4su. Rapid Reading. Modern narrative prose. (5 cred.; all; prereq., 3 or equiv.; MTWThF III-IV; 209F.) Mr. Davies.
- 63su. Modern Drama. Selected plays of modern dramatists. (3 cred.; jr., sr.; prereq., 4 or 8 or equiv.; MTWThFS III; 209½F.) Mr. Lussky.
- 116su. Wolfram von Eschenbach's Parzival. Readings from the poem in the original together with a critical study of the development of the Arthurian and Grail romances. (3 cred.; sr., grad.; prereq., 14 senior college cred.; ar.; ar.)
- 164su. German and English Literary Relations in the Seventeenth Century. (3 cred.; sr., grad.; prereq., 14 senior college 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

- 3su. Modern World, 1871-1925. A survey of the leading political, social, and economic phases of this period, stressing those which were most influential in producing the modern world. (5 cred.; fr., soph., jr., sr.; no prereq.; MTWThF IV-V; 112OL.) Mr. Peterson.
- 8su. American History, 1844-1876. (5 cred.; soph., jr., sr.; no prereq.; MTWThF VI-VII; 221OL.) Mr. Perry.
- 18su. Political History of Greece. (3 cred.; soph., jr., sr.; no prereq.; MTWThFS I; 109F.) Mr. Cram.

- 25su. World Politics. See Political Science program.
- 101su. French Revolution. A survey of the ancient régime will precede the consideration of the Revolution of 1799. (3 cred.; jr., sr., grad.; prereq., 15 cred. in history or 20 cred. in soc. sci. incl. 10 cred. in history; MTWThFS III; 112OL.) Mr. Gottschalk.
- 112su. History of American Immigration. European background and causes of immigration. European stocks in the new world. (3 cred.; jr., sr., grad.; prereq., 15 cred.; MTWThFS I; 112OL.) Mr. Stephenson.
- 119su. The Renaissance. (3 cred.; jr., sr., grad.; prereq., 15 cred.; MTWThFS II; 112OL.) Mr. Lucas.
- 120su. Medieval Civilization. Main cultural features of the period from St. Augustine to Dante—thought, politics, art, literature, commerce, and industry. (3 cred.; jr., sr., grad.; prereq., 15 cred.; MTWThFS IV; 111OL.) Mr. Lucas.
- 123su. International Organization. See Political Science program.
- 140su. Political Ideas from Locke to Modern Times. A survey of the principal political theories and philosophers of the eighteenth, nineteenth, and twentieth centuries. (3 cred.; jr., sr., grad.; prereq., 20 cred. in hist. and soc. sci.; MTWThFS IV; 211OL.) Mr. Gottschalk.
- 158su. Topics in European History. (Sr., grad.; prereq., 20 cred. in hist. incl. 1-2 or 2-3 or advanced course in history; reading knowledge of French or German. Credits and hours to be arranged.) Mr. Gottschalk.
- 168su. Topics in American Foreign Relations. (2 cred.; sr., grad.; prereq., 20 cred. in hist. incl. college course in American history; T VII-VIII, Th VII; ar.) Mr. Peterson.
- 170su. American Political Leaders. (3 cred.; sr., grad.; prereq., 20 cred. in hist. incl. college course in American history; two two-hour periods per week.) Mr. Stephenson.
- 175su. Topics in Medieval History. (Sr., grad.; prereq., 20 cred. in hist. incl. 120. Knowledge of at least high school Latin; credits and hours to be arranged.) Mr. Lucas.

SECOND TERM

- 10su. England since 1688. (3 cred.; fr., soph., jr., sr.; no prereq.; MTWThFS II; 209OL.) Mr. Barnes.
- 110su. Recent American History. (3 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci.; MTWThFS III; 112OL.) Mr. Conger.
- 152su. Topics in the History of the West. (3 cred.; sr., grad.; prereq., 20 cred. in hist. incl. college course in American history; two two-hour periods per week to be arranged.) Mr. Conger.
- 185su. Topics in Recent European History. Intensive study of selected topics in history of Europe since 1918. (3 cred.; sr., grad.; prereq., 20 cred. in hist. or pol. sci. incl. Hist. 2-3 or Pol. Sci. 25; students without reading knowledge of French or German must have permission of instructor; two two-hour periods per week to be arranged.) Mr. Barnes.

LATIN

FIRST TERM

- 73su. Advanced Grammar and Composition. (3 cred.; jr., sr.; prereq., any one of 51, 52, 53, or equiv. (with credit); without credit consult instructor; MTWThF VI; W VII; 112Ed.) Miss Denneen.
- 145su. Roman Tragedy. (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or six years of Latin (with credit); without credit consult instructor; MTWThFS II; 109F.) Mr. Cram.

LIBRARY TRAINING

Plans in library training for the summer of 1926 are incomplete at the time of going to press. For information write for special circular.

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 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; 104F.) Mr. Brink and assistant.
- 7su. College Algebra. Quadratic equations, equations in the quadratic form, simultaneous quadratic equations, graphical representation, progressions, mathematical induction, the binomial theorem, permutations, combinations, probability, determinants, and the theory of equations with special reference to graphical methods. (5 cred.; all; prereq., 5 or prep. higher algebra; MTWF III, IV, and Th IV, V; 102F.) Mr. Hart and assistant.
- 30su. Analytic Geometry. Given in the College of Engineering. See page 54.
- 50su. Calculus I. Differential calculus. (5 cred.; jr., sr.; prereq., 30; MTWThF I-II; 105F.) Mr. Underhill and assistant.
- 51su. Calculus II. Integral calculus. Given in the College of Engineering. See page 54.
- 165su.¹ Selected Topics in Advanced Mathematics. An intensive course open to juniors, seniors, and graduates, who will be guided through conferences and criticisms in the study of assigned topics. (Cred. ar.; jr., sr., grad.; prereq., 50, 51, differential and integral calculus; ar.¹)

¹ The number of credits is 3 or more according to the amount of work done. The following topics, each for at least three credits, will be given in the first term. Students interested in one or more of them should reserve the hour indicated: The Mathematics of Small Vibrations, by Mr. Brink (III hour); Limits and Series, by Mr. Hart (II hour); Differential Equations, by Mr. Underhill (I hour).

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 54.
- 51su. Calculus II. Integral calculus. (5 cred.; jr., sr.; prereq., 50; MTWThF I, II; 105F.) Mr. Underhill and assistant.
- 165su.² Selected Topics in Advanced Mathematics. (Cred. ar.; jr., sr., grad.; prereq., 50, 51, differential and integral calculus; ar.²) Mr. Underhill.

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 fee 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.) Mr. Ferguson.
- 3su. Harmony. A continuation of Harmony 1su, which offers the work of the third quarter of the regular year. (3 cred.; prereq., 1-2; MWF III-IV; 103Mu.) Mr. Ferguson.
- 13su. Class Instrument Teaching. Primarily for College of Education students. Not open to S., L. and A. students. See College of Education, page 99.
- 39su. Piano. Open to those who have mastered technical difficulties of the degree of Czerny's *School of Velocity* and the easier Haydn and Mozart sonatas. Two lessons a week. Fee, \$36. (2 cred.; ar.; Mu.) Mr. Lindsay, Miss Reeves.
- 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.; ar.; 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.

² The number of credits is 3 or more according to the amount of work done.

- 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 99.
- 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 99.
- 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. Sight Reading, Accompanying, and Ensemble Playing. 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.
- 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

- 1su. Problems of Philosophy. An introductory survey of the chief problems of philosophy, together with some of the more prominent solutions which have been proposed. (3 cred.; soph., jr., sr.; no prereq.; MTWThFS II; 322F.) Mr. Conger.
- 110su. Present Day Philosophy. An examination of the principal doctrines of contemporary philosophers, with special attention to idealism, pragmatism, realism, and naturalism. (3 cred.; jr., sr., grad.; prereq., 10 cred. in philosophy; MTWThFS V; 322F.) Mr. Conger.

SECOND 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 III; 322F.) Mr. Dubs.
- 50su. Ancient and Medieval Philosophy. An introduction to philosophy through a study of typical world views. Greek, Roman, medieval, Christian, and Renaissance. (3 cred.; jr., sr.; prereq., 6 cred. in phil.; MTWThFS IV; 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., trig. the equiv. of 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; lab., TTh, I, II; 16Ph.) Mr. Buchta.
- 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., TThS I, II; quiz, M 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; lab., WF I, II; 32Ph.) Mr. Zeleny.
- 110su. Thesis. (No cred.; ar.) Mr. Erikson, Mr. Zeleny, Mr. Buchta.
- 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.
- 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.
- 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

- 23su. Heat. A study of the principles underlying heat phenomena. Course 22 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; 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; lab., TTh I, II; 23Ph.) Mr. Miller.

¹ A laboratory fee of \$1.50 is charged for this course.

- 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; lab., WF I, II; 16Ph.) Mr. Valasek.
- 111su. Thesis. (No cred.; ar.) Mr. Miller, Mr. Valasek.
- 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.
- 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.

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.; lect., TWThF I; quiz sec., TWThF II; 211OL.) Mr. Allin.
- 11su. 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; problems of administration. (4 cred.; soph., jr., sr.; prereq., 1 or 2; TWThF I and II; 209OL.) Mr. Anderson.
- 15su. Introduction to Political Science. Introductory presentation of the problem 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; TWThF VI and VII; 111OL.) Mr. Hall.
- 25su. World Politics. A study of the foreign policies and international relations of the leading European powers today. (4 cred.; soph., jr., sr.; prereq., 1, or 10 cred. in hist.; TWThF III, IV; 209OL.) Mr. Quigley.
- 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 III; 211OL.) Mr. Anderson.
- 121-122su. International Law. Nature, sources, and sanction of international law. The laws of peace, war, and neutrality. (4 cred.; jr., sr., grad.; prereq., 20 cred. in social sciences; TWThF III, IV; 221OL.) Mr. Allin.

¹ A laboratory fee of \$1.50 is charged for this course.

- 123su. International Organization. Systems of international relations, international administrative organizations, and political guarantee of the past, with a detailed study of the League of Nations. (2 cred.; jr., sr., grad.; prereq., 20 cred. in social sciences; TWThF I; 221OL.) Mr. Quigley.
- 127su. Topics in American Foreign Relations. See History 168su.
- 181su. Modern Political Thought. See History 140su. Political Ideas from Locke to Modern Times.

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 III-IV; 211OL.) Mr. Young.
- 2su. State Government. A comparative study of American state governments. The adoption and amendment of constitutions; organizations, powers, and methods of the three departments; problems of administrative organization. (4 cred.; soph., jr., sr., and fr. with 10 cred. in hist.; no prereq.; TWThF I, II; 211OL.) Mr. Lambie.
- 3su. Comparative European Government. (4 cred.; soph., jr., sr.; prereq., I; TWThF I-II; 221OL.) Mr. Friedrich.
- 133su. Government in Minnesota. Relations of federal, state, and local governments; powers; formation of public policy; administration. (2 cred.; jr., sr., grad.; prereq., 20 cred. in social sciences; TWThF III; 209OL.) Mr. Lambie.
- 158su. 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. (2 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or approval of instructor; TWThF I; 209OL.) Mr. Young.
- 175su. Contemporary European Politics. The political aspects of the Dawes plan, including an interpretation of the Locarno Treaty. (2 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.; TWThF IV; 221OL.) Mr. Friedrich.

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, recitations, and demonstrations. (6 cred.; soph., jr., sr.; no prereq.; lect., MTWThFS V; MuAud; Sec. 1, MTWThF I; 115Psy; Sec. 2, MTWThF II; 115Psy; Sec. 3, MTWThF III; 115Psy; Sec. 4, MTWThF IV; 115Psy.) Mr. Bird, Mr. Kluver, Mr. Langlie.
- 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; 109Psy.) Mr. Toops.

- 110su. Human Motives and Incentives. The initiation and improvement of work. Rôle of habit, custom, and tradition in motivation. Incentive values of self-ratings, competition, punishment, and promotion in relation to the capacities of individuals. (3 cred.; jr., sr., grad.; prereq., elementary psychology and either elementary economics or an advanced course in psychology or educational psychology; MTWThFS IV; 109Psy.) Mr. Toops.
- 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. Toops, Mr. Bird.
- 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.

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.) Miss Heidbreder, Mr. Jacobsen.

ROMANCE LANGUAGES

FIRST TERM

COURSES IN FRENCH

- 1su. Beginning Course. Pronunciation, grammar, reading, conversation, and composition. (4 cred.; all; no prereq.; TWThF III-IV; 201F.) Mr. Searles.
- 3su.¹ Intermediate Course. Reading of representative modern authors; review grammar, composition, Equivalent either to Fr. 3 or to Fr. 4. (4 cred.; all; prereq., 1-2, TWThF I-II; 202F.) Mr. Barton, Mr. Sirich.
- 20su. Oral and Written French. Conversation and composition. (2 cred.; all; prereq., 4; TWThF V; 201F.) Mr. Sirich.
- 103su. French Syntax and Composition. 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.
- 125su. Rousseau. Lectures, readings, discussion. (2 cred.; jr., sr., grad.; prereq., 21-22-23; TWThF IV; 203F.) Mr. Sirich.
- 130su. Molière. Readings, discussions. (2 cred.; jr., sr., grad.; prereq., 21-22-23; TWThF I; 203F.) Mr. Searles.
- 159su. French Romantic Drama. Lectures, readings, discussion. (2 cred.; jr., sr., grad.; prereq., 21-22-23; TWThF III; 203F.) Mr. Barton.

¹ The number of registrations will determine whether Intermediate French or Intermediate Spanish will be given.

COURSES IN SPANISH

- 1su. Beginning Course. Pronunciation, grammar, reading, conversation, composition. (5 cred.; all; no prereq.; TWThF III-IV; 227F.) Miss Nissen.
- 3su.¹ Intermediate Course. Reading of representative modern authors; review grammar, composition. Equivalent either to Sp. 3 or to Sp. 4 (4 cred.; all; prereq., 1-2; TWThF I-II; ar.)

COURSES IN FRENCH

SECOND TERM

- 128su. French Romanticism. (4 cred.; jr., sr., grad.; prereq., 21-22-23; MTWF III; MTWTh IV; 203F.) Mr. Searles.
- 135su. Racine. (2 cred.; jr., sr., grad.; prereq., 21-22-23; MTWTh II; MTWTh II; 203F.) Mr. Searles.

SCANDINAVIAN

FIRST TERM

- 1su. Beginning Norwegian. Grammar, composition, select readings in easy prose and poetry. (5 cred.; all; no prereq.; MTWThF I-II; 206F.) Mr. Bothne.
- 110su. Ibsen. Lectures, reading, and interpretation. (3 cred.; sr., grad.; prereq., 101-102-103; MTWThFS III; 206F.) Mr. Bothne.

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.; Sec. 1, MTWThFS I; 3F; Sec. 2, MTWThFS II; 3F.) Mr. Mehus.
- 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. 1; MTWThFS IV; 5F.) Mr. Phelps.
- 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. 1; MTWThFS III; 5F.) Mr. Murchie.
- 45su. Social Statistics. Statistical method applied to the study of population and problems of group living. Especially designed to give social workers and public health officers the training necessary to carry on

¹The number of registrations will determine whether Intermediate French or Intermediate Spanish will be given.

- their work successfully. (3 cred.; soph., jr., sr.; prereq., Soc. I; MTWThFS II; 5F.) Mr. Markey.
- 51su. The Socially Inadequate. The occurrence of the socially inadequate; discussion of causative factors; outline of plans and theory of treatment. (3 cred.; jr., sr.; prereq., 10 cred. in soc., or Soc. I and 10 cred. in soc. sci. or psy.; MTWThFS I; 5F.) Miss Wheeler.
- 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.)
- 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.)
- 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.)
- 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. I and 15 cred. in soc. sci., ed., phil., or psy.; MTWThFS III; 15F.) Mr. Sorokin.
- 119su. The Family. The evolution of the family; its various forms and their relation to the other social institutions; the rôle of the family in social evolution; contemporary problems of the family. (3 cred.; jr., sr., grad.; prereq., same as 101; MTWThFS II; 3F.) Mr. Elmer.
- 122su. Methods of Social Investigation. A study of progress in methods of social investigation; a critical study of the scientific method applied to social phenomena; survey of some specific problems; field work and analysis of material. (3 cred.; jr., sr., grad.; prereq., same as 101; MTWThFS I; 3F.) Mr. Elmer.
- 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.)
- 158su. Sociology of Revolution, with special reference to the Russian situation. (3 cred.; jr., sr., grad.; prereq., same as for 101; MTWThFS IV; 6F.) Mr. Sorokin.
- 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 III; 6F.) Mr. Streightoff.

- 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.
- 221su. Graduate Field Work. (Ar.)

SECOND TERM

- 1su. Same as course given first term. (I; 3F.) Mr. Markey.
- 6su. Same as course given first term. (IV; 3F.) Mr. Clarke.
- 14su. Same as course given first term. (III; 3F.) Mr. Lundquist.
- 102su. Social Control. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of social controls under the influence of modern science. (3 cred.; jr., sr., grad.; prereq., same as 101; MTWThFS IV; 3F.) Mr. Streightoff.
- 103su. Sociology of Conflict. An appraisal of competition, combat, and cooperation; causes, manifestations, results, and cures of conflict between nations, races, religions, and economic and social classes. (3 cred.; jr., sr., grad.; prereq., same as 101; MTWThFS III; 6F.) Mr. Clarke.
- 153-154-155su. Same as first term. (Ar.)
- 158su. Same as course given first term. (MTWThFS I; 6F.) Mr. Sorokin.
- 159su. Social Mobility and Processes. (3 cred.; jr., sr., grad.; prereq., two courses in soc.; MTWThFS II; 6F.) Mr. Sorokin.
- 200su. Graduate Seminar. Same as first term. Staff.
- 221su. 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.) 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. Wilson.
- 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. Wilson.
- 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. Wilson.
- 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

- 31su. Stresses in Structures. Algebraic and graphic analysis of various types of roof and bridge trusses for fixed loading. (3 cred.; jr. C.E.; prereq., M.& M. 26, Draw. 23; ar.; 229E.) Mr. Maney.
- 32su. Stresses in Structures. Moving loads and influence lines. Standard engine loadings and equivalent uniform loads. (3 cred.; jr. C.E.; prereq., C.E. 31; ar.; 229E.) Mr. Maney.

- 33su. Elementary Structural Design. Designing principles and methods. Complete design and detail drawing of framed mill building bent. (3 cred.; jr. C. E.; prereq., M.& M. 128, C.E. 32; ar.; 229E.) Mr. Maney.
- 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.
- 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. Archibald.
- 2su. Engineering Drawing. A continuation of Course 1. (3 cred.; all; prereq., Dr. 1; 2 lect., 16 hrs. lab.; ar.; 101E.) Mr. Archibald.
- 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 1; 205E; lab., 14 hrs.; ar.; 101E.) Mr. Levens.
- 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. Archibald.
- 7-8su. Engineering Drawing and Descriptive Geometry. (Chem. and Chem.E.) (3 cred. per qtr.; prereq., solid geometry.) Mr. Archibald.
- 10su. Solid Geometry. Lines and planes in space; dihedral and polyhedral angles; polyhedrons, cylinders, cones, similarity, prismoid formula, sphere area, volumes, numerical exercises in area, weights. Entrance credit for the College of Engineering and Architecture. (3 cred.; all; prereq., pl. geom.; MTWThF 1; 203E.) Mr. Levens.
- 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

¹ Eight weeks, June 21 to August 14, 1926. The registration fee for the eight weeks required for these courses is \$30. In addition the student will make the usual deposit of \$5.

- problems. (2 cred.; soph. C.E.; prereq., Dr. 3; 12 hrs.; ar.; 201E.) Mr. Myers.
- 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. Myers.
- 23su. Drafting. (C.E.) A continuation of Course 22. (2 cred.; soph. C.E.; prereq., Dr. 22; 12 hrs.; ar.; 201E.) Mr. Myers.
- 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. Myers.
- 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. Myers.
- 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. Myers.
- 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. Myers.
- 41-42-43su. Technical Drawing. Theory and practice of drawing. Sketching, lettering, tracing, conventions, renderings, blue printing, and mechanical drawing. Preparation of conventional charts and diagrams of particular interest to dentists, designed for dental students. (2-6 cred.; fr. dent.; 12 hrs.; ar.; 101E.) Mr. Williams.

SECOND TERM

- 3su. Descriptive Geometry. See statement for first term. Hours arranged. Mr. Eggers.
- 6su. Engineering 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. Potter.
- 22su. Drafting. (C.E.) See statement for first term. Mr. Potter.
- 23su. Drafting. (C.E.) See statement for first term. Mr. Potter.
- 26su. Drafting. (E.E.) See statement for first term. Mr. Potter.
- 27su. Drafting. (E.E.) See statement for first term. Mr. Eggers.
- 28su. Drafting. (M.E.) See statement for first term. Mr. Potter.
- 29su. Drafting. (M.E.) See statement for first term. Mr. Eggers.
- 41-42-43su. Technical Drawing. See statement for first term. Mr. Potter.

MATHEMATICS AND MECHANICS

FIRST TERM

- 10su. Solid Geometry. (See Drawing and Descriptive Geometry, page 52.)
- 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. Holman, Mr. Warne.
- 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. Herrick, Mr. Siler.
- 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. Priestler.

SECOND TERM

- 13su. Analytical Geometry. See statement for first term. (5 cred.; fr. eng., arch., chem.; prereq., 12; MTWF III-IV; Th IV-V; 136E.) Mr. Doeringsfeld.
- 26su. Technical Mechanics. *Statics and Kinematics*. See statement for first term. (5 cred.; soph. eng.; prereq., 25; MTWF III-IV; Th IV-V; 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. Boehnlein.

MECHANICAL ENGINEERING

FIRST TERM

WOOD-WORKING 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 wood-working 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 Wood-Working. Operation and setting up of wood-working 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.

FOUNDRY PRACTICE

- 12su. Foundry Practice for Engineering Students. Floor and machine molding; iron, brass, and aluminum casting. Inspection trips and reports. (2 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Moffett.

Special Courses for Teachers

- 22su. Foundry Methods, Principles, and Practice. A course for prospective teachers in foundry practice, in industrial arts, designed to cover the

¹ A laboratory fee of \$1.50 is charged for this course.

- fundamentals that should be taught to pupils in foundry work. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Moffett.
- 23su. Art and Ornamental Castings. Molding, casting, and finishing castings of fine detail in grey iron, aluminum, and the bronzes, including art and special bronzes for characteristic colors. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Moffett.
- 24su. Advanced Foundry Practice. Quantity production methods; match plates and molding machine. Foundry management; plant design and equipment. Foundry metallurgy. (2 to 4 cred.; prereq., 12 or equiv.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Moffett.

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; ME.) Mr. Rogers.
- 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. Rogers.

¹ A laboratory fee of \$1.50 is charged for this course.

- 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; ME.) Mr. Rogers.
- 17su. Machine Shop Practice. (Chemists and chemical engineers.) (2 cred.; no prereq., M I-IX; TWFS I-IV; Th I-II; ME.) 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.; ME.) Mr. Rogers.

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; ME.) Mr. Rogers.
- 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. Rogers.
- 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. Rogers.

SECOND TERM

WOOD-WORKING COURSES

- 111su.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 Wood-Working. 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.

MACHINE SHOP WORK

- 14su.¹ Machine Shop Practice for Mechanical Engineering Students. See statement for first term. (4 cred.; soph. mech.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Rogers.
- 15su.¹ Advanced Machine Shop Practice for Mechanical Engineering Students. See statement for first term. (4 cred.; soph. mech.; prereq., 14; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Rogers.
- 16su.¹ Elementary Machine Shop for Electrical Engineering Students. See statement for first term. (2 cred.; soph. elec.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Rogers.
- 17su. Machine Shop Practice. (Chemists and chemical engineers.) (2 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Rogers.
- 111su. Tool Construction. See statement for first term. (4 cred.; all; prereq., 7 or 14; ar.; ME.) Mr. Rogers.

Special Courses for Teachers

- 2su. Bench Work. See statement for first term. (2 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Rogers.
- 3su.¹ Elementary Machine Shop Practice. See statement for first term. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Rogers.
- 7su.¹ Advanced Machine Shop. See statement for first term. (2 to 4 cred.; prereq. 3; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Rogers.

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.

INTENSIVE TRAINING COURSE FOR TEACHERS OF VOCATIONAL AGRICULTURE

The Department of Agricultural Education of the University of Minnesota, represented by its faculty, and the State Board for Vocational Education, represented by the director of vocational education and the state supervisor of agriculture, have for several years conducted a brief Intensive Training Course for agricultural teachers in service.

A week of similar character will be conducted this year at University Farm in June.

This intensive training work will in no way supplant the regular six weeks' Summer Session, June 18 to July 31, when regular college courses in education, agricultural education, and agriculture are offered by the University.

AGRICULTURAL BIOCHEMISTRY

FIRST TERM

- 3su. 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.) Mr. Haag.
- 111su. Phytochemistry. An advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes and pigments, and their physiochemical relations to the vital processes involved in growth and nutrition. (3 cred.; sr., grad.; prereq., biol. 10 cred., org. chem.; MWF I, II; 251Ch.) Mr. Sandstrom.
- 113su.¹ Biochemical Laboratory Methods. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds with especial reference to the detection and estimation of such compounds in cells or tissues. (2 or 3 cred.; sr., grad.; prereq., quant. anal. parallel, 111-112; T I, II, III, IV; Th I, II, IV; MW III, IV; 7 Ch.) Mr. Sandstrom.
- 118asu.¹ Laboratory Problems in Biochemistry. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, in the study of biochemical reactions, and in special methods of identification or determination of biochemical products. (1½ or 2½ cred.; sr., grad.; prereq., 111-112, 113-114, or 103 or 110; ar.) Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman.
- 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,

¹ A laboratory fee of \$1.50 is charged for this course.

or human nutrition. (1½ or 2½ cred.; grad.; ar.) Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman.

SECOND TERM

- 112su. Phytochemistry. Second part of Course 111su. (3 cred.; sr., grad.; prereq., 111; MWF I, II; 251Ch.) Mr. Sandstrom.
- 114su.¹ Biochemical Laboratory Methods. Second part of Course 113su. (2 or 3 cred.; sr., grad.; prereq., 113; T I, II, III, IV; Th I, II, IV; MW III, IV; 7Ch.) Mr. Sandstrom.
- 118bsu.¹ Laboratory Problems in Biochemistry. Second part of Course 118su. (1½ or 2½ cred.; sr., grad.; prereq., 118a; ar.) Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman.
- 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

The American Institute of Co-operation will hold its sessions during the first four weeks of the first term of Summer Session. The daily program of the institute will be made up as follows:

- 8:00 to 8:50—Regular classes which may be taken with or without uni- and versity credit by members of the institute and by students 9:00 to 9:50 in the Summer Session.
- 10:00 to 12:30—General sessions of the institute available only to members of the institute.
- 2:00 to 5:30—General sessions of the institute, and conferences, available (except Sat.) only to members of the institute.
- Running parallel with classes from 8:00 to 9:50 and with afternoon sessions and conferences from 2:00 to 5:30, short courses for co-operative managers. These are available only to members of the institute.

Any person wishing to attend sessions of the institute or to enroll for courses given by members of the staff of the institute who are not members of the university faculty must become a member of the Institute of Co-operation. These courses are marked Inst. in the following description of courses. All courses will receive credit in the University of Minnesota. Persons desiring university credit for courses taken must register also in the Summer Session of the University in order that proper records may be kept. A single fee covers registration in both the institute and the Summer Session of the University. This fee is \$15 for the four weeks of the institute or \$25 for the six weeks of Summer Session.

It will be noted that a full program of credits for institute members can be obtained only by registering for the conferences (Ag. Econ. 150su.) and two of the morning classes. Each course may be taken for either 4 weeks (2 credits) or 6 weeks (3 credits). In addition one intensive course is of-

¹ A laboratory fee of \$1.50 is charged for this course.

² See also courses under School of Business, p. 108.

ferred for the last two weeks (Ag. Econ. 110). It is hoped that most of the members of the institute taking courses for credit will remain for the last two weeks of the first term of the Summer Session; and that many will also remain for the second term of the Summer Session.

By arrangement and under special conditions, credit will be allowed for two weeks of consecutive course work taken during the institute session or during the first term of Summer Session.

FIRST TERM

- Ag. Econ. 110su. Economics of Agricultural Production I. (3 cred.; jr., sr., grad.; prereq., Ag. Econ. 1 and 2, or a course in the principles of economics; MTWThFS III, IV, and MTWThF VII, for the last two weeks of the Summer Session only, following the four weeks' session of the American Institute of Co-operation. 203AE.) Mr. J. D. Black, Mr. Peterson.
- Ag. Econ. 126su. Economics of Consumption. (3 cred.; jr., sr., grad.; prereq., Ag. Econ. 1, or a course in the principles of economics. Intended especially for students in home economics; MTWThFS I; 203HE.) Mr. Waite, Mr. A. G. Black.
- Ag. Econ. 131su. Price Analysis and Policies. (4 wks. for 2 cred., or 6 wks. for 3 cred.; jr., sr., grad.; MTWThFS II; 203AE.)
- Ag. Econ. 140su. Co-operative Marketing Organization. Analysis of the business set-up of a co-operative marketing enterprise. (4 wks. for 2 cred., or 6 wks. for 3 cred.; jr., sr., grad.; MTWThFS I; 203AE.) Mr. J. D. Black, Mr. A. G. Black.
- Ag. Econ. 141su. (Inst.) Co-operative Marketing of Livestock. Analysis of livestock marketing with special reference to the application of co-operative principles and practices to it. (4 wks. for 2 cred., or 6 wks. for 3 cred.; MTWThFS I; jr., sr., grad.; 106AE.) Mr. Miller.
- Ag. Econ. 142su. (Inst.) Co-operative Marketing of Dairy Products. (4 wks. for 2 cred., or 6 wks. for 3 cred.; jr., sr., grad.; MTWThFS I; 106AE.) Mr. Horner, Mr. Ross.
- Ag. Econ. 143su. Co-operative Marketing of Grain. (4 wks. for 2 cred., or 6 wks. for 3 cred.; jr., sr., grad.; MTWThFS II; 4PP.) Mr. Price, Mr. Peterson.
- Ag. Econ. 144su. Membership and Control. (4 wks. for 2 cred., or 6 wks. for 3 cred.; jr., sr., grad.; MTWThFS I; 1PP.) Mr. Jesness.
- Ag. Econ. 145su. (Inst.) Co-operative Administration. Problems of administration of actual co-operative organizations, particularly of the central marketing organizations in the Twin Cities. (4 wks. for 2 cred., 6 wks. for 3 cred.; jr., sr., grad.; MTWThFS II; 105AE.) Mr. Miller, Mr. Leonard, Mr. McPheeters, Mr. McGuire, Mr. Montgomery, Mr. Nordby, and others.
- Ag. Econ. 146su. The Economic and Legal Foundations of Co-operation. Present economic and legal status of agricultural co-operation in the United States, with historical background. (4 wks. for 2 cred.; jr., sr., grad.; MTWThFS II; 105AE.) Mr. Nourse.

- Ag. Econ. 147su. (Inst.) History and Progress of Co-operation. (4 wks. for 2 cred., or 6 wks. for 3 cred.; MTWThFS II; 307Ad.) Mr. MacPherson.
- Ag. Econ. 148su. Co-operative Accounting. Accounting problems connected with pooling and other business practices peculiar to co-operative marketing. (4 wks. for 2 cred., or 6 wks. for 3 cred.; jr., sr., grad.; prereq., a course in principles of accounting or the equivalent thereof; MTWThFS I; 105AE.) Mr. Holt, Mr. Peterson, Mr. Robotka.
- Ag. Econ. 149su. (Inst.) Sales Promotion. (4 wks. for 2 cred.; jr., sr., grad.; MTWThFS I; 4PP.)
- Ag. Econ. 150su. (Inst.) Conferences. Discussion of problems raised in the daily morning and afternoon general sessions of the Institute of Co-operation. (4 wks. for 2 cred., or 6 wks. for 3 cred.; jr., sr., grad.; MTWTh. Hours and rooms to be arranged.) Mr. MacPherson, Mr. Nourse, Mr. Jesness, Mr. Horner, Mr. Miller, Mr. Price, Mr. Ross, Mr. Waite, Mr. A. G. Black.

SECOND TERM

- Ag. Econ. 111su. Economics of Agricultural Production II. (3 cred.; jr., sr., grad.; prereq., Ag. Econ. 1 or 2 or a course in the principles of economics, and Ag. Econ. 110 if possible; MTWThFS III; 203AE.) Mr. J. D. Black, Mr. A. G. Black.
- Ag. Econ. 135su. Price Forecasting. (3 cred.; jr., sr., grad.; MTWThF VI and one period to be arranged; 203AE.) Mr. ———, Mr. Holt.
- Ag. Econ. 190su. Agricultural Statistics. (3 cred.; jr., sr., grad.; prereq., an elementary course in statistical method desirable but not required; MWF VII, VIII; 203AE.) Mr. Waite, Mr. Peterson.
- Ag. Econ. 208. Rural Organization. (3 cred.; sr., grad.; MTWThFS IV; 203AE.) Mr. J. D. Black, Mr. A. G. Black.
- Ag. Econ. 241su. Seminar in Marketing Livestock. (3 cred.; sr., grad.; TTh VII, VIII, and another period to be arranged; 203AE.) Mr. Price, Mr. Peterson.

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. Steinmetz.
- 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 classifications are available. (3 cred.; sr., grad.; prereq., Bot. 4, 5, 6; Agron. and Farm Mgt. 121, 122, 123; MWF I, II; 2Ad.) Mr. Army.

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

- 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

- 3su.¹ Textiles. Designed better 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 clothing and household furnishings. (3 cred.; no prereq.; MTWThF I, II; 307,311HE.) (Limited to 24.) Miss Weller.
- 13su.¹ Dressmaking. Modeling, construction of wool skirt, tailored silk blouse, choice of wool service dress or wool sport suit, and a remodeling problem; consideration of textile and art applications in selection of materials and designs. (3 cred.; soph., jr., sr.; prereq., 3, 11 or its equivalent, 51; MTWFS III, IV, and 2 hrs. ar.; 304HE.) (Limited to 20.) Miss Gorham.
- 17su.¹ Advanced Clothing Construction. Laboratory problems in costume modeling and construction of children's garments. (3 cred.; jr., sr.; prereq., 13, 53; MTWFS I, II; 304HE.) (Limited to 20.) Miss Gorham.
- 19su.² Nutritional Aspects of Health. A discussion of the principles of human nutrition as they relate to the promotion of health. (2 cred.; prereq., chem. and zoology or physiology or botany. MTWTh VI; 201 WGM.) Miss Osbeck.
- 30su. Problems in Home Planning and Furnishing (for teachers). A study of the problems involved in choosing, planning, and furnishing a home. Emphasis will be placed on the choice of projects; sources for illustrative material and methods of presenting such problems to students of high school age. (2 cred.; prereq., 51 or equivalent; MTThF VI, VII; 114HE.) Miss Morse.
- 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, Econ. 5; MTWThF VIII; 106HE.) Miss Studley, Miss Osbeck.
- 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 Studley, Miss Osbeck.
- 50,51su.¹ Color and Design. Composition, perspective, color theory, and color harmonies applied to costume design and interiors; harmony,

¹ A laboratory fee of \$1.50 is charged for this course.

² Designed for experienced social workers, for school and public health nurses, teachers of physical education and home economics.

- proportion, emphasis, balance, and rhythm, in design. (5 cred.; no prereq.; MTWFS III, IV, and 2 hrs. ar., and MTWThF VI, VII and 2 hrs. ar.; 112HE.) Miss Vetta Goldstein.
- 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.
- 53su. 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 Harriet Goldstein.
- 57su. 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 Morse.
- 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 servings; study of problems involved in purchase of institution supplies. (4 cred.; jr., sr.; prereq., 22; lect., MTh II; lab., MTWFS I, II, III; 106HE.) Miss Katherine McFarland.
- 70su.¹ Food Preparation. A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. (3 cred.; soph., jr., sr.; prereq., 10 cred. in a laboratory science; MTWThF VI, VII, and 2 hrs. ar.; 207HE.) Miss Child.
- 103su.¹ Dietetics. The fundamental principles of human nutrition as applied to the feeding of individuals and groups under conditions of health and under such pathological conditions as are chiefly dependent on dietetic treatment. (3 cred.; sr., grad.; prereq., 108, 104 parallel; MWF VII, VIII; 203HE.) Miss Leichsenring.
- 104su. Field Work in Dietetics. Laboratory, case and group work in problems of feeding. (2 cred.; sr., and 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.; 203HE.) Miss Chaney, Miss Leichsenring.
- 108su. Nutrition II. Metabolism including work on tissues, blood, milk, and urine. (5 cred.; jr., sr.; prereq., 23; MTWFS I, II, III, IV; 211-213HE.) Miss Chaney.
- 111su. Special Food Problems. A continuation of experimental cookery involving more advanced problems. (3 cred.; sr.; prereq., 105; MTWThFS I, II; 107HE.) Miss Child.

¹ A laboratory fee of \$1.50 is charged with this course.

² Open to sophomores only in their third quarter.

- 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.
- 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.; hours and days ar.) Miss McNeal, Miss Chaney, Miss Leichsenring, Miss Brown.

HOME ECONOMICS EDUCATION

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 small children. Emphasis is placed on the pre-school child. Lectures, observations in the nursery school, and reports. (3 cred.; jr., sr.; prereq., Psy. 1-2; MTWF VI, and 2 hrs. observation ar.; 213HE.) (Limited to 50.) Dr. John Anderson.
- 42su.¹ Special Methods of Teaching Home Economics. Curricula, equipment, methods of teaching for home economics. Actual class work illustrating principles of teaching. (5 cred.; jr., sr.; prereq., 13, 22, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55; MTWThF VII, VIII; 213HE.) Miss Rose.
- 141su.¹ Problems in Home Economics Education. Problems of administration. Problems of administration and supervision of home economics, study of curricula for the day, part-time, and evening schools, consideration of the home project and related work. (2 cred.; sr.; prereq., 42; MTWThF V; 213HE.) Miss Clara Brown.
- 142su. Educational Measurement in Home Economics. Survey of accomplishment in this field; evaluation and construction of lists. (2 cred.; sr.; prereq., 42, Ed. Psy. 55; MTWF III; 213HE.) Miss Clara Brown. For Child Welfare Institute Courses see page 110. For Agricultural Economics Courses see page 61.

HORTICULTURE

FIRST AND SECOND TERMS

- 192su. Special Problems. A study of problems based upon work given in preceding horticultural courses. (2-4 cred.; jr., sr., grad.; ar.) Mr. Alderman, Mr. Brierley, Mr. Beaumont, Mr. Cary, Mr. Krantz.
- Thesis. Opportunity will be offered to graduate students to continue work on thesis problems throughout the summer.

¹ Prerequisites waived for teachers of home economics.

PLANT PATHOLOGY AND BOTANY

FIRST TERM

- 111su.¹ Diseases of Field Crops. Special detailed study of diseases of cereal and forage crops, including symptomatology, etiology, and practical methods of control. Laboratory, lecture, and greenhouse work. (3 cred.; jr., sr.; prereq., 1; ar.; 1, 2PP.) Mr. Stakman, Mr. Henry, Mr. Christensen.
- 112su.¹ Diseases of Fruit Crops. Special study of diseases of fruit crops, especially those important in Minnesota. Laboratory, lecture, and greenhouse work. (3 cred.; jr., sr.; prereq., 1 or 10; ar.; 1, 2PP.) Mr. Leach.
- 113su.¹ Diseases of Vegetable Crops. A detailed study of diseases of potatoes and other vegetable crops. Lecture, reference, laboratory, and greenhouse work. (3 cred.; jr., sr., prereq., 1 or 10; ar.; 1, 2 PP.) Mr. Leach.
- 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.

SECOND TERM

- 206su. Special Problems. Continuation of same course offered in first term. Mr. Stakman.

¹ A laboratory fee of \$1.50 is charged for this course.

THE LAW SCHOOL

A number of courses will be offered by the Law School faculty for the summer quarter, June 21 to September 4, 1926. The quarter will be divided into two terms, the first from June 21 to July 31, and the second from August 2 to September 4. 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 quarter courses in law are 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 accelerate graduation. 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. Students who wish to plan a course for this degree should consult the dean.

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

Public Utilities. Origin of common callings, peculiar duties and liabilities incident thereto, the modern law applicable to those engaged in public service, particularly common carriers, with special reference to the Interstate Commerce Act and similar state statutes. Textbook to be announced. (MTWTh 8:00-9:00.) Mr. Rottschaefer.

Quasi Contracts. Nature and scope of quasi contracts, benefits voluntarily conferred by mistake, in partial performance of a contract, in the absence of a contract; benefits conferred under duress; waiver of tort. Thurston, *Cases in Quasi Contracts*. (TWThF 9:00-10:00.) Mr. Fletcher.

Interstate Commerce. The Interstate Commerce Act as amended and the Transportation Act of 1920; the scope of commerce regulated; the duties of carriers under the acts; the functions of the Interstate Com-

¹ These fees include the following in addition to tuition: health fee, Minnesota Union or Shevlin Hall fee, recreation fee, and post-office box rental. In addition a general deposit of \$5 is charged, part of which is returned.

merce Commission and Railroad Labor Board; the function of courts in the enforcement of the acts. Frankfurter, *Cases under the Interstate Commerce Act*, second edition. (MTWTh 10:00-11:00.) Mr. Rottschaefer.

Insurance. Nature and requisites of the contract; premiums and assessments; insurable interests; concealment; representations and warranties; waiver and estoppel; rights under the policy; beneficiaries, assignees, and creditors; construction of the policy. Vance, *Cases on Insurance*. (TWThF 11:00-12:00.) Mr. Fletcher.

International Law. See announcement by the Department of Political Science.

SECOND TERM

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 8:00-9:00.) Mr. McClintock.

Partnership. The nature and formation of the partnership relation; the rights and liabilities of the partners, both *inter se* and as to third parties. Gilmore, *Cases on Partnership*. (TWThF 9:00-10:00.) Mr. Paige.

Trade Regulation. Common and statute law relating to restraint of trade, methods of competition, public control over business, special reference to Sherman Anti-Trust Act and other federal and state anti-trust laws and functions of Federal Trade Commission. Oliphant, *Cases on Trade Regulations*. (MTWTh 10:00-11:00.) Mr. McClintock.

Damages. Exemplary damages; nominal damages; direct and consequential damages; elements of injury; function of court and jury; liquidated damages; entire and prospective damages; limitations of interest; aggravation and mitigation. Special applications. Beale, *Cases on Damages* (third edition). (TWThF 10:00-12:00.) Mr. Paige.

THE MEDICAL SCHOOL

GENERAL INFORMATION

THE SUMMER QUARTER—TERMS

The first term of the summer quarter will extend from June 18 (classes begin June 21) to July 31; the second, from August 2 to September 4. 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.

COURSES FOR MEDICAL STUDENTS

CLINICAL YEARS

The Medical School offers full courses 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 regulations 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 may take one of the programs listed below and 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 1926. These courses are as follows: Medicine 23su, 25su, 26su, 27su, 29asu, 34su, 42su. Obstetrics 23su, 24su, and 28su. Pediatrics 23su and 24su. Pharmacology 105su and 108su. Surgery 26su and 27su. Electives. See departmental statements for hours and credits.

Sixth Year (Senior Medical)

The program for the summer quarter will consist of the following courses. For descriptions and schedules see departmental statements.

Preventive Medicine and Public Health 101su, Medicine 30su, Obstetrics 22su and 25su, Pathology 109su, Pediatrics 29su, Hospital 79su (Roentgenology).

Clerkships and Dispensary, 30 hours a week. See departmental statements.

Under the curriculum senior students are assigned to a particular clerkship and to particular dispensary clinics each quarter. 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 previous paragraph and 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

Medical students electing the program of clinical subjects in the junior and senior medical years must, and others may, pay the regular quarterly tuition fee of the Medical School, namely, \$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.

Laboratory fees are not payable under this plan; but the following extra fees are charged: health fee, \$2; Minnesota Union or Shevlin Hall fee, \$1; deposit,¹ \$10.

Term fees are, in each case, half the quarterly fees.

¹ For students who pay the regular quarter fee in medicine a two-dollar recreation fee will be deducted from the general deposit fee.

Students who do not desire time credit on the medical course nor to register for one of the regular programs of clinical subjects may pay the regular summer session fee of \$25 per term. No extra fees except the laboratory fees of the courses selected and the deposit fee are chargeable under this plan. Such students will register in the Summer Session and not in the Medical School.

ELECTIVES

Various electives will be offered in the clinical departments. See departmental statements in this bulletin and also special summer quarter programs of the Medical School (to be published later) for details.

The electives offered in the laboratory departments are also described in the departmental statements in this bulletin.

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.

FEE\$ 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.

COURSE\$ 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 87.

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, VII, 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. (6 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.) Dr. 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 Dr. Scammon.
- 163su. Seminar in Human Growth. Permission by Dr. 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 Dr. 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. Siperstein and assistants.
- 111su. Anatomy of the Head and Neck. Human dissection. (First yr. dent. and others; prereq., Anat. 9-10; MTWThFS I, II, III, IV; 304,307IA.) 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. Dr. Rasmussen and assistant.
- 156su. Advanced Anatomy. (See under First Term, Course 156.) Permission by Dr. Rasmussen required. Credits and hours arranged.

204su. Research in Anatomy. (See under First Term, Course 204.) Permission by Dr. Scammon required. Credit and hours arranged.

BACTERIOLOGY

FIRST TERM

- 51su.¹ 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. Dr. Henrici.
- 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. Dr. Henrici.
- 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 disease; principles of infection and immunity. Fourth year medical students and others. (4 cred.; 4th yr. med. and others; prereq., general bacteriology; MTWThF VI, VII, VIII; 201,315MH.) 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.
- 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 Technique. Methods of preparation of microscopic and gross specimens. Limited to three students. (Hr. and cred. ar.; 112IA.) Laboratory fee, \$1 per credit. Staff.
- 107su. Advanced Pathology. Laboratory studies in the examination of routine operative and autopsy specimens. Limited to three students.

- (Hr. and cred. ar.; 110IA.) Laboratory fee, \$1 per credit. Dr. Bell, Dr. Clawson, Dr. McCartney.
- 108su. Diagnosis of Tumors. (3 cred.; 66 hrs.; prereq., Pathology 102; TTh 3:00-5:50; 108IA.) Laboratory fee, \$1.50. Dr. Bell, Dr. McCartney.
- 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.
- 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.; 44 hrs.; prereq., physiology; hrs. to be arranged. 322MH.) Mr. Gregory.
- 4su. Pharmacology. The history, origin, nature, pharmacal preparations, and use of drugs. (44 hrs. cred.; limited to 2d yr. dent.; prereq., physiology; TF 2:00-3:00 p.m.; W 2:00-4:00 p.m.; T 3:00-5:00 p.m.; 322MH.) Dr. Hirschfelder, Dr. Brown, Dr. Bieter.
- 102su. Experimental Pharmacology. Laboratory portion only. Exercises illustrating the preparation and action of medicines. Laboratory fee, \$3. (3 cred.; 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 (until Aug. 10 incl.); 214MH.) Dr. Hirschfelder, Dr. Brown, Dr. Bieter.
- 108su. Prescription Writing. The principles of prescription writing. (5th yr.; 11 hours; TThS III (after August 10); 214MH.) 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.; 322MH.) Dr. Hirschfelder, Dr. Brown.
- 203su. Research in Pharmacology. Open to graduate and advanced students. Hours and credits arranged. Dr. Hirschfelder, 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; 301,315MH.) Laboratory fee, \$1.50. Dr. King and assistant.

¹ Students who find it more convenient, may arrange to do part of their laboratory work in the afternoon.

- 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., MWF II, III; lab.,¹ T I, II, III; Th I, II, V; TTh or ar. VI, VII, VIII; 315MH.) Laboratory fee, \$3. Dr. King and assistant.
- 100su. Physiologic Chemistry. Metabolism of carbohydrates, fats, and proteins in health and disease. (6 cred.; prereq., organic chemistry and physics; lect., MTWThF I; 214MH.; 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 and assistant.
- 103su. Physiology of Muscle, Nerve, Blood, Circulation, Respiration, Digestion. (9 cred.; 4th yr. med. and others; prereq., organic chemistry and animal biology; lect., MTWThFS I; rec., MWF II; lab., MWF III, IV; TS II, III, IV; Th II, 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.
- 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. (6 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. Dr. McClendon 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; 310MH.) 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. Dr. McClendon.
- 203su. Research. Continued as in first term. Dr. Greisheimer.
- 205su. Research in Physiologic Chemistry. Same as 205su, first term, given above. Dr. McClendon.

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 diseases and of physical defects and presents the fundamental principles and working methods of health conservation and disease prevention. Lectures, demonstrations, discussions, inspection trips, and directed readings. (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; protection of food, water, and milk. Vital statistics, school health work. (3 cred.; jr., sr.; prereq., Bacteriology I, 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.
- 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. 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.
- 102su. Sanitation. Sanitary supervision of water and milk supplies, sewage, refuse, and garbage disposal systems. Practical work, including field investigations, laboratory examinations, interpretation of results, recommendations to correct unsatisfactory conditions, report writing and office procedure. (Credit and hours arranged; grad.; prereq., Bacteriology 101, Chemistry 21 or 27, and 32 or 37, Physics 22, 32, 42; ar.; SBH.) Mr. Whittaker, Dr. Archibald, Mr. Childs.
- 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. Systematic lectures, exclusive of neurology and dermatology. (33 hrs.; 5th yr.; TThS 9:00-9:50; 129MH.) Dr. Fahr, Dr. Gardner, Dr. McKinlay, Dr. Cook.
- 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. C. B. Wright, Dr. Wetherby, and others.
- 26su. Clinical Chemistry and Microscopy. Methods of laboratory examination for diagnostic purposes. (83 hrs.; 5th yr.; prereq., pathology and physiologic chemistry; MWF 3:00-5:30; 129, 301MH.) Dr. O'Brien.
- 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. C. B. Wright, Dr. Wetherby, and staff.
- 29asu. Medical Clinic on Dispensary Cases. (22 hrs.; 5th yr.; Secs. b and c, M; Secs. a and c, WF 2:00-2:50; Secs. a and b, F; 129MH.) Dr. Fahr and others.
- 30su. Clinic in Medicine. Sixth year, Divisions A, B, D. (22 hrs.; TTh 8:00-8:50; UH.) Dr. Berglund, Dr. Myers, 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. Myers, and others.
- 33xsu. Clinical Clerkship. Same as 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.

¹ Permission of instructor.

- 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.

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. (41 hrs. cred.; see special schedule, sections of sr. class; daily 1:00-3:00.) Dr. Butler, Dr. Michelson, and others.

Elective Courses

- 91su. Night Clinic in Dermatology and Syphilis. Limited to 46 students in clerkship division. (33 hrs.; MTh 7:00-8:30; UD.) Dr. Turnacliiff.
- 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. Solhaug.
- 23-24su. Gynecology. A study of diseases of women. (33 hrs.; jr.; TThS 8:00-8:50; 104IA.) Dr. Barry.
- 25su. Obstetrics and Gynecology. Lectures, class clinics, and case analysis of the pathology of obstetrics and gynecology. (22 hrs.; sr.; MW 8:00-8:50; 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 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. Dornblaser, Dr. Proshek.

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, Dr. Bicek.
- 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. Limited to one student at each station. (11 hrs.; Wells Memorial, M 9:15, Dr. Simons; 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

- 20su. Ophthalmology. Lectures and demonstrations. (18 hrs.; srs.; FS 8:00-8:50; 129MH.) Dr. Burch.
- 23su. Clinic in Diseases of the Eye. Methods of examination, diagnosis, and treatment. (25 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. (25 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. (25 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

- 115su. Clinic in Diseases of the Eye. Examination, diagnosis, and treatment. (99 hrs. cred. or ar.; srs.; MTWThFS 1:00-3:00; UD.) Dr. Clark, Dr. Macnie, and associates.
- 117su. Clinic in Diseases of the Ear. Examination, diagnosis, and treatment. (99 hrs. cred. or ar.; srs.; MTWThFS 1:00-3:00; UD.) Dr. Newhart, Dr. Camp, and associates.
- 119su. Clinic in Diseases of the Nose and Throat. Examination, diagnosis, and treatment. (99 hrs. cred. or ar.; srs.; MTWThFS 1:00-3:00; UD.) Dr. F. J. Pratt, Dr. J. A. Pratt, and associates.
- 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 2:30-3:30; 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.
- 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 9:15-12:00; 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 3:30-5:00; UH amphitheater.) Dr. Schlutz and others.

Elective Courses

FIRST TERM

- 55fsu. 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 Rescue Home, 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. (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 10:30-11:30; South Town Children's Clinic.) Dr. Moriarty.
- 55csu. Same as above. (Th.)
- 55dsu. Infant Feeding Clinic. Two students only. (11 hrs.; 5th and 6th yrs.; M 10:30-11:30; Pillsbury Settlement House.) Dr. Platou.

- 55esu. 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 Hospital.) By arrangement students may take this course only one or two days a week with corresponding credit. Dr. Christison and others.
- 101su. Intubation. Two to four students. (Cred. and hrs. ar.) Dr. Platou.
- 102su. Class Clinic in Pediatrics. Same as Ped. 29. (17 hrs.; 5th and 6th yrs.; Th. 3:30-5:00; UH amphitheater.) Dr. Schlutz.
- 200su. Advanced Study in Diseases of Infants and Children. (Cred. and hrs. ar.) Dr. Schlutz.
- 206su. Research in Pediatrics. (Ar.; 121MH.) Dr. Schlutz.

SURGERY

FIRST AND SECOND TERMS

Required Courses

- 26su. Diagnostic Clinic. Class clinics on the diagnosis of surgical conditions presented in the Out-Patient Department. (11 hrs.; jr. class; T 11:00-11:50; 129MH.) Dr. Johnson.
- 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. Wagensteen.
- 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 hours; sr.; daily 10:30-12:00; see special schedule; Disp., MH.) Dr. McKinney, Dr. Bratrud, Dr. Hayes.
- 41su. Orthopedic Clinic. In the Out-Patient Department; a part of required section clinics. (18 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. (30 hrs.; sr.; daily 1:00-2:30; see special schedule; Disp., MH.) Dr. Thomas, Dr. Kremer, Dr. Wethall.

Elective Courses

- 51su. Minor Surgery. Clinical course conducted in the Out-Patient Department. (Daily 10:30-12:00; ar. days and cred.) Dr. McKinney, Dr. Bratrud, Dr. Hayes.
- 53su. Animal Surgery. Specially prepared students may arrange for work in the Surgery Laboratory. Arrange days and hours with Dr. Zierold.

- 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.; M 10:30-12:00; Minneapolis Gen. Hosp.) Dr. Zierold, Dr. Regnier, Dr. Robitshek.
- 56bsu. Same as 56asu. (W 10:30-12:00.)
- 56csu. Same as 56asu. (F 10:30-12:00.)
- 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.

HOSPITAL

DIVISION OF ROENTGENOLOGY FIRST AND SECOND TERMS

- 79su. Roentgenology. Lectures. Sixth year medical students. (11 hrs.; W 4:00-4:50; 214MH.) Dr. Allison.
80. Plate-Reading. Arrange hours and credit.
81. X-Ray Technique. Arrange hours and credit.
82. X-Ray Therapy. Arrange hours and credit.

COLLEGE OF DENTISTRY

Courses in contributing departments are announced elsewhere in this bulletin. See particularly Anatomy, Bacteriology and Immunology, Chemistry, Pathology, Pharmacology, Physiology, and Metallography.

Fees: full time, \$40; half time, \$20, for each term.

In addition each student pays the following:

Minnesota Union or Shevlin Hall fee.....	\$0.50
Health fee	1.00
General deposit*	5.00

Courses 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. Leonard, and associates.

Technique courses will be offered in those departments in which a sufficient number of students petition for the work.

* For students who pay regular term fees in dentistry \$1 will be deducted from the general deposit fee to cover recreation.

THE SCHOOL OF CHEMISTRY

GENERAL 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. Reyerson.
- 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. Stephens.
- 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. Reyerson.
- 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. Stephens.
- 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.
- 17su.¹ Glass Blowing. Exercises in the more important operations in building chemical apparatus. (1 cred.; jr., sr., grad.; no prereq.; MWF VIII-IX.) Mr. Stephens.
- 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.
- (See also Courses 126su and 226su under the head of Analytical Chemistry.)

¹ A laboratory fee of \$1.50 is charged for this course.

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. Heisig.
- 5su.¹ General Inorganic Chemistry. A continuation of 4su. (4 cred.; prereq., 4; lect., MTWThFS II; 225C; lab., MTWTh VI-VII; 210C.) Mr. Maynard.
- 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. Heisig.
- 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. Maynard.

ANALYTICAL CHEMISTRY

FIRST TERM

- 20su.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; 215C; lab., MThF V-VIII; TW VII-VIII; 310C.) Mr. Geiger.
- 27su.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; 315C; lab., MThF V-VIII; TW VII-VIII; 310C.) Mr. Geiger.
- 126su.¹ Chemistry of the Rare Elements. The general and analytical chemistry of those elements not considered in ordinary courses. Laboratory work may consist either of analyses of commercially important ores, or of the preparation and study of scientifically interesting compounds. Four lectures and twelve hours of laboratory per week. (2 to 4 cred.; sr., grad.; prereq., 20, 21, or equiv.; hrs. to be ar.) Mr. Brinton.
- 226su. Selected Topics in Analytical or Inorganic Chemistry. Analytical or general problems of an advanced nature presenting special difficulties will be selected for study and investigation in the laboratory, in the library, and by conference. (2 to 4 cred.; open only to grad. students who have a good foundation in inorganic and analytical chem.; hrs. to be ar.) Mr. Brinton.
- 324su. Research in Analytical Chemistry. (Cred. and hrs. to be ar.) Mr. Brinton, Mr. Geiger.

¹ A laboratory fee of \$1.50 is charged for this course.

ORGANIC CHEMISTRY

FIRST TERM

- 31su.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 35 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. Smith.
- 133su. 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 laboratory work in Chemistry 138. (3 cred.; prereq., 37; MTWThF IV; 115C.) Mr. Smith.
- 138su.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., 37; hrs. to be ar.) Mr. Smith.
- 334su. Research in Organic Chemistry. (4 or 5 cred.; hrs. to be ar.) Mr. Smith.

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. Lauer.

PHYSICAL CHEMISTRY

FIRST TERM

- 140-141su.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., 2 yrs. col. chem., 1 yr. col. phys.; lect., MTWThFS II; 115C; rec., MWF III; 115C; lab., MT VI-IX, or MTWTh VI-IX; 117C.) Mr. MacDougall.
- 153su.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.
- 344su. Research in Physical Chemistry. (Cred. and hrs. to be ar.) Mr. MacDougall, Mr. Reyerson.

¹ A laboratory fee of \$1.50 is charged for this course.

² This course is equivalent to Courses 140f and one half of 141w, which are offered during the academic year.

TECHNOLOGICAL CHEMISTRY

FIRST TERM

- 167su.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.
- 168su.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.
- 169su.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.
- 364su. Research in Technological Chemistry. (Cred. and hrs. to be ar.) Mr. Harding.

CHEMICAL ENGINEERING

FIRST TERM

- 171su. 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.
- 174su.¹ Chemical Manufacture. (Inorganic.) 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 175su. (3 cred.; prereq., 171; MTWThF I-IX; S I-IV; 90C.) Mr. Mann.
- 175su.¹ Chemical Manufacture. (Organic.) Similar to Course 174, 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 174su. (3 cred.; prereq., 171; MTWThF I-IX; S I-IV; 90C.) Mr. Montillon.
- 178su. Unit Process Problems. Combustion, gas absorption, drying, distillation, heat transfer and evaporation, fluid flow and filtration, and the general chemical processes. (3 cred.; prereq., 173; hrs. to be ar.) Mr. Montillon.
- 374su. Research in Chemical Engineering. (Cred. and hrs. to be ar.) Mr. Mann, Mr. Montillon.

¹ A 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.

GENERAL COURSES

208su. 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 graduate degrees. (2½ cred.; MTWFS III; 210OL.) Mr. Olson.

AGRICULTURAL EDUCATION

FIRST AND SECOND TERMS

- 81su. Extension Work. Federal, state, and local extension aims, organization. Assembling and use of extension data and equipment. Development of extension methods especially as applied to the work of Minnesota. (3 cred.; prereq., 6 cred. in farm mgt., 6 cred. in farm crops, 15 cred. in an. ind., 6 cred. in agr. ed.; MTWThFS II; 202 Ad(F).) Mr. Storm, Mr. Peck.
- 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.
- 224su. Graduate Problems. Making investigations, gathering data, and formulating plans regarding agricultural education. (Ar.; ar.) Mr. Storm.

¹ Broad curriculum approved by the Agricultural Education Division and a position approved by the Agricultural Extension Division are also prerequisites to this course.

ART EDUCATION

FIRST TERM

FINE ARTS

- 1su. Fundamental Principles of Design. Elementary problems involving the study and application of the principles of proportion, space breaking, contour and surface enrichment, with emphasis on the relation of design to industrial products. Recommended for manual arts teachers and others not majoring in Arts Education. (1 cred.; no prereq.; lect., MWF I; lab., MWF II; 404F.) Mr. Hilpert.
- 7,8,9su. Sketch. From the posed figure in charcoal and pencil, with emphasis on action, form, and value relations. (1 cred. each; no prereq.; Sec. 1, lect., TThS I; Sec. 2, lect., TThS II; lab., TThS III; 402F.) Mr. Hilpert.
- 23 or 26su. Water Color, or Pencil and Pen Techniques. Drawing from objects and outdoor sketching in these mediums. Emphasis on form, color, and technical handling. (1 cred. each; prereq., 4, 5, 6, or equiv., or ar. with instructor; Sec. 1, MWF III; Sec. 2, MWF IV; 404F.) Mr. Hilpert.
- 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. Lectures with assigned laboratory work. (1 cred.; no prereq., TThS IV; 404F.) Mr. Hilpert.
- 86,87,88su. Practice Teaching in Art. (1 cred.; prereq., 9 cred. in design, 9 cred. in drawing, 6 cred. in handicrafts; ar.) Mr. Hilpert.

CRAFTS

(Courses 36su to 41su require departmental approval of registration.)

- 36su. Cardboard and Paper Construction. Boxes, toys, furniture, and other public school problems. (1 cred.; no prereq.; limited to 20 students; lect., MWF VI; lab., MWF VII, VIII; 404F.) Miss Sutorius.
- 37su. Elementary Basketry. Reed and raffia, splint, pine needles, and caning. (1 cred.; no prereq.; limited to 15 students to each section; TTh VI, VII, (VIII); Sec. 1, lect. VI; Sec. 2, VII; 404F.) Miss Sutorius.
- 38su. Allied Crafts. Elementary weaving, hand looms, colonial rugs and mats, bead work, chains, knot work, ropes, bags, and hammocks. (1 cred.; no prereq.; limited to 15 students to each section; MW VI, VII, VIII; Sec. 1, lect., MW VII; Sec. 2, lect., MW VIII; 401F.) Miss Sutorius.
- 39su. Advanced Reed Work. Principles of simple furniture, including fire-side baskets, floor lamps, tables, bookcases, and chairs, and the more advanced basket weaves. (2 cred.; prereq., 37 or equiv.; limited to 10 students; MW VI, VII, VIII; lect., MW VI, VII; 406F.) Miss Ross.
- 40su. Advanced Weaving. Table and foot power looms. Sequence of problems from the simple hand loom to the threading and use of the four harness foot power loom. (2 cred.; prereq., 38 or equiv.; limited to

10 students; TTh VI, VII, VIII; lect., TTh VI, VII; 401F.) Miss Ross.

- 41su. Elementary Pottery. Simple problems in clay, cement, and clay substitutes. Students will be given the opportunity to make and apply simple glazes and to observe the packing and firing of the kiln. (2 cred.; no prereq.; limited to 15 students; MWF VI, VII, VIII; lect., MW VIII; lab., F VII, VIII; F.) Miss Ross.

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; 204Ed.) Mr. Boardman.
- 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, Mr. Kefauver.
- 115su. 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; MTThF VI; 222OL.) Mr. Brueckner.
- 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 II; 210OL.) Mr. Peik.
- 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; 215Ed.) Mr. Steel.
- 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; MTThF IV; 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. (3 cred.; sr., grad.; prereq., Ed. 124-125; MTWThFS I; 215Ed.) Mr. Farley.
- 128su. 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. (1 cred.; prereq., Ed. 124-125-126; ar. V; 222OL.) Mr. Engelhardt.

- 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 VII; 204Ed.) Mr. Brueckner.
- 161asu¹ 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; 215Ed.) Mr. Steel.
- 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.
- 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. (2 cred.; sr., grad.; prereq., Ed. 1, 3; TWThF VII; 210OL.) Mr. Koos, Mr. Kefauver.
- 175su. City School Finance. Analysis of unit costs on various bases; comparative cost accounting systems, budgets, financial records, and reports. (3 cred.; sr., grad.; prereq., Ed. 124-125; MTWThFS II; 113Ed.) Mr. von Borgerode.
- 205su. Seminar in Educational Administration. (2 cred.; grad.; prereq., Ed. 124-125-126, 160-161-162; MTWF VI; 206OL.) Mr. Engelhardt.
- 220su. Seminar in Secondary School Problems. (2 cred.; grad.; prereq., consent of instructor; TWThF VI; 210OL.) Mr. Koos.
- 225su. Seminar in Elementary School Problems. (2 cred.; grad.; prereq., consent of instructor; MTWF VIII; 222OL.) Mr. Brueckner.

SECOND TERM

- 113su. High School Curriculum. For course description see first term. (3 cred.; jr., sr., grad.; prereq., 1, 3; MTWThFS IV; 215Ed.) Mr. Boardman.
- 119su. Elementary School Curriculum. For course description see first term. (3 cred.; sr., grad.; prereq., 1, 3; MTWThFS V; 204Ed.) Mr. Peik.
- 124su. Educational Administration. For course description see first term. (3 cred.; sr., grad.; prereq., 10 hrs. in education; MTWThFS I; 210OL.) Mr. Engelhardt.
- 125su. Educational Administration. For course description see first term. (3 cred.; sr., grad.; prereq., 55, 116, 124; MTWThFS II; 222OL.) Mr. Engelhardt.
- 162asu. 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

¹ A laboratory fee of \$1.50 is charged for this course.

- work; some consideration of spelling and writing. (2½ cred.; jr., sr., grad.; prereq., 15, 111, 160; MTWFS III; 204Ed.) Mr. Peik.
- 164su. Problems of High School Administration. A study of elimination from school, secondary vocational education, the marking system classification of students, high school library, social organizations and extra-curricular activities, community relationships, teaching schedule, building, costs. (3 cred.; sr., grad.; prereq., 10 hrs. in education; MTWThFS V; 215Ed.) Mr. Boardman.
- 174su. Public School Finance. A critical study of problems of federal and state aid to public schools; sources, methods, principles, needed reforms. (2½ cred.; sr., grad.; prereq., 124, 125; MTWFS III; 222OL.) Mr. von Borgersrode.

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.
- 57su. Ontogenetic Psychology. Mental, physical, social, and emotional development in children. With emphasis on the psychology of the pre-school child. (3 cred.; jr., sr.; prereq., 6 cred. in psy.; MTWThFS II; 206Ed.) Mr. Olson.
- 107su. Advanced Educational Psychology. Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; study of typical learning experiments. Study of group and individual differences, and their relations to educational practice. (3 cred.; jr., sr., grad.; prereq., 55 or equiv.; MTWThFS V; 301Psy.) Mr. Miller.
- 111su.¹ Educational Diagnosis. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the tests. (2½ cred.; jr., sr.; prereq., 55 or equiv.; MTWFS III; Psy. Lab.) Mr. Turney.
- 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., 55; MTWThFS I; 210OL.) Mr. von Borgersrode.
- 134su.¹ Mental Tests. Study of mental variation in children, its nature, degree, 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. Bohan.

¹ A laboratory fee of \$1.50 is charged for this course.

² A laboratory fee of \$1.00 is charged for this course.

- 138su.¹ Experimental Educational Psychology. A laboratory course designed to train students in the use of experimental methods in the study of educational problems, particularly in the field of the psychology of learning. It is suggested that this course supplement either 191 or 106-107-108. (3 cred.; jr., sr., grad.; prereq., 55 or equiv.; MTWThF VIII, IX, 2 additional hours weekly arranged; 301Psy.) Mr. Rockwell.
- *143su.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 and 111 or 134, consent of instructor; MTWThF VIII-IX, 2 additional hours weekly arranged; 109Psy.) Mr. Turney.
- 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 scientific interpretation of data. (3 cred.; sr., grad.; prereq., Ed. 134-135-136, consent of instructor; ar. VI-VII; 301Psy.) Mr. Rockwell, Mr. Turney.
- 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.
- 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; 205Ed.) Mr. Blanton.

SECOND TERM

- 55su. Educational Psychology. For course description, see first term. (3 cred.; jr., sr.; prereq., 6 cred. in psy.; MTWThFS I; 115Psy.) Mr. Olson.
- 108su. Advanced Educational Psychology. A study of recent literature in educational psychology. (3 cred.; jr., sr., grad.; prereq., Ed. 55 or equiv.; MTWThFS I; 109Psy.) Mr. Miller.
- 111su.¹ Educational Diagnosis. For course description, see first term. (3 cred.; jr., sr., prereq., Ed. 55 or equiv.; MTWThFS II; 301Psy.) Mr. Olson.
- 116su.² Elementary Educational Statistics. For course description, see first term. (3 cred.; sr., grad.; prereq., Ed. 55; MTWThFS II; 210OL.) Mr. von Borgerode.
- 134su.¹ Mental Tests. For course description, see first term. (2 cred.; jr., sr., grad.; prereq., 55 or equiv.; MTWF II, III; 115Psy.) Mr. Miller.
- *144su.¹ Individual Mental Examination. For course description, see first term, Course 143. (3 cred.; jr., sr., grad.; prereq., Ed. 55 or equivalent; ar.; 301Psy.) Mr. Rockwell.

* 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.

- 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 IV; 204Ed.) Mr. Streightoff.
- 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 I; 205Ed.) Miss Alexander.
- 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 V; 205Ed.) Miss Alexander.

SECOND TERM

- 3su. Educational Sociology. For course description, see first term. (3 cred.; jr., sr.; prereq., 6 cred. in psy.; MTWThFS IV; 210OL.) Mr. Finney.
- 102su. History of Modern Secondary and Higher Education. A survey of existing types of American and European secondary and higher schools, followed by a historical study of their origin, aims, growth. (MTWThFS I; 215Ed.) Miss Alexander.
- 103su. History of Modern Elementary Education. For course description, see first term. (3 cred.; jr., sr., grad.; prereq., 6 cred. in psy. and 6 cred. in hist.; MTWThFS II; 215Ed.) Miss Alexander.
- 187su. Seminar in Educational Sociology. The sociological foundations of educational theory will be discussed, with the investigation of specific problems. (3 cred.; sr., grad.; prereq., Ed. 1 or 101-102-103, and 3; MTWThFS V; 222OL.) Mr. Finney.

HOME ECONOMICS EDUCATION

FIRST TERM

- 42su.¹ Special Methods of Teaching Home Economics. Curricula, equipment, methods of teaching for home economics. Actual class work illustrating principles of teaching. (5 cred.; jr., sr.; prereq., 13, 22, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55; MTWThF VII, VIII; HE.) Miss Rose.

¹ Prerequisites waived for teachers of home economics.

- 141su.¹ Problems in Home Economics Education. Problems of administration and supervision of home economics, study of curricula for the day, part time, and evening schools, consideration of the home project and related work. (2 cred.; sr.; prereq., 42; MTWThF V; HE.) Miss Brown.
- 142su. Educational Measurement in Home Economics. Survey of accomplishment in this field; evaluation and construction of lists. (2 cred.; sr.; prereq., 42, Ed. Psy. 55; MTWF III; HE.) Miss Brown.
- 205su. Seminar in Home Economics. (2 cred.; sr., grad.; prereq., consult instructor; ar.; ar.) 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 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; 3Mu.) Mr. Pepinsky.
- 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; —Mu.) Mr. Pepinsky.
- 75su. Public School Music for the Grades. Grade methods in music. (3 cred.; jr., sr.; no prereq.; MWF I-II; —Mu.) Mrs. Findley.
- 78su. Public School Music for High Schools. High school methods. (3 cred.; jr., sr.; prereq., 75; MWF III-IV; —Mu.) Mr. Griebenow.
- 94su. Ensemble. Chamber music, duos, trios, and quartets and other larger combinations for strings and wind instruments. For students of piano, violin, organ, etc. (2 cred.; jr., sr.; prereq., consult instructor; —Mu.) Mr. Pepinsky.

SPECIAL EDUCATION

LIBRARY TRAINING

FIRST TERM

- 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; 117Ed.) 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; 117Ed.) Miss Penrose.

For additional courses in library training see special circular.

¹ Prerequisites waived for teachers of home economics.

² The three subjects may be taken concurrently.

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 lisping and the oral inactivities; discussion of delayed speech and its treatment. (2½ cred.; MTWFS III; 205Ed.) Dr. 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.) Dr. 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, posture work, corrective gymnastics, corrective phonetics, and emotional re-education. (1½ cred.; MTWThF VI-VII; John Marshall High School.) Dr. Blanton, Miss Green, Mrs. Whelan.
- 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.) Dr. Blanton, Miss Green, Mrs. Whelan.
- 192su. Behavior Problems in Children. For course description see under Educational Psychology. (3 cred.; prereq., Ed. Psy. 55 or equiv.; MTWThFS IV; 205Ed.) Dr. 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 VI; 113Ed.) Mr. Haertter.
- 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. (2½ cred.; prereq., Ed. 55; MTWFS III; 204Ed.) Mr. Willing.
- 16su. Practice Teaching. Teaching under supervision in the Minneapolis city schools, in regular secondary school subjects. (5 cred.; sr., grad.; prereq., Ed. 15 and Special Methods Course; ar.) Mr. Boardman, Miss Smith.
- 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.

¹ A laboratory fee of \$1.50 is charged for this course.

² A laboratory fee of \$1.00 is charged for this course.

- 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., soc., either American History or Modern European History, and Ed. 15; MTWF VII; 204Ed.) Mr. Tohill.
- 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 instructor; MWF VIII, IX; 8Ed.) Mr. Smith.
- 42su. Fundamental Educational Theories Related to Instruction in the Elementary School. A study of current educational concepts as related to problems in the elementary school. Not open to those who have had Ed. 160. (3 cred.; jr., sr.; MTWThFS IV; 202Ed.) Miss Kilgore.
- 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 V; 206Ed.) Miss Cutright.
- 44su. Children's Literature. Acquaintance with graduation and adaptation of literature to children's interests in the school room and at home; bases of selection, materials for expressive and extensive reading; examination and evaluation of materials. (3 cred.; jr., sr.; no prereq.; MTWThFS V; 202Ed.) Miss Kilgore.
- 51asu. The Teaching of Composition in the Junior High School. Importance of classroom presentation in realizing the aims of composition teaching; project motivation; group method; place of grammar, punctuation, and spelling. (2 cred.; jr., sr.; prereq., Ed. 15; TWThF VIII; 206Ed.) Miss Smith.
- 51bsu. The Teaching of Literature in the Junior High School. Differentiated purposes in reading and literature; methods of classroom presentation; group and project method in extensive reading; illustrative material; testing. (2 cred.; jr., sr.; prereq., Ed. 15; TWThF IX; 206Ed.) Miss Smith.
- 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; 113Ed.) Mr. Haertter.
- 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; 215Ed.) Mr. Tohill.
- 73su. Teachers' Course in Latin. Class drills and discussion of various problems connected with secondary school work in Latin. (3 cred.; jr., sr.; prereq., any two of courses 51-53 or equiv., 75 and Ed. 15; MTWThF VI; W VII; 202Ed.) Miss Denneen.

- 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; 206Ed.) Miss Cutright.
- 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; 206Ed.) Mr. Willing.

SECOND TERM

- 195su.¹ Technique of High School Instruction. For course description, see first term. (3 cred.; prereq., 55; MTWThFS V; 210OL.) Mr. Hudelson.

TRADE AND INDUSTRIAL EDUCATION

FIRST TERM

- Ind.115su.² Teachers' Course in Special Class Wood Work. This course is designed for primary grade teachers, teachers of subnormal children, and teachers of art. Lectures and shop work. The manipulative experience is divided into three parts: flat piece work, assembled and movable parts, and toy furniture. (2 cred.; no prereq.; MTWF I, II; 24Ed.) Mr. Sturtevant.
- Ind.145su. Methods of Teaching Mechanical Drawing. The selection and arrangement of course materials, methods of presentation, teaching plans and devices, evaluation of texts, problems of the drawing room, testing, grading, and records. Not a course in drawing. (2 cred.; jr., sr.; MTWF III; 115Ed.) Mr. Sturtevant.
- Ind.205su. Industrial History. Lectures, quizzes, and required readings. Evolution of arts, industry, tools, processes, and production to 1800; evolution in 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. (2 cred.; no prereq.; MTWF III; 111Ed.) Mr. Tohill.
- Ind.305su. Graphic Presentation. Study of typical methods of graphic representation of data. The use of educational and social materials for drill in the interpretation and statement of facts and conditions. (2 cred.; all; no prereq.; TWThF II; 222OL.) Mr. Smith.
- Ind.66su. Methods in Related Subjects. Theory, practice, and problems of related instruction; content in applied mathematics, drawing, science, and safety; group study and unit course preparation; usable methods and the means of supervision. Both incidental and scheduled teaching discussed. (2 cred.; jr., sr.; prereq., 40; TWThF I; 222OL.) Mr. Smith.
- Ind.70su. Methods in Shop Subjects. Various methods of conducting shop classes, with and without reference to production work; lesson plans, grading, reports, and records; shop management and the assigning of jobs; standards of workmanship. (2 cred.; prereq., 40; TWThF II; 111Ed.) Mr. Craigo.

¹ A laboratory fee of \$1.00 is charged for this course.

² A laboratory fee of \$1.50 is charged for this course.

- Ind.80su. Organization and Supervision of General Industrial Training. Organization and supervision of the industrial offering for grades and high schools in typical Minnesota towns. Aims, teaching fitness, schedules, course outlines, equipment, methods, and management. Report of a first hand study of sixty-five Minnesota industrial departments. (2 cred.; jr., sr.; no prereq.; TWThF IV; 222OL.) Mr. Smith.
- Ind.172su. 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; qualification of instructors, problems and difficulties, records and certification, fees and charges. Buildings, equipment, and instruction facilities. General versus unit course organization. Costs. (2 cred.; jr., sr., grad.; no prereq.; TWThF IV; 111Ed.) Mr. Bass.

Content courses of wide variety in shopwork 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, pattern making, machine shop practice, forging and foundry work. The shops will be open both morning and afternoon on Mondays but mornings only during the remainder of the week, including Saturday mornings. It is the desire to keep schedules flexible, and instructors should be consulted in cases of program conflict so that special arrangements may be made. Mr. Sturtevant's course, listed above as Ind. 11, will enroll women only; all men desiring woodwork of any kind will enroll in mechanical engineering with Mr. Richards.

Certain other courses will be available at Dunwoody Industrial Institute under co-operative agreement. The instruction will be confined to one eight-hour day each week (Mondays only), which arrangement will permit enrollment for 2 credits or 48 hours in a selected subject. Shop subjects available at Dunwoody will lie within the fields of auto mechanics, building construction, electricity, printing, and sheet metal.

A mimeograph copy of the four-year curriculum in Trade and Industrial Education for the bachelor of science degree will be sent, upon request, by the Department of Trade and Industrial Education, 218 Old Library Building. This copy should serve as a guide to the selection of required and elective courses offered in other departments of the University. (15 credits in shopwork and 10 credits of drawing are required, which total of 25 credits may be raised by election to a maximum of 45 credits total.)

SECOND TERM

No lecture courses in Trade and Industrial Education have been planned. Teachers enrolling will find opportunity to take shopwork and drawing as well as most of the required courses of the curriculum which lie outside the special field. Those desiring advice about second term programs should apply at room 218 Old Library after July 15.

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 at all times except on Sundays. A fee of one dollar per term is charged for use of the tennis courts.

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. Keller.
- 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.
13. Elementary Swimming. Individual instruction for those who cannot swim. (No cred.; no prereq.; all; MTWThF IV; A.) Mr. Thorpe.
14. Intermediate Swimming. Individual instruction given. (No cred.; no prereq.; all; MTWThF VII; A.) Mr. Thorpe.
15. Advanced Swimming. For teachers and coaches. Instruction in form and speed swimming, diving, plunging, water sports, life saving. (1 cred.; no prereq.; soph., jr., sr.; MTWThF VIII; A.) Mr. Thorpe.
17. School 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.
23. Technique of Gymnastic Teaching. Lectures and quizzes on terminology and methods of teaching. (1 cred.; no prereq.; jr., sr.; MTh VI; A.) Mr. Keller.
26. 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; TWF VI.) Dr. Cooke.
30. Athletic Training and First Aid. Principles governing conditioning of men for various sports; diet, sleep, exercise, bathing, massage. Overtraining; its cause, diagnosis, prevention, and cure. Prevention, first aid treatment, and care of common injuries of the athletic field and gymnasium. (1 cred.; no prereq.; jr., sr.; MWF I; A.) Dr. Cooke.
35. 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.; TS III; A.) Mr. Finger.
37. 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 the mechanics of football fundamentals. (3 cred.; no prereq.; sr.; MWF II, III; A.) Dr. Spears, Mr. Finger.
38. 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.; TThS I, II; A.) Dr. Cooke.
39. 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.
42. 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.

See also Courses 1su, 2su, 9su, 10su in the Department of Physical Education for Women.

SECOND TERM

- A. General Exercise. See Course A above. (No cred.; all; MTWThF IX; A.) Mr. Taylor.
- B. General Swimming. No instruction. No registration required. No cred.; no prereq.; all; MTWThF, Sec. 1, IX; Sec. 2, X; A.) Mr. Thorpe.
13. Elementary Swimming. See Course 13 above. (No cred.; no prereq.; all; MTWThF VIII; A.) Mr. Thorpe.
14. Intermediate Swimming. See Course 14 above. (No cred.; no prereq.; all MWThF VII; A.) Mr. Thorpe.
17. School Gymnastics. See Course 17 above. (1 cred; no prereq.; jr., sr.; MTWThF VI; A.) Mr. Taylor.
23. Technique of Gymnastic Teaching. See Course 23 above. (1 cred.; no prereq.; jr., sr.; TTh IV; A.) Mr. Taylor.
38. Basket-Ball. See Course 38 above. (2 cred.; no prereq.; sr.; MTWF VII, VIII (4 weeks' course); A.) Mr. Taylor.

DEPARTMENT OF PHYSICAL EDUCATION FOR WOMEN

Courses 1, 2, 9, 10 are open also to men.

The tennis courts will be available to students at all times on initial payment of a fee of \$1. See also Courses 6 and 7.

For hours when the swimming pool will be open for incidental use see Course 30.

The playground at Van Cleve Park, 15th Ave. S.E. and Como Ave., will be used for demonstration and practice purposes in connection with Course 2.

Home Economics 19su, Nutritional Aspects of Health, will be offered in the Women's Gymnasium MTWTh VI.

Except for courses in which shower bath fees are charged, students may procure shower bath tickets from the matron at fifteen cents apiece or at the rate of ten for one dollar.

Certain courses carry credit toward the teacher's certificate in physical education. See Courses 2, 3, and 4.

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 who are not, accustomed to some other method. The practical part of the course will include some of the recent innovations in gymnastics. (2 cred.; no prereq.; MTWFS I-II; 201, 153WGm.) Miss Baker.
- 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; 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. (3 cred.; no prereq.; MTWFS I-II; 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 Baker.
- 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., MW III; lab., MW IV; 151WGm.) Miss Campbell.
- 5su. Technique and Teaching of Baseball, Volley Ball, and Soccer. Lectures on rules, technique of play, and methods of teaching. Practice in fundamentals of the games. (1 cred.; no prereq.; lect., TS IV; lab., ThF IV; 201, 151WGm.) Miss Campbell.
- 6su. Tennis for Beginners. Class instruction in rules and fundamental technique. Fee, \$1. (No cred.; no prereq.; Sec. 1, TThS I; Sec. 2, MWF VIII; 151WGm.) Miss Shepard.
- 7su. Tennis, Intermediate. Class and individual instruction based on knowledge of rules and fundamental technique. Fee, \$1. (No cred.; no prereq.; Sec. 1, TThS II; Sec. 2, MWF VII; 151WGm.) Miss Shepard.
- 8su. Golf for Beginners. Two short courses of six lessons in groups limited to six. Each section will be assigned to a period of two weeks. (No cred.; no prereq.; MWF I, II.) 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.; TF II; 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.; TF III; 201WGm.) Miss Hosmer.
- 30su. General Swimming. No registration necessary. (No cred.; no prereq.; MWF 12:00 to 12:30; 51WGm.) Miss Campbell, Mrs. Foote.
- 31su. Elementary Swimming, Intensive Course. Class instruction given. Shower bath fee, \$1. Sections limited to 25. (No cred.; prereq., phys. exam.; Sec. 1, MTh IV; Sec. 2, TF IV; Sec. 3, WS IV; 51WGm.) Miss Campbell, Mrs. Foote.
- 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 Campbell, Mrs. Foote.
- 33su. Intermediate Swimming. Class instruction given. Shower bath fee, \$1. (No cred.; prereq., swim. exam., phys. exam.; TTh 2:30; 51WGm.) Miss Campbell.
- 34su. Advanced Swimming. Class instruction given. Shower bath fee, \$1. (No cred.; prereq., swim. exam., phys. exam.; TTh VII; 51WGm.) Mrs. Foote.
- 35su. Technique of Swimming Strokes. Technique of swimming, diving, and life saving. Theory and practice. Shower bath fee, \$2. (1 cred.; prereq., swim. exam., phys. exam.; MTWThF VI; 201, 51WGm.) Mrs. Foote.

SECOND TERM

Arrangements will be made for classes in tennis and swimming provided there is sufficient interest to warrant it.

- 6su. Tennis for Beginners. Class instruction in rules and fundamental technique. Fee, \$1. (No cred.; no prereq.; MWF III.)
- 30su. General Swimming. No registration necessary. (No cred.; no prereq.; MWF 12:00-12:30; 51 WGm.)
- 32su. Elementary Swimming. Class instruction given. Shower bath fee, \$1.50. (No cred.; prereq., phys. exam.; MWF IV; 51WGm.)

THE SCHOOL OF BUSINESS

GENERAL INFORMATION

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. 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 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.

For description of courses see Economics, page 31, in Science, Literature, and the Arts section.

FIRST TERM

- 3su. The Mechanism of Exchange.
- 6su. Principles of Economics.
- 24su. Survey of Accounting for Teachers.
- 101su.(103) Advanced General Economics.
- 130su. Survey of Cost Accounting.
- 153su. The Trust Problem.
- 154su. Public Utilities.
- 155su. Corporation Finance.
- 161su. Labor Problems.
- 170su. Modern Economic Reform Movements.
- 172su. Economics of Transportation.
- 176su. Commercial Policies.
- 190su. Public Finance (Taxation).

SECOND TERM

- 7su. Principles of Economics.
- 85su. Principles of Marketing.
- 102su. (104) Advanced General Economics.
- 141su. Monetary and Banking Policy.
- 146su. Investments.
- 149su. Business Cycles.

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 primary purpose of the institute is to study the physical, mental, and social development of the young child from as many angles as possible and to bring to the people of the state through its teaching and extension services the information accumulated in the past and the information to be accumulated through the research program of the institute. 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, and Sociology. As part of its program, the institute maintains a nursery school for children between two and six 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. The institute will offer the following summer courses.

- 1su. Care and Management of the Small Child. A consideration of the development and management of the young child from the point of view of the home. A brief discussion of the physical and mental development of the young child will be followed by a study of the techniques of good and bad management. Behavior problems in their various aspects will be considered, together with appropriate materials for conditioning desirable behavior. Exhibits of play material in the shape of games and story telling will be given. Further opportunities for seeing such material in use will be arranged through observation in the nursery school. Regarded as equivalent to a two-credit course in calculating fees. (No cred.; no prereq.; TTh VII-VIII.) Mr. Anderson and staff.
- 50su. Nursery School Methods. A consideration of the materials and methods utilized in the teaching of small children in groups and as individuals. The nursery school will be used for illustration and observation. (3 cred.; jr., sr.; prereq., 6 cred. in psy. and 5 cred. in soc. sci.; MTWThF IV and observation hours as arranged.) Miss Dixon.
- 60su. The 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.; MTFS I; 213HE.) Miss White, Miss Dixon.
- 173su. Technique and Practice of Parental Education. A study of the content and methods involved in courses planned for parents in the training of the young child together with the technique of organizing and conducting such study groups. Limited enrolment. Permission of

the instructor necessary. (2 cred.; jr., sr., grad.; prereq., 15 cred. in ed. or psy. or soc. or prev. med., permission of instructor; 100CWI.) Miss Dixon.

The following course in Home Economics Education is given under the auspices of the institute:

H.E.Ed.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 small children, emphasis being placed on the pre-school child. Lectures, observations in the nursery school, and reports. Limited to 50. (3 cred.; jr., sr.; prereq., Psy. 1-2; MTWF VI and two hours observation as arranged; 213HE.) Mr. Anderson.

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. Full descriptions with a statement of the prerequisites are to be found in the departmental announcements.

1. Anatomy 133su. Anatomy of the Fetus and Child. Dr. Scammon.
2. Art Education 36asu. Cardboard and Paper Construction. Miss Sutorius.
3. Education 7su. Children's Literature. Miss Kilgore.
4. Education 103su. History of Modern Elementary Education. Miss Alexander.
5. Educational Psychology 57su. Ontogenetic Psychology, with emphasis on the activity of the pre-school child. Mr. Olson.
6. Educational Psychology 192su. Behavior Problems in Children. Dr. Blanton.
7. Education 141su. Phonetic Disorders of Speech. Dr. Blanton.
8. Home Economics 19su. Nutritional Aspects of Health. Miss Leichsenring.
9. Preventive Medicine 58su. Maternal and Child Hygiene. Dr. Boynton.
10. Sociology 60su. Child Welfare. Mrs. Doyle.

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