GEOLoGY

PROFESSOR, J. P. ROWE. ASSISTANT PROFESSOR, ARTHUR C. BEVAN.

Those who do major work in this department must take Mineralogy 24, Chemistry 11, Zoology 11, General Botany 11 one year, Physics 11 and should have at least two years' work in Modern Language.

For Undergraduates

Geology:
11. General Geology. 3 Q. Autumn, winter and spring. Continuous. 12 cr. Open to all students. Mr. Rowe and Mr. Bevan.

12. Teachers’ Course in Physiography. 1 Q. Autumn. 4 cr. Open to all students. Mr. Bevan.

Note: This course, together with the similar courses of the same number offered in Botany and Zoology may be advantageously taken as a year's course in the teaching of the natural sciences.

15. Physiography. 1 Q. Winter; summer. 3 cr. Open to all students. Mr. Bevan.

16. Geography and Geology of Montana. 1 Q. Repeated each quarter. 3 cr. Open to all students. Mr. Rowe.


22. Historical Geology. 2 Q. Winter and spring. 10 cr. Prerequisite, Geology 13. Mr. Bevan.

111. Invertebrate Paleontology. 2 Q. Winter and spring. 10 cr. Prerequisite, Invertebrate Zoology and Geology 11. Mr. Bevan.

Mineralogy and Economic Geology:

Those who do major work in Mineralogy or Economic Geology should take Mathematics 11, 12, 13, 16 and Chemistry 13, 15, 17, together with two years of French or Spanish.

24. Physical Mineralogy. 1 Q. Repeated each quarter. 5 cr. Prerequisite, General Chemistry. Mr. Rowe.

26. Petrology. 1 Q. Autumn. 3 cr. Mr. Rowe and Mr. Bevan.

25. Blowpipe Analysis. 1 Q. Winter. 3 cr. Prerequisite, Geology 17. Mr. Rowe.

101. Economic Geology. 1 Q. Spring. 3 cr. Prerequisite, Geology 11 and 17. Mr. Rowe.

104. Advanced Mineralogy. 1 Q. Winter. Cr. to be arranged. Prerequisite, Mineralogy 17. Mr. Rowe.

For Undergraduates and Graduates

102. Petroleum Geology. 1 Q. Spring. 3 cr. Prerequisite, Geology 11, 21, 22, 24, and 26. Mr. Rowe.

103. Genesis of Ore Deposits. 1 Q. Autumn; winter. 4 to 6 cr. Prerequisite, Geology 11, 17, 21, and 24. Mr. Rowe.

105. Mining Mineral and Geological Law. 1 Q. Winter. 3 cr. Prerequisite, Geology 11, 17 and 130. Mr. Rowe.
COURSES IN HISTORY

128. History of Geology. 1 Q. Spring. 3 cr. Mr. Rowe.
131. Petrography. 1 Q. Autumn. 3 cr. Prerequisite, Geology 24. Mr. Bevan.
132. Advanced Petrography. 1 Q. Winter; spring. 3-4 cr. Prerequisite, Geology 131. Mr. Bevan.
135. Field Methods. 1 Q. Spring. 3 cr. Prerequisite, Geology 11, 13, 17 and 21. Mr. Bevan.

HISTORY AND POLITICAL SCIENCE

Professor, Paul C. Phillips. Assistant Professor, J. E. Miller.

Students who do major work in History and Political Science are required to offer 45 credit hours in the department. A reading knowledge of French is desirable and should be acquired as soon as possible. Majors in the department may specialize in either American History, European History, or Political Science but they are urged to obtain a broad knowledge of the whole field of history and politics.

Courses 11, 12, and 13 are open to all first year students. Course 21 is open to second year students without further prerequisite. For students in modern languages, courses in European History are advised while majors in the department of English and pre-legal students will find the courses in English History and Politics more desirable.

11a. Modern Europe (1450-1789). 1 Q. Autumn. 5 cr. Open to all students. A study of the Renaissance: the new intellectual and cultural ideas of the period, new economic and social organizations, and the formation of modern European states systems. Followed by a survey of the development of Europe before the French Revolution: social, political, and economic. Special attention will be paid to the history of France and Germany. Mr. Phillips.

11b. Modern Europe (1789-1920). 1 Q. Winter. 5 cr. Open to all students. A study of the French Revolution: new social and economic ideas. For the nineteenth century attention will be given to social and political forces, to the growth of the spirit of nationality, the conflict of imperialism and liberalism, and its culmination in the world war. Mr. Phillips.

12. Medieval Europe. 1 Q. Spring. 4 cr. TWMThF. Open to all students. The political history of Europe from the barbarian invasion to the voyages of discovery: a survey of medieval institutions: feudalism, the church, monasticism, medieval trade and commerce, the agrarian system. Mr. Miller.

13a. English History to 1660. 1 Q. Fall. 5 cr. Open to all students. The political history of England from earliest times to the Restoration with attention to the larger social, economic, and religious movements. Mr. Miller.
13b. English History (1660-1921). 1 Q. Winter. 5 cr. Open to all students. The modern history of England to the present time with attention to imperial and colonial development. Mr. Miller.

14. The North American Colonies (1492-1783). 1 Q. Spring. 4 cr. MTWTh. Open to all students. A study of English, French, Spanish, and Russian colonizing activities in North America. The course includes a survey of colonial policies and rivalries. Particular attention will be given to the influence of the Indian trade as a factor in colonization. Mr. Phillips.

15. Ancient History. 1 Q. Winter. 5 cr. Prerequisite, sophomore standing. Emphasis will be on the cultural development and the social and political institutions that influence modern life. Mr.

21a. United States History (1783-1870). 1 Q. Autumn. 4 cr. MTTh.F. Prerequisite, sophomore standing. Particular attention is given to the organization of the federal government and its underlying principles, the development of national feeling, the growth of democracy, the influence of the west, the slavery controversy, secession and reconstruction. Mr. Phillips.

21b. Contemporary United States History (1870-1920). 1 Q. Winter. 4 cr. MTTh.F. Prerequisite, sophomore standing. A survey of the United States at the close of reconstruction, with emphasis on the growth of the west. The influence of big business, the reaction of reform movements, particularly the Bryan democracy, the Roosevelt policies and the new radicalism of the Wilson administration, the World War and the new international problems that confront the United States. Mr. Phillips.

22. Montana History and Government. 1 Q. Spring. 4 cr. MTTh.F. Repeated in summer, 2½ cr. Open to all students. The exploration of Montana, early traders and missionaries, the gold mining era, territorial organization and development, and statehood. The course will close with a survey of economic, social, and political development and a discussion of present day problems. Mr. Phillips.

23. The Teaching of History. 1 Q. Winter; summer. 2 cr. TTh. Prerequisite, 15 hours of History. A course in special method for teachers of history. Mr. Phillips.

27a. The Constitutional History of England. 1 Q. Fall. 3 cr. MWF. Open to students with junior standing and, with permission, to others who have completed eight hours in the department. A study of the origin and growth of English institutions to the magna charta; the Anglo-Saxons, the feudal system; the early church; the beginnings of the jury system. Mr. Miller.

27b. The Constitutional History of England. 1 Q. Winter. 3 cr. MWF. Prerequisite, History 27a. English institutions from Magna Charta to the Great Revolution: the rise of parliament, the development of the common law, the church in the middle ages, the reformation. Mr. Miller.
27c. The Constitutional History of England. 1 Q. Spring. 3 cr. MWF. Prerequisite, 27b, English Institutions from the Great Revolution to the Present Time: the cabinet system, the industrial revolution, social, legal and parliamentary reform, home rule, the imperial government today. Mr. Miller.

102. History of the Northwest. 1 Q. Autumn. 3 cr. TTh at 10 and a third period. Prerequisite, History 21. An advanced course for the study of the most significant factors in the history of the northwestern states and their relation to the nation. Mr. Phillips.

104. Seminar in American History. Credit to be arranged. Open to qualified seniors and graduate students. The work will be purely individual and adapted to suit the needs of the student. Mr. Phillips.

105. Seminar in European History. Credit to be arranged. Open to seniors and graduate students. Problems for investigation by the individual student in the field of Continental European or of English History.

Courses in Political Science.

17. American Government and Politics. 1 Q. Spring; summer. 5 cr. Daily. Prerequisite, 8 hours History and at least a high school course in American History. The first part of the course will be devoted to the organization and functions of the federal government, the second to that of the state. A brief survey will be made of problems of county and municipal government. Mr. Phillips.

19. Elements of Political Science. 1 Q. Fall. 4 cr. MTWTh at 9. An introductory study of the origin and nature of the state, sovereignty, forms of government, constitution, citizenship, the distribution of powers, suffrage. Mr. Miller.


50. International Public Law. 1 Q. Winter. 4 cr. Prerequisite, 15 hours in history or political science. A study of the laws of nations, in relation to peace, war, and neutrality. Mr. Phillips omitted in 1920-21.

53. International Relations. 1 Q. MTWT at 9. Spring. 4 cr. Prerequisite, 8 hours History or junior standing. The present international situation and its historic background: the development of imperialism and world politics, the diplomatic relations and problems of the United States. Mr. Miller.
HOME ECONOMICS

Professor, EMELINE S. WHITCOMB (Chairman). Assistant Professors, Ethel Clarke (Director of Craig Hall), KATHERINE DAUM. Instructor, Ethel G. Van Deusen.

The aim of the department is threefold: to train teachers for the secondary and normal schools and colleges, to train dietitians and managers for institutions including hospitals, dormitories, tea and lunch rooms, and cafeterias; to liberalize every woman’s education by giving her an appreciation of her greatest profession, that of home making. For this last named purpose, students may elect courses 11, 11a, 12, 13abc, 14, 19, 24, 32ab, 122, 123.

Students who minor in this department are required to take courses 12, 13abc, 14, 19, 21, 22, and 117.

Students who minor in this department to secure the teachers’ certificate are required to take the above courses and in addition, course 124.

Curriculum for training teachers of Home Economics for the secondary and normal schools and colleges:

**CURRICULUM**

**FIRST YEAR**

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Autumn Credits</th>
<th>Winter Credits</th>
<th>Spring Credits</th>
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<tbody>
<tr>
<td>General Chemistry (11)</td>
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<tr>
<td>or Inorganic Chemistry and Qualitative Analysis (13)</td>
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<td>5</td>
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<tr>
<td>History and Appreciation of Art (11)</td>
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<tr>
<td>Physical Education (12)</td>
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<td></td>
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</tr>
<tr>
<td>Foods (13ab)</td>
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<tr>
<td>English (11ab)</td>
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<tr>
<td>Economic Botany (14)</td>
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**SECOND YEAR**

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<tr>
<td>Physiology of the Human Body (21)</td>
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<tr>
<td>Household Physics (2)</td>
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<tr>
<td>Modern Language</td>
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<tr>
<td>Color and Design</td>
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<td></td>
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<tr>
<td>Physical Education (12)</td>
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<td>1</td>
<td>1</td>
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<td>Organic Chemistry (19)</td>
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<tr>
<td>Foods (21)</td>
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<tr>
<td>Elementary Costume Design (14)</td>
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<td>3</td>
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<tr>
<td>Physiological Chemistry (103)</td>
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<tr>
<td>Textile Chemistry (106)</td>
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<td>English</td>
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**THIRD YEAR**

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<th>Autumn Credits</th>
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<tr>
<td>General Bacteriology (19)</td>
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<tr>
<td>General Psychology (11)</td>
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<tr>
<td>Textile Study (117)</td>
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## COURSES IN HOME ECONOMICS

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<tr>
<td>History of Education (14)</td>
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<tr>
<td>Advanced Costume Design (120)</td>
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<tr>
<td>The House (19)</td>
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<tr>
<td>Principles of Education (118)</td>
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</tr>
<tr>
<td>Educational Psychology (119)</td>
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<tr>
<td>Clothing (187)</td>
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<tr>
<td>Dietetics (122)</td>
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### FOURTH YEAR

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<th>Course</th>
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<tbody>
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<td>The High School (122)</td>
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<tr>
<td>Household Management (124)</td>
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<tr>
<td>Health Education (123)</td>
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<tr>
<td>Sociology (161)</td>
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<td>Education (126)</td>
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<tr>
<td>School Hygiene (130)</td>
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<tr>
<td>Foods (121)</td>
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<tr>
<td>Economics (14)</td>
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<tr>
<td>Nutrition Seminar (237)</td>
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<tr>
<td>Electives</td>
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## CURRICULUM FOR INSTITUTIONAL MANAGEMENT

Teachers' Curriculum and Institutional Management Curriculum identical for the first two years.

### THIRD YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Autumn</th>
<th>Winter</th>
<th>Spring</th>
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<tbody>
<tr>
<td>Economics (14)</td>
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<tr>
<td>General Psychology (11)</td>
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<tr>
<td>General Bacteriology (19)</td>
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<td>Textiles (117)</td>
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<tr>
<td>Protozoology (16)</td>
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<td>The House (19)</td>
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<tr>
<td>Dietetics (122)</td>
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<tr>
<td>Commercial Law (25)</td>
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<tr>
<td>Co-operation and Marketing (173)</td>
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### FOURTH YEAR

<table>
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<tr>
<th>Course</th>
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<tr>
<td>Economics (161)</td>
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<td>Health Education (123)</td>
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<td>Household Management (124)</td>
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<td>Elective</td>
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<tr>
<td>Institutional Management (133ab)</td>
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<tr>
<td>Foods (121)</td>
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<td>4</td>
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<td>Nutrition Seminar (237)</td>
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<td>Electives</td>
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<tr>
<td>Institutional Cookery (135)</td>
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</table>

**Foods**

11b. **Survey of Home Economics.** 1 Q. Autumn. A course setting forth the aims, subject matter and opportunities in the field of Home Economics. No credit.

13ab. **Foods.** 2 Q. Winter; spring. Continuous. 10 cr. Fee $7.00. Open to all students. An introduction to the study of foods from a scientific and economic aspect with emphasis placed on composition, functions and place in the diet.
13c. Foods. 1 Q. Summer. 3 cr. Fee $7.00. Open to all students. A study of the principles of preservation, including home and commercial methods, applied to all perishable foods.

21. Foods. 1 Q. Winter. 3 cr. Fee $7.00. Prerequisites, Chemistry 11, Household Physics, Foods 13abc. Special food problems are assigned for individual investigation.

22. Dietetics. 4 cr. Fee $3.50. Open to all students except those who do major work in this department. The course deals with the fundamental principles of adequate nutrition sufficiently elementary that no prerequisites are required. Given every quarter.

121. Foods. 1 Q. Winter. 3 cr. Fee $7.00. Special emphasis is placed upon the effect that varying physical and chemical factors have in food preparation.

122. Dietetics. 1 Q. Spring; summer. 4 to 5 cr. Fee $7.00. Prerequisites, Foods 13abc, Chemistry 19 and 103. A course given to the scientific study of foods, as they relate to the dietary standards of families under various conditions of health and environment, with special emphasis placed on the proper feeding of children. A study of digestion and metabolism.

123. Health Education. 1 Q. Summer; autumn. 4 cr. Fee $7.00. Prerequisite, Dietetics. Includes symptoms of disease, prophylactics, first aid, nursing and feeding of the sick in the home. Mr. Schreiber, Miss Daum.

129. Food Demonstration. 1 Q. Spring. 2 cr. Fee $5.00. For juniors and seniors. Includes choice of topics, materials and methods of presentation to the public.

135. Institutional Cookery. 1 Q. Winter. 5 cr. The application of scientific, economic and sociological principles to the feeding of large numbers of people.

226. Food Seminar for High School Teachers. Summer (first term). 3 cr. Fee $3.00. Includes a survey of the food situation of the world. The supplies influence upon food study courses; methods of production, manufacture, preservation, distribution, economic uses, nutritive value and the influence of this knowledge upon everyday living.

237. Nutrition Seminar. 1 Q. Spring. 4 cr. Prerequisites, Home Economics 122-123, Chemistry 103.

Clothing

11. Clothing. 1 Q. Autumn. 3 cr. Fee $1.00. Required of all those who do major work in this department who have not had high school sewing. A study of the development of textile industries and the social and economic phases of the manufacture of fabrics and the selection of materials.

11a. Clothing. 1 Q. Autumn; winter. 3 cr. Open to all students.
No prerequisites. The value of the different textile fibers and their application to making dresses.

12. **Color and Design.** 1 Q. Autumn. 3 cr. Prerequisite, History and Appreciation of Art 11. Composition and color studied through the use of masterpieces and the application of Art Principles to original designs.

14. **Elementary Costume Design.** 1 Q. Winter. 3 cr. Prerequisite, Color and Design 12. Principles of Composition, study of notan and color in their application to patterns for fabrics and house furnishings.

32ab. **Millinery.** 1 Q. Autumn; spring; summer. 3 cr. Fee $2.00. This course will include both design and composition; a study is made of materials, stitches, frames and trimming. Emphasis is laid on the application of art principles to meet individual requirements.

117. **Textile Study and Clothing.** 1 Q. Autumn; summer. 3 to 5 cr. Fee $2.00. Prerequisite, 105. Comprising a study of fibers, their manufacture and use, physical and chemical tests to aid in selection of clothing.

120. **Advanced Costume Design.** 1 Q. Winter. 4 cr. Prerequisite, 117. Design in costume; historic examples; essentials of modern costume, aesthetic and economic; original designs; tissue paper modeling; construction of afternoon and evening dresses.

227. **Clothing.** 1 Q. Spring. 4 to 5 cr. Prerequisite, 120. The economics of the textiles and clothing industry. Garments constructed under shop conditions.

128. **Clothing Demonstration.** 1 Q. Spring; summer. 2 cr. Fee $2.00. Preparation of textile material and clothing for lecture demonstration and exhibit work.

231. **Clothing Seminar for High School Teachers.** Summer (first term). 3 cr. Fee $2.00. Including a survey of the clothing field and the problems of modern industry, from the economic and sociological aspects; and how the necessary standardization, legislation and conservation affect clothing courses.

**Shelter**

19. **The House.** 1 Q. Winter. 5 cr. The aesthetic, economic and hygienic essentials in house planning, sanitation and decoration, and municipal problems.

124. **Household Management.** 1 Q. Autumn. 5 cr. Prerequisites, Home Economics 19, 122, 123. Aim is to define the profession of homemaking, emphasizing woman as the chief executive officer, financier and educator.

133ab. **Institutional Management.** 2 Q. Winter; spring. Continuous. 10 cr. Prerequisites, 19, 122, 123, 124. Includes organization, management and equipment of special types of institutions. Examples, dormitories, hospitals, tea rooms, cafeterias, hotel dining rooms.
**LATIN AND GREEK**

Not given in 1920

Those who do major work in this department must take in Latin courses 11, 13, 14, 15, 16, 17, 18, 19, 12a, 12b, 12c, and the courses in Greek and Roman Life. Eighteen credits in Greek or Modern Language must also be taken.

For a Minor, a student must take at least fifteen credits in this department.

To be recommended as qualified to teach Latin in High Schools, there is required at least the successful completion of Courses 11, 13, 14, 12a, 12b, 12c, or their equivalents.

**Latin:**

Note—Courses 11, 13, 14, 12a, 12b, 12c are designed especially for first-year work, to give a preliminary grammatical review; but students of exceptionally good preparation and aptitude for the work may take other courses first if circumstances require such a departure from the desirable order of work. Students taking Latin as their major subject should, as far as possible, take the courses in the order presented below; but the courses are open to students in any college year if they are prepared to take the work with profit. The prerequisite for any course, except 20, 21, 22, is the usual four years' Latin work in secondary schools.

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>11. Cicero</td>
<td>Autumn</td>
<td>3</td>
<td>De Amicitia.</td>
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<tr>
<td>12b. Composition</td>
<td>Winter</td>
<td>2</td>
<td>Continuation of 12a.</td>
</tr>
<tr>
<td>12c. Composition</td>
<td>Spring</td>
<td>2</td>
<td>Continuation of 12b.</td>
</tr>
<tr>
<td>14. Livy</td>
<td>Spring</td>
<td>3</td>
<td>Selections from Livy.</td>
</tr>
<tr>
<td>15. Horace</td>
<td>Autumn</td>
<td>3</td>
<td>Selections from Epodes and Odes.</td>
</tr>
<tr>
<td>17. Tacitus</td>
<td>Spring</td>
<td>3</td>
<td>Agricola.</td>
</tr>
<tr>
<td>19. Comedy</td>
<td>Winter</td>
<td>3</td>
<td>*One play each of Plautus and Terence.</td>
</tr>
<tr>
<td>20. Roman Life</td>
<td>Winter</td>
<td>3</td>
<td>Open to all students. No knowledge of Latin required.</td>
</tr>
</tbody>
</table>
21. First Year Elementary Latin. 3 Q. Autumn, winter and spring. Continuous course. 9 cr. Open to all students.

22a. Second Year Elementary Latin. 1 Q. Autumn. 3 cr.
22b. Second Year Elementary Latin. 1 Q. Winter. 3 cr.
22c. Second Year Elementary Latin. 1 Q. Spring. 3 cr.

Greek:

11. Elementary Greek. 1 Q. Autumn. 3 cr. White's First Greek Book.

12. Elementary Greek. 1 Q. Winter. 3 cr. Continuation of 11.
13. Elementary Greek. 1 Q. Spring. 3 cr. Continuation of 12.
14. Second Year Greek. 1 Q. Autumn. 3 cr. Xenophon's Anabasis.

15. Second Year Greek. 1 Q. Winter. 3 cr. Anabasis continued. Iliad begun.

16. Second Year Greek. 1 Q. Spring. 3 cr. Iliad continued.
17. Greek Life. 1 Q. Autumn. 3 cr. Private life of Greeks. Open to all students. No knowledge of Greek required.
LIBRARY ECONOMY

INSTRUCTOR, GERTRUDE BUCKHOUS. ASSISTANT.

1. General Reference. 1 Q. Autumn; spring. 1 cr. Open to all students. Lectures, reading and reference work. Lectures will be given on the following topics: The arrangement of the library and the privileges granted students, the use and value of the card catalogue, dictionaries, and encyclopedias, Poole's Index and periodical literature, classification, cataloguing, atlases and gazetteers, note-taking, book-binding and care of books, government publications and reference books on English and American literature, history and science. One lecture or recitation a week. One afternoon laboratory work. Miss Buckhous.

The following are required of those who do major work in this department: Examinations or two years of college work. Satisfactory reports on maturity of mind and earnestness of purpose. Ability to use a typewriter and to write a good library hand. College courses desired; French and German, one year; History, Literature and English (as much advanced work as possible). General courses in Physics, Chemistry, Geology, Biology, Psychology, Economics and Sociology, Education, Modern Languages, and Art.

12. Reference. 1 Q. Autumn. 3 cr. Miss Buckhous.
15. Library Economy. 1 Q. Winter. 3 cr. Miss Buckhous.
13. Reference. 1 Q. Spring. 3 cr. Prerequisite, 12. Miss Buckhous.
14. Classification. 1 Q. Winter. 2 cr.
19. Classification and Cataloguing. 1 Q. Spring. 2 cr. Prerequisite, 14.
17. Reference. 1 Q. Autumn. 3 cr. Open to seniors. Prerequisites, 12 and 13. Miss Buckhous.

16. Classification and Cataloguing. 1 Q. Winter. 3 cr. Open to seniors. Prerequisites, 14 and 10.
18. Library Administration. 1 Q. Spring. 2 cr. Open to seniors. Includes County Library Administration and County Library Law. Miss Buckhous.
22. Book Selection. 1 Q. Winter. 1 cr. Open to seniors.

Those who do major work in this department are required to have a minimum of 45 credits. This should include courses 12, 13, 21, 22, 23, and 24. The remaining credits should be selected in consultation with the instructors in charge of the courses which the student proposes to select. Courses 10, 11, and A11 may not be counted as part of the requirement for a major in Mathematics.

The mathematics library contains complete sets of all the American mathematical journals, and complete sets of several of the most important foreign journals, such as Crelle, Annalen, Liouville, Fortschritte, and others. The current volumes of all the important mathematical journals are in the library. The important new books are being added. It is usually possible to add books as the need for them arises.

For Undergraduates

10. Intermediate Algebra. 1 Q. 5 cr. Prerequisite, 1 unit of entrance Algebra. For students entering with only one year of Algebra this is a prerequisite for all other courses in Mathematics. Given every quarter.

11. Solid Geometry. 1 Q. 5 cr. Winter; summer.

12. College Algebra. 1 Q. 5 cr. Prerequisites, course 10 or 1½ units of entrance Algebra. (The advanced part of the entrance Algebra should be taken not earlier than the third year of the high school course.) Autumn; winter; spring.

13. Plane Trigonometry. 1 Q. 5 cr. Given every quarter.

14. Spherical Trigonometry. 1 Q. 5 cr. Autumn; winter.

15a. Forestry Computation. 1 Q. This course carries no University credit.

15b. Trigonometry for Forest Rangers. 1 Q. 3 cr. Winter.


22. Differential Calculus. 1 Q. 5 cr. Autumn. Prerequisite, Course 21.

23. Integral Calculus. 1 Q. 5 cr. Winter. Prerequisite, course 22.


25. Solid Analytic Geometry. 1 Q. 5 cr. Prerequisite, course 22.

26. Analytic Mechanics, A. 1 Q. 5 cr. Prerequisite, course 23.

27. Analytic Mechanics, B. 1 Q. 5 cr. Prerequisite, course 26.
31. Teaching of Secondary Mathematics. 1 Q. 5 cr. Spring; summer.

For Undergraduates and Graduates


103. Synthetic Projective Geometry. 1 Q. 5 cr. Autumn.


105. Theory of Determinants. 1 Q. 5 cr.

106. The Teaching of Arithmetic. 1 Q. 5 cr. Spring. Deals with historical and present aspects of the subject. Particular attention is paid to Standard Tests and Measurements of Arithmetic ability.

For Graduates

240. Functions of a Real Variable. 1 Q. 5 cr.

241. Functions of a Complex Variable. 1 Q. 5 cr.


243. Vector Analysis. 1 Q. 5 cr.

245. Theory of Sets of Points. 1 Q. 5 cr.

ASTRONOMY

A11. Descriptive Astronomy. 1 Q. 5 cr. Autumn; spring.

MILITARY SCIENCE AND TACTICS


The University maintains an infantry unit of the Reserve Officers' Training Corps, senior division, organized under authority of the National Defense Act.

"The primary object of the Reserve Officers' Training Corps is to provide systematic military training at civil educational institutions for the purpose of qualifying selected students of such institutions as reserve officers in the military forces of the United States. It is intended to attain this object during the time that students are pursuing their general or professional studies with the least practicable interference with their civil careers, by employing methods designed to fit men, physically, mentally and morally, for pursuits of peace as well as pursuits of war. It is believed that such military training will aid greatly in the development of better citizens. It should be the aim of educational institutions to maintain one or more units of the Reserve Officers' Training Corps in order that in time the national emergency there may be instantly available a large number of educated men, physically efficient and trained in the fundamentals of military science and tactics and fitted to lead intelligently the units of the armies upon which the safety of the country will depend."—Extract, Special Regulations, No. 44, War Department.

All resident male students of freshman and sophomore standing are required to take the R. O. T. C. course except:

1. Students who have reached the age of 27 years at the beginning of the quarter.
2. Students enrolled for less than eight (8) quarter credits.
3. Students granted permission to postpone military drill or substitute other courses because of physical disability.
4. Students who have been in residence in this institution for not less than six quarters (summer quarters not counted) carrying not less than twelve (12) credits per quarter and who have received 75 quarter credits (but who have not as yet full junior standing).
5. Students who have completed two (2) years' training under P. M. S. and T. at some other institution for which credit has been given by this institution.
6. Students who have served in any branch of the Army or Navy, including the Students' Army Training Corps, during the World War.
7. Students who are not citizens of the United States.
8. "No member of the Army, Navy, or Marine Corps of the United States or of the National Guard, Naval Militia, or Naval Reserve or Reserve Officers of the military or naval forces of the United States shall
be eligible for membership in the Reserve Officers' Training Corps."—
Extract, Special Regulations, No. 44, War Department.

The requirements of military drill for special and unclassified
students will be subject to the direction of the committee on admission
and registration when not otherwise covered by above rules.

Members of the R. O. T. C. are provided with uniform, arms and
equipment by the government.

The work required during the first two years covers what is known
as the Basic Course. Students who have completed the Basic Course
at this or some other institution are eligible for the Advanced Course,
which covers two additional years. Before being admitted to the Ad-
vanced Course, however, they must execute the following written agree­
ment:

\[
\begin{align*}
&\text{Missoula, Montana,} \\
&(\text{Date})
\end{align*}
\]

In consideration of commutation of subsistence to be furnished me
in accordance with law, I hereby agree to continue in the Reserve Of­
icers' Training Corps during the remainder of my course in the Uni­
versity of Montana (not to exceed two years) to devote five hours per
week during such period to the training prescribed, and to pursue the
course of camp training during such period, prescribed by the Secre­
tary of War.

Witness.............................................. (Sig)......................................................

Commutation is fixed from time to time by the Secretary of War
and at present amounts to about $12 per month, payable quarterly.
Advanced students are required to attend but one summer camp, the
government furnishing transportation, subsistence and uniform. In de­
termining eligibility for the Advanced Course credit may be given for
service in the S. A. T. C.

Basic Course

Required of Freshmen and Sophomores.

11a. Military Science and Tactics. 1 Q. Autumn. 1 cr. Practical
and theoretical, three hours per week. Physical drill, infantry drill,
care of arms and equipment; lectures and moving pictures on organiza­
tion, military courtesy and discipline, the rifle, the bayonet and special
infantry weapons.

11b. Military Science and Tactics. 1 Q. Winter. 1 cr. Practical
and theoretical, three hours per week. Lectures and moving pictures on
morale, infantry equipment, interior guard duty, small arms firing,
personal hygiene, first aid and sanitation. Recitations in infantry drill
regulations. Preliminary target exercises, gallery practice, signalling.

11c. Military Science and Tactics. 1 Q. Spring. 1 cr. Practical,
three hours per week. Infantry drill to include the School of the Bat­
COURSES IN MILITARY SCIENCE

tation; practice marches with advance, rear and flank guards; patrols; outposts; guard mounting, parade, review, inspection; combat; signalling; tent pitching; target practice.

12a. Military Science and Tactics. 1 Q. Autumn. 1 cr. Practical and theoretical, three hours per week. Sophomores participate in drills and practical work prescribed for freshmen, serving as non-commissioned officers. Small arms firing; personal hygiene, first aid and sanitation; interior guard duty; morale.

12b. Military Science and Tactics. 1 Q. Winter. 1 cr. Practical and theoretical, three hours per week. Sophomores participate in the work of freshmen, serving as non-commissioned officers. Recitations in infantry drill regulations. Conferences and map problems in minor tactics (advance flank and rear guards; outposts; patrols; approach marches and developments; combat). Liaison for all arms. Topography and map reading. Signalling. Field Engineering.

12c. Military Science and Tactics. 1 Q. Spring. 1 cr. Practical, three hours per week. Sophomores participate in the work of freshmen, serving as non-commissioned officers. Orders and messages. The bayonet. The hand grenade. Signalling.

Advanced Course

Elective. Prerequisite, courses 11 and 12.


13c. Military Science and Tactics. 1 Q. Spring. 1 cr. Practical, five hours per week. Juniors participate in drills and practical work of lower classmen, serving as non-commissioned officers and officers. Voice
culture and commands. Care and handling of arms and equipment. Tactical walks. Small arms firing. Musketry problems.

14a. Military Science and Tactics. 1 Q. Autumn. 1 cr. Practical and theoretical, five hours per week. Seniors participate in drills and practical work of lower classmen, serving as officers. Topography and map reading. Orders and messages. Tactical walks. Conferences on combat of small units, scouting and patrolling, and musketry.


MODERN LANGUAGES


German

Instruction in German at the State University is suspended until further notice by order of the State Council of Defense.

French

Those who do major work in this department must take the following courses: 11, 13, 15, 19. In addition they are required to take two years of one other modern foreign language and one course in the History of Europe.

11a. Elementary French. 1 Q. Autumn, winter or spring. 5 cr. Essentials of French grammar, practice in reading and conversation. Mr. Lussky, Mr. Blankenagel, Miss Dexter, Miss Jacobson.

11b. Elementary French. 1 Q. Autumn, winter or spring. 5 cr. Continuation of 11a. Selections from modern French authors are read. Mr. Lussky, Mr. Blankenagel, Miss Dexter.

13a. Intermediate French. 1 Q. Autumn, winter or spring. 5 cr. Prerequisite, Courses 11a and 11b, or two years of high school French. In this course the more difficult constructions of French grammar are studied. Selections from modern French authors are read, and practice in the spoken language is given. Mr. Lussky, Mr. Blankenagel.

13b. Intermediate French. 1 Q. Autumn, winter, spring. 5 cr. Continuation of 13a. Mr. Lussky, Mr. Blankenagel.

115. Advanced French. 3 Q. Autumn; winter; spring. 12 cr. Continuation of course 13 with increased emphasis on literary appreciation. Opportunity for practice in the spoken language is given. Composition is conducted in connection with this course. Mr. Lussky.

17. Technical French. 1, 2 or 3 Q. Credits based upon the amount of work done; but in no case will a student receive more than 3 credits in any one quarter. This course is designed for students who have had at least two years of college French or the equivalent, and who wish to do French reading in their major subjects. Mr. Blankenagel.

119-121. Special. 1, 2 or 3 Q. 4, 8 or 12 cr. Prerequisites, courses 11, 13, 15 or the equivalent. Courses 119 and 121 alternate with each other from year to year, and are arranged to meet the requirements of the students. In 1919-20 course 19 was given as a "Survey of Modern French Literature." Mr. Lussky.
Spanish

11a. Elementary Spanish. 1 Q. Autumn; winter or spring. 5 cr. Introduction to Spanish Grammar. Practice in reading and conversation. Mr. Scheuch, Miss Dexter, Miss Jacobson.

11b. Elementary Spanish. 1 Q. Autumn; winter or spring. 5 cr. Continuation of 11a. Selections from modern Spanish authors are read. Mr. Scheuch, Miss Dexter.

13a. Intermediate Spanish. 1 Q. Autumn; winter or spring. 5 cr. Prerequisite, Course 11 or two years of high school Spanish. In this course a more detailed study of Spanish grammar is taken up. Selections from modern Spanish authors are read. Practice in conversation is given. Mr. Scheuch, Miss Dexter.

13b. Intermediate Spanish. 1 Q. Autumn; winter or spring. 5 cr. Continuation of 13a. Mr. Scheuch, Miss Dexter.

115. Advanced Spanish. 3 Q. Autumn; winter or spring. 12 cr. Prerequisites, Courses 11, 13 or three years of high school Spanish. Continuation of Course 13 with increased emphasis on literary appreciation and oral work. Mr. Scheuch.

17. Technical Spanish. 1 2 or 3 Q. Credits based upon the amount of work done; but in no case will a student receive more than 3 credits in any one quarter. This course is designed for students who have had at least two years of college Spanish or the equivalent, and who wish to do Spanish reading in their major subjects. Mr. Scheuch.

119-121. Special. 1, 2 or 3 Q. 4, 8 or 12 cr. Prerequisites, Courses 11, 13, 15 or the equivalent. Courses 119 and 121 alternate with each other from year to year, and are arranged to meet the requirements of the students. Mr. Scheuch.

126. Teachers' Course. 1 Q. Winter or spring. 2 cr. Open to advanced students who intend to teach German, French or Spanish. Given by members of the department.

N. B. The courses in German are announced tentatively, pending action of the State Board of Education.
PHYSICAL EDUCATION

PROFESSOR, WILLIAM E. SCHREIBER. ASSISTANT PROFESSOR, LUCILLE LEYDA. INSTRUCTOR, B. W. BIERMAN. ASSISTANT, MADELINE KELLY.

The Department of Physical Education controls all the physical activities of the University under the following divisions:
1. Division of Inter-Collegiate athletics.
2. Division of Intra-Mural athletics for women.
3. Division of Intra-Mural athletics for men.
4. Division of physical training for women.
5. Division of physical training for men.
6. Division of training of teachers of Physical Education.

All students taking part in the work of the department are required to take the physical and medical examination provided by the department.

All freshman and sophomore men and women are required to take work in regular classes of the department and all special students whose rating would be in either of these classes must report for regular work. (Six credits required for graduation. Three periods per week for two years.)

Regular gymnasium costumes are required for both men and women and these should, under no conditions be ordered before consulting the instructor.

PROFESSIONAL COURSE

The University certificate in Physical Education is granted to University graduates who do major work in this department. This course is for the training of teachers of Physical Education for high schools, city supervisors, playground supervisors and instructors and athletic coaches.

ATHLETICS

All inter-collegiate athletics are under the supervision of the department, varsity teams being maintained in football, basketball, baseball, track, tennis and wrestling.

Facilities are provided for participation in athletic work for every member of the student body, intra-mural athletics being maintained in football (Rugby Association), hockey, basketball, baseball, track, tennis, cross country running, indoor baseball, boxing, wrestling, hand ball and gymnastics.

PHYSICAL EDUCATION—PRACTICE

For Men

11a. Freshman Physical Education. 1 Q. Autumn. 1 cr. Required work of all freshmen. Outdoor work in running and track athletic work:
Setting up drills and recreative games. Indoor work: Marching, floor drills and apparatus work on horse, bucks and parallel bars, recreative games. Short talks on Personal Hygiene and care of the body.

11b. Freshman Physical Education. 1 Q. Winter. 1 cr. Required work of all freshman men. Continuation of the indoor work of 11a.

11c. Freshman Physical Education. 1 Q. Spring. 1 cr. Required work of all freshman men. Continuation of 11b. Outdoor work in track athletics, baseball and cross country running.

12a. Sophomore Physical Education. 1 Q. Autumn. 1 cr. Required work of all sophomore men. Outdoor athletic work in track athletics, football, setting up drills and recreative games. Indoor work in military marching, floor drills and dumbbells, barbells and clubs; heavy apparatus work on horse bucks, rings, horizontal bars and parallel bars. Indoor athletic games. Wrestling and boxing.

12b. Sophomore Physical Education. 1 Q. Winter. 1 cr. Required work of all sophomore men. Continuation of the indoor work of 12a.

12c. Sophomore Physical Education. 1 Q. Spring. 1 cr. Required work of all sophomore men. Outdoor work in track athletics, baseball, handball, tennis and cross country running.

For Women

11a. Freshman Physical Education. 1 Q. Autumn. 1 cr. Required work of all freshman women. Outdoor work in hockey, tennis, track athletics, recreative games. Indoor work in Swedish gymnastics; instruction in proper walking and standing positions; elementary dancing; Swedish floor drills and apparatus work; gymnastic games.

11b. Freshman Physical Education. 1 Q. Winter. 1 cr. Required work of all freshman women. Continuation of the indoor work of 11a.

11c. Freshman Physical Education. 1 Q. Spring. 1 cr. Required work of all freshman women. Continuation of the work in 11b. Outdoor work in tennis, track athletics, baseball, hockey, handball and recreative games.

12a. Sophomore Physical Education. 1 Q. Autumn. 1 cr. Required work of all sophomore women. Outdoor work in hockey, tennis, baseball, and track athletics. Indoor work in gymnastics and floor drills with dumbbells, barbells and clubs. Light apparatus work on buck, horse, parallel bars; gymnastic dancing and gymnastic games.

12b. Sophomore Physical Education. 1 Q. Winter. 1 cr. Required work of all sophomore women. Continuation of the indoor work of 12a.

12c. Sophomore Physical Education. 1 Q. Spring. 1 cr. Required work of all sophomore women. Continuation of indoor work of 12b and
outdoor work in hockey, baseball, association football, track athletics, tennis, handball and recreative games.

**Men and Women**

15a. Advanced Gymnastics. 1 Q. Autumn. 1 cr. Open only to juniors and those showing marked ability in gymnastic work. Required of all students who do major work in Physical Education. Light and heavy gymnastic work; floor drills with apparatus dumb bells, bars and clubs. Apparatus work on bucks, mats, horse, parallel bars, rings and horizontal bar. Gymnastic and folk dancing. Gymnastic and athletic games.

15b. Advanced Gymnastics. 1 Q. Winter. 1 cr. Continuation of 15a.

15c. Advanced Gymnastics. 1 Q. Spring. 1 cr. Continuation of 15b.

**GENERAL ATHLETICS**

**Autumn—For Men**

Inter-collegiate football. Inter-fraternity contests in football, handball, association football and cross country running. Inter-class contests in the same sports.

**Autumn—For Women**

Inter-sorority contests in hockey, association football and baseball. Inter-class and intercollege contests in the same sports.

**Winter—For Men**

Inter-collegiate basket ball and wrestling. Inter-fraternity, inter-class and inter-college contests in basket ball, wrestling, boxing, indoor baseball and gymnastics.

**Winter—For Women**

Inter-sorority and inter-class contests in basket ball, indoor baseball and gymnastics.

**Spring—For Men**

Inter-collegiate baseball and track. Inter-fraternity, inter-class and inter-college contests in track, baseball, tennis, handball.

**Spring—For Women**

Inter-sorority and inter-class contests in track, tennis, handball, and baseball.
### CURRICULUM

#### FIRST YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Autumn Quarter Credits</th>
<th>Winter Quarter Credits</th>
<th>Spring Quarter Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English (11a, 11b, 11c)</td>
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<td>3</td>
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<tr>
<td>Chemistry (11)</td>
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<td>Biology (11)</td>
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<td>Military Science</td>
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#### SECOND YEAR

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<tbody>
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<td>Physiology (24)</td>
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<td>Psychology (11)</td>
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<td>Anatomy (20a, 20b, 20c)</td>
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<td>Physical Training (12)</td>
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<td>Military Science</td>
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<td>Hygiene and Sanitation</td>
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<td>Public Speaking</td>
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<tr>
<td>History of Physical Education (25)</td>
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#### THIRD YEAR

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<tbody>
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<td>Education (114, 118)</td>
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<td>Elective</td>
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<td>Anthropometry (31)</td>
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<td>First Aid (32)</td>
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<td>Equipment and Management (33)</td>
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<td>Advanced Gymnastics (15a, 15b, 15c)</td>
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<td>Playgrounds (34a, 34b)</td>
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<td>Systems (35)</td>
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<td>Physiology of Exercise (37)</td>
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<td>Kinesiology (38)</td>
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<tr>
<td>Laws of Growth and Development (39)</td>
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#### FOURTH YEAR

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<td>High School (122)</td>
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<td>Observation (126)</td>
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<td>Coaching Methods (43a, 45a, 43c)</td>
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<td>Gymnastic Methods (44a, 44b)</td>
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<td>Gymnastic Dancing (45a, 45b, 45c)</td>
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<td>Massage (46)</td>
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<td>Elective</td>
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<td>Pageantry (47)</td>
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<td>School Gymnastics (48)</td>
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<tr>
<td>Physical Diagnosis (49)</td>
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Those who do major work in this department are expected to take part in intra-mural or inter-collegiate athletics.

The following courses only are open to students other than those in the Teachers Training Course: 15, 31, 32, 34, 41, 43, 48.

*Embryology or Comparative Anatomy may be substituted for Histology in winter quarter.*
PHYSICS

ASSISTANT PROFESSOR, ROBERT N. THOMPSON.

Those students who expect to take physics in their college course, and who have not had physics and trigonometry in high school, should take both in their freshman year. Those students who have had such preparation are advised to take Physics 11 in their freshman year. This advice should be followed by students taking their pre-medical or pre-engineering course.

Those who do major work in this department should take calculus and general chemistry not later than their sophomore year and differential equations in their junior year where possible. The minimum requirements is 45 credits in physics and an additional 15 credit hours in physics, astronomy, chemistry or mathematics.

For Undergraduates

1. Elementary Physics. 2 Q. 10 cr. Deposit $1 a quarter. This course is intended for students who have not had a high school course Mr. Thompson.

2. Household Physics. 1 Q. Autumn. 4 cr. A briefer and modified course in elementary physics for students in Home Economics. Emphasis on mechanics, heat, and electricity, as exemplified in and applicable to the modern household. Mr. Thompson.

11a. Mechanics, Molecular Physics and Heat. 1 Q. Autumn. 5 cr. Prerequisite. Trigonometry and Physics 1 or equivalent. Deposit $1. Fee $2. A first course in college physics. It comprises about twenty-five fundamental and representative problems in these fields, which experimentally, will yield quantitative results at the hands of the average college student. Mr. Thompson.

11b. Electricity, Sound and Light. 1 Q. Winter. 5 cr. Prerequisite, Physics 11a. Deposit $1. Fee $2. This is a continuation of Physics 11a, and with it constitutes an introduction to the experimental methods of college physics. Mr. Thompson.

11c. General Physics. 1 Q. Spring. 5 cr. Prerequisite, Physics 11b. A lecture-demonstration course. In addition to unifying the subject of college physics, it takes up and amplifies those topics that it has been found inadvisable to introduce into the two previous courses. It thus rounds out and completes the introductory survey of college physics. Mr. Thompson.


22. **Sound.** 1 Q. Spring. 5 cr. Prerequisite, Physics 21 and Differential Equations. Introductory to the mathematical theory of sound. The treatment will follow in the main that given in Lamb's Dynamical Theory of Sound. Mr. Thompson.

45. **Discharge of Electricity Through Gases.** 1 Q. Autumn. 3 cr. Prerequisite, Physics 11c, Calculus. An introductory course. It will include discussion of ionization, recombination of ions, specific velocity, ionic charge, atomic constitution, vacuum tube discharge, electronic constants, electromagnetic mass, etc. Not given 1920-21. Mr. Thompson.

Students having only Physics 11b may register for 2 credits only.


41-43. **Senior Laboratory.** 3 Q. Autumn; winter, spring. 2 to 5 cr. A continuation of course 33 with emphasis on light and electricity. Mr. Thompson.
