

# OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

VOLUME 1

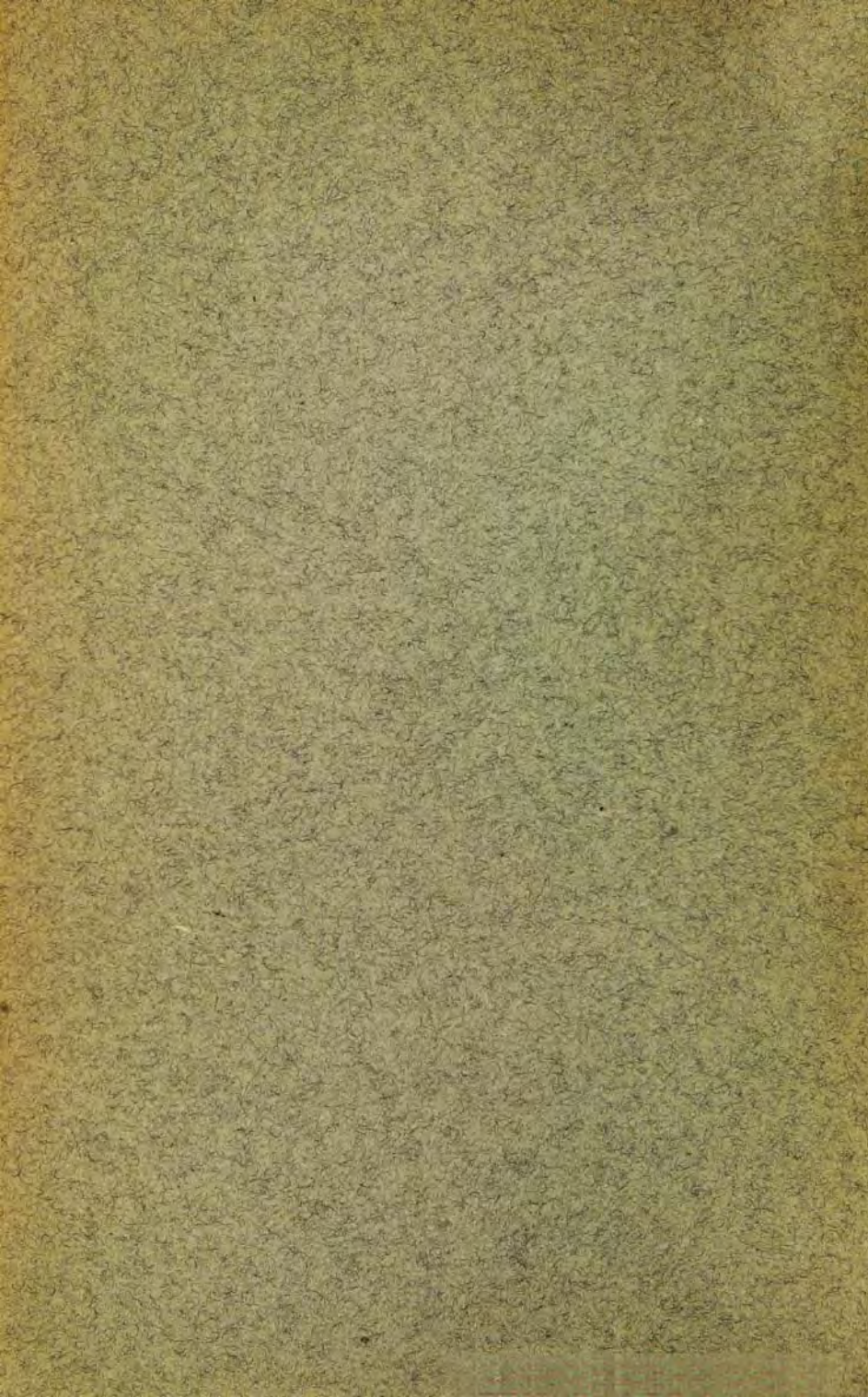
NUMBER A

## COLLEGE OF ARTS AND SCIENCES COURSES OF INSTRUCTION 1910-1911

ITHACA, NEW YORK

MAY, 1910





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## STUDY CARDS

must be filed at the office of the Dean, 143 Goldwin Smith Hall, not later than 5 p.m. on the following days

- For first term, 1910-11,  
sophomores, juniors, and seniors, Tuesday, May 31, 1910,  
freshmen and other new students, Monday, October 3, 1910.
- For second term, 1910-11,  
all students, Thursday, January 12, 1911.

Underclassmen in filling out their study cards should conform to paragraph eight, upperclassmen to paragraph nine, of the Requirements for the Degree of Bachelor of Arts, printed on pages i-iii; and freshmen should observe the list of courses open to them, as there printed. The original card of each upperclassman must bear the endorsement of his group adviser.

No student in the College will be recognized by any department as a member of any of its classes until his registration has been made at the Dean's office.





# REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

## TERMS AND HOURS

1. The requirements for the degree of Bachelor of Arts are residence for eight terms\*, and in addition to the prescribed work in the Departments of Physical Culture and Military Science and Tactics, the completion of one hundred and twenty hours of work under the rules governing the choice of studies.

2. In case a student has received surplus entrance credit, there will be deducted from the one hundred and twenty hours required for graduation, so many hours as the amount of his surplus entrance credit may warrant, and a student of whom not more than one hundred and eight hours are thus required for graduation will be considered as having completed one term of residence.

3. A student who has satisfied the entrance requirements of this College, and has afterwards completed in two or more summer sessions of Cornell University at least twelve hours of work in courses approved by the departments concerned, may be regarded as having thus satisfied one term of residence. Under no circumstances shall work done in summer sessions be accepted as the equivalent of more than one term. Subject to the same restrictions as apply to courses pursued in the Cornell Summer Session, courses pursued in summer schools elsewhere, by a student regularly registered in this College or in a college of like standing, may be credited towards his A.B. degree, if recommended by the appropriate department of this College, and if the institution where such summer courses were pursued shall certify that those courses, if pursued by a student regularly registered there, would be credited towards the corresponding degree in that college.

4. A student admitted to the College of Arts and Sciences from another college of Cornell University or from any other institution of collegiate rank shall be regarded as having completed the number of terms and of hours to which his records entitle him, and will receive all the privileges of students who have completed the same number of terms and hours by residence in the College. In order, however, to obtain the degree of Bachelor of Arts he must have been in residence at least two terms in the College of Arts and Sciences, and in that College only.

5. A student must register for at least twelve hours each term. A student registering for the first time may register and receive credit for a maximum of eighteen hours for the term. A student whose marks average 85 or more in any term may register and receive credit for a maximum of twenty hours for the following term. A student whose marks average between 85 and 65 in any term may register and receive credit for a maximum of eighteen hours for the following term. A student whose marks average 65 or less in any term may register and receive credit for a maximum of sixteen hours for the following term.

6. Students desiring to elect courses outside the College of Arts and Sciences must first obtain the approval of the Faculty. But any student who, while registered in the College of Arts and Sciences only, is per-

\*The academic year is divided into two terms.

mitted to pursue a course or courses in another College, shall have the number of hours that he may take in any other college under the provisions of paragraph 7 correspondingly reduced, and under no circumstances will he be allowed to take more than thirty hours under the provisions of this paragraph.

7. A student who has satisfied at least six terms of residence, no one of them under the provisions of paragraph 2 or 3, and who has a credit of at least ninety hours, may, with the permission of the faculties concerned, be registered both in the College of Arts and Sciences and also in any other college of Cornell University.

#### CHOICE OF STUDIES

8. Students registering in the College of Arts and Sciences for the first time must hand in their study-cards with list of courses for the term at the Dean's office on or before the third day of instruction.

9. Two weeks before the end of each term students must hand in their study-cards with list of courses for the next term at the Dean's office.

10. Students may make changes in their list of courses only during the first ten days of instruction and with the approval of the Dean. Students required by paragraph 5 to reduce their registration must during the first ten days of instruction notify the Dean which course they wish to discontinue.

11. After the first ten days of the term no student shall have the right to withdraw from any course in which he is registered, unless he shall previously obtain the authorization of the Dean to withdraw from the course on the ground of ill-health or for other reason beyond the student's control.

12. Before a student may be registered as a junior he must have completed sixty hours of work which shall include in English and history six hours, in one or more languages other than English six hours, in philosophy and mathematics six hours, and in science (physics, chemistry, geology, physical geography, and the biologic sciences) six hours, of which hours the student is required to take at least twelve, and advised to take more, in his freshman year. Each six hours may be entirely in one division (for example, philosophy six hours), or partly in one and partly in another (for example, philosophy three hours and mathematics three hours). Surplus entrance credit may not be applied in satisfaction of any of these required groups of six hours.

13. Each student shall choose at the beginning of his junior year one of the following groups :

- |                                   |  |
|-----------------------------------|--|
| 1. Ancient Languages.             | 7. Physics.                                |
| 2. Modern Languages.              | 8. Chemistry.                              |
| 3. English and Oratory.           | 9. Botany.                                 |
| 4. Philosophy and Education       | 10. Zoology and Entomology.                |
| 5. History and Political Science. | 11. Physiology, Histology, and Embryology. |
| 6. Mathematics and Astronomy.     | 12. Geology and Physical Geography.        |

In the group thus chosen he must complete during his junior and senior years at least twenty hours of work. In selecting these twenty hours the student must obtain the advice and approval of some one professor or assistant professor within the group, who shall be chosen by the student himself. But a senior in this college who is registered also in some other college of Cornell University is excused from ten of the twenty hours.



(For the present, however, a student specializing in chemistry and taking the four years' course outlined by the Department of Chemistry may be exempted from paragraph 12 of the above requirements.)

A student intending to follow the five year course leading to the degree of C.E., of which an outline will be given under the College of Civil Engineering, or that leading to the degree of M.E., of which an outline will be given under Sibley College, should register in his freshman and sophomore years, and may receive credit, for all courses specified in the outline which he elects to follow ; but he may not register or receive credit, during those years, for any other courses in mathematics, physics, or chemistry, or any other courses outside the College of Arts and Sciences, than those there specified ; nor may he register, during his freshman or sophomore year, for any course in the College of Arts and Sciences which is specified for a later year of the outline which he is following. A student following the special course in chemistry, of which an outline is given under the Department of Chemistry on page 48, may register, in each term, and may receive credit, for the courses outside the College which are specified in that outline.)

#### COURSES OPEN TO FRESHMEN WITHOUT SPECIAL PERMISSION OF THE ADMINISTRATIVE BOARD IN CHARGE OF FRESHMEN AND SOPHOMORES

Greek, 1, 3, 5, 6 ; Latin, 1, 3, 4 ; Germanic Languages, 1, 2, 3, 4, 5, 6, 7, 8 ; Romance Languages, 1, 2, 3, 12, 30, 32, 40, 42 ; English, 1 ; Music 1 ; History, 1, 21 ; Bibliography, 1, 1a ; Mathematics, 1, 2a, 2b, 3, 4, 6, 7 ; Physics, 1, 5, 6, 10 ; Chemistry, 1, 6, 7 ; General Biology, 1 ; Botany, 1, 2 ; Entomology, etc., 2, 4, 5 ; Vertebrate Zoology and Neurology, 2, 5 ; Geology, 1, 2a, 2b, 2c.

#### THESES

Any senior in the College of Arts and Sciences may arrange with the department in which he is taking his principal work to write a thesis, which must be a scholarly dissertation on some subject coming within the province of that department, and which, if accepted, shall entitle him to not more than three hours of credit a term, in the discretion of the department. The subject must receive the written approval of the professor in charge of the study to which it relates, and a memorandum of such approval and of the title of the thesis must be left with the Registrar not later than the fifteenth day of October. A bound copy of the thesis, type-written on one side of paper 8x10½ inches in size, and double-spaced, must be deposited with the Registrar, for presentation to the Faculty, not later than the fifteenth day of May. The copy thus presented shall become the property of the University.

#### VOCATIONAL COURSES

Students preparing themselves to be teachers should follow the directions given by the School of Education on page 27.

Students who intend to follow chemistry as a profession, either by teaching it or by entering commercial practice, should pursue the special course in chemistry outlined on page 48.

Students preparing for other vocations, such as journalism, banking, business, philanthropy, or the various forms of civil service, are advised to plan their studies with the assistance of the professors most intimately concerned.





# COURSES OF INSTRUCTION

## SEMITIC LANGUAGES AND LITERATURES

1. HEBREW. Throughout the year, credit three hours a term. Professor SCHMIDT. M W Th, 2, Goldwin Smith 127.

Grammar (Harper, Gesenius—Kautzsch). Genesis. Ruth and Esther at sight. Exercises in composition. Open only to juniors, seniors, and graduates.

[2a. ARABIC. Credit two hours a term. Professor SCHMIDT.

Grammar (Socin, Wright, Caspari—Müller). Selections from prose writers, poets, and the Qurân.]

Not given in 1910-11.

2b. ADVANCED ARABIC. Throughout the year, credit two hours a term. Prerequisite course 2a. Professor SCHMIDT. T Th, 9, Goldwin Smith 127.

Grammar (Wright—DeGoeje). A group of early suras in the Qurân. Selections from the Prolegomena of Ibn Khaldun.

Primarily for graduates.

3. ETHIOPIC. Throughout the year, credit two hours a term. Prerequisite courses 1, 2. Professor SCHMIDT. T Th, 3, Goldwin Smith 127.

Grammar (Dillmann—Bezold). Liber Baruch in Dillmann's *Chrestomathia Aethiopica*, and The Book of Enoch, xxxvii-lxxi (ed. Charles). Study of Ethiopic manuscripts. Open only to students who have had Arabic.

Primarily for graduates.

[4a. ASSYRIAN. Throughout the year, credit two hours a term. Prerequisite courses 1, 2. Professor SCHMIDT.

Grammar (Lyon, Delitzsch). Selections from Meissner's *Chrestomatie*, Delitzsch's *Lesestücke*, and Rawlinson's *Cuneiform Inscriptions of Western Asia*. Open only to graduates.]

Not given in 1910-11.

4b. ARAMAIC. Throughout the year, credit two hours a term. Professor SCHMIDT. T Th, 4, Goldwin Smith 127.

Grammar (Nestle, Nöldeke, Duval). The Gospel of Matthew in the Sinaitic Syriac, the Curetonian Fragments, the Peshita, and the *Evangeliarium Hierosolymitanum*. Inscriptions in the *Corpus Inscriptionum Semiticarum*, and the Elephantine Papyri.

5a. EGYPTIAN. Throughout the year, credit two hours a term. Prerequisite courses 1, 2. Professor SCHMIDT. W, 4-6, Goldwin Smith 127.

Grammar (Erman). Hieroglyphic texts. Study of squeezes in the Eisenlohr collection.

Primarily for graduates.

[5b. COPTIC. Throughout the year, credit two hours a term. Prerequisite course 5a. Professor SCHMIDT.

Grammar (Steindorff). Selections from the Gospels and from *Pistis Sophia*]. Primarily for graduates.

Not given in 1910-11.

6. SEMITIC LITERATURE. Throughout the year, credit two hours a term. Professor SCHMIDT. M W, 3, Goldwin Smith 120.

General introduction to the Bible, including Apocrypha and Pseudepigrapha, and special introduction to each book. Designed to give in brief

compass the results of scientific inquiry concerning the origin, date, composition, and character of the Jewish and Christian Scriptures. Preparation of papers, discussion of special topics, and examinations. Open to juniors, seniors, and graduates. No knowledge is required of Semitic languages or of Greek.

7. SEMITIC SEMINARY. Throughout the year, credit two hours a term. Prerequisite courses 2a, 2b. Professor SCHMIDT. M, 4-6, Goldwin Smith 127.

Study of Arabic inscriptions in Berchem's *Corpus Inscriptionum Arabicarum*, or Exodus in the Hebrew text and the ancient versions.

8. COMPARATIVE SEMITIC PHILOLOGY. Throughout the year, credit one hour a term. Prerequisite courses 1, 2, 4b. Professor SCHMIDT. F, 3, Goldwin Smith 127.

Study of certain morphological and syntactical peculiarities of the Aramaic dialects. Interpretation, for purposes of comparison, of texts in Mandæic, Babylonian Talmudic, ancient and modern Syriac, Galilaean, Samaritan and Judæan Aramaic, Palmyrene, and Nabataean.

For graduates.

[9a. ORIENTAL HISTORY. Throughout the year, credit two hours a term. Professor SCHMIDT.

Introduction to the history of Asia. Designed like course 9b, to acquaint the student in a general way with the civilizations of the Orient; sources, methods of study, and present problems; the great epochs, the leading personalities, and the chief institutions. The history of Asia Minor, Syria, Arabia, Irak, Iran, India, China, Japan, Central Asia, and Asiatic Russia will be presented in outline. The illustrative material of the department will be used. Preparation of papers, and frequent examinations.]

Not given in 1910-11.

9b. ORIENTAL HISTORY. Throughout the year, credit two hours a term. Professor SCHMIDT. T Th, 10, Goldwin Smith 127.

Introduction to the history of Africa. This course, like the one given in alternate years on Asia, is designed to acquaint the student in a general way with the civilization of the Orient; sources, methods of study, and present problems; the great epochs, the leading personalities, and the chief institutions. The history of Egypt, Libya and the Cyrenaica, Carthage, Mauretania, Nubia, Ethiopia, and the various Egyptian and Maghrebite caliphates in outline, and the growth of European influence in Modern Africa. The illustrative material of the department will be used. Preparation of papers, and frequent examinations.

Open to juniors, seniors, and graduates.

## GREEK

1. ELEMENTARY GREEK. The essentials of the grammar; simple exercises in composition; reading of Xenophon's *Anabasis*, books I-IV. Throughout the year, credit twelve hours for the year. Assistant Professor JONES. M T W Th F S, 9, Goldwin Smith 134.

This course is designed for and may be elected by all students that wish to acquire, by extraordinary effort in one year, the ability to read Attic prose. This course is continuous through the year. No credit will be allowed for the first term alone.

3. XENOPHON'S *HELLENICA*, HOMER'S *ODYSSEY*. Throughout the year, credit three hours a term. Prerequisite course 1. Assistant Professor JONES. M W F, 10, Goldwin Smith 134.

Open to freshmen who have presented Greek at entrance and to those who have passed in course 1.



5. **LYSIAS.** First term, credit two hours. Open to those who have taken or are taking course 3, with which it affords an opportunity for freshmen to take five hours of Greek. Assistant Professor JONES. T Th, 10, Goldwin Smith 134.

Selected speeches of Lysias illustrative of normal Attic prose and of the simple style in oratory.

6. **HERODOTUS.** Second term, credit two hours. Open to those who have taken or are taking course 3, with which it affords an opportunity for freshmen to take five hours of Greek. Professor BRISTOL. T Th, 10, Goldwin Smith 134.

The story of the Persian Wars will be read.

7. **GREEK COMPOSITION.** Throughout the year, credit one hour a term. Prerequisite course 3. Assistant Professor JONES. S, 11, Goldwin Smith 137.

This course is based on a systematic and practical study of Greek grammar, and leads to course 35.

10. **EURIPIDES, THE IPHIGENIA IN TAURIS AND THE MEDEA.** First term, credit three hours. Prerequisite course 3 or the equivalent. Professor STERRETT. M W F, 11, Goldwin Smith 134.

11. **SOPHOCLES, THE OEDIPUS TYRANNUS AND THE ANTIGONE.** Second term, credit three hours. Prerequisite courses 3 and 10 or the equivalent. Professor STERRETT. M W F, 11, Goldwin Smith 134.

15. **ILIAD, selections (about nine books).** First term, credit two hours. Prerequisite courses 3, 10, 11. Professor STERRETT. T Th, 12, Goldwin Smith 134.

16. **PLATO, REPUBLIC, OR DEMOSTHENES, ORATION ON THE CROWN.** Second term, credit two hours. Prerequisite courses 3, 10, 11. Professor STERRETT. T Th, 11, Goldwin Smith 134.

20. **THEOCRITUS, BION, AND MOSCHUS.** First term, credit two hours. Professor STERRETT. T Th, 9, Goldwin Smith 134.

Open to seniors and graduates.

21. **ARISTOPHANES, THE BIRDS AND THE CLOUDS.** Second term, credit two hours. Professor STERRETT. T Th, 9, Goldwin Smith 137.

Open to seniors and graduates.

24. **PAUSANIAS.** Throughout the year, credit two hours a term. Mr. ANDREWS. Hours to be arranged after consultation, Goldwin Smith 35.

A reading course in the sources of knowledge of Greek topography with special reference to Athens, supplemented by illustrated lectures and by readings from Thucydides and Herodotus.

26. **NEW TESTAMENT GREEK, St. Luke's Gospel and the Acts of the Apostles, (Westcott & Hort's edition).** Throughout the year, credit two hours a term. Dr. WHITE. W F, 8, Barnes Hall Library.

28. **MODERN GREEK.** Throughout the year, credit two hours a term. Mr. ANDREWS. Days and hours to be arranged after consultation. Goldwin Smith 35.

The literary language and the colloquial idiom. Athenian newspapers and novels in the vernacular will be read.

30. **GREEK EPIGRAPHY.** Throughout the year, credit two hours a term. Mr. ANDREWS. Days and hours to be arranged after consultation, Goldwin Smith 35.

A study of Greek alphabets and inscriptions, chiefly from the large collection of squeezes owned by the department.

For graduates and qualified undergraduates.

[33. GREEK LIFE. Throughout the year, credit two hours a term. Professor STERRETT.

The land and the people; home life and private antiquities; public life and social institutions. A study of the private life of the Greeks with illustrations by lantern views, photographs, etc., from ancient monuments and remains.]

Not given in 1910-11.

35. ADVANCED GREEK COMPOSITION. Throughout the year, credit one hour a term. Assistant Professor JONES. S, 12, Goldwin Smith 137.

Open by special permission to properly qualified students.

40. THE TRAGEDIES OF SOPHOCLES. Special attention is given to the rhythmical and metrical structure and to the practical reading of the choral odes. Lectures on the antiquities of the stage. W F, 12, Professor STERRETT.

This course is devoted to the study of the entire works of some one author or of a particular field of literature, and will be varied from year to year. Exclusively for graduates.

43. THE AGAMEMNON OF AESCHYLUS. First term. T Th, 11. Professor STERRETT. Textual criticism and literary interpretation.

Exclusively for graduates.

44. PINDAR. The Olympian and Pythian Odes. Second term. T Th, 11. Professor STERRETT. The fluent rhythmical reading of the odes is insisted upon.

Exclusively for graduates.

50. GREEK SEMINARY. Homeric questions from the archaeological point of view. Papers and discussions. W, 2-4. Professor STERRETT.

Exclusively for graduates.

## GREEK ART AND ANTIQUITIES

The courses in this department do not require any knowledge of Greek or Latin and are open to all students except freshmen.

1. HISTORY OF GREEK SCULPTURE. First term, credit three hours. Mr. ANDREWS. M W F, 9, Goldwin Smith Museum.

Lectures in the Museum of Casts. Intended to be supplemented by course 4 but may be taken separately.

2. HISTORY OF GREEK SCULPTURE. Throughout the year, credit two hours a term. Mr. ANDREWS. T Th, 10, Goldwin Smith Museum.

Lectures in the Museum of Casts.

3. HISTORY OF GREEK SCULPTURE. Throughout the year, credit three hours a term. Mr. ANDREWS. M W F, 11, Goldwin Smith Museum.

Lectures in the Museum of Casts.

4. GREEK ARCHAEOLOGY. Second term, credit three hours. Mr. ANDREWS. M W F, 9, Goldwin Smith 35.

Lectures on pre-Greek art and civilization, Greek architecture, terra-cottas, coins, bronzes, gems, and vases. The terra-cottas, coins, and vases in the Museum of Casts will be used as material for study. Intended to be taken with course 1, but may be taken separately.

5. GREEK ARCHAEOLOGY. Throughout the year, credit two hours a term. Mr. ANDREWS. M W, 10, Goldwin Smith 35.

Similar to course 4.



## GENERAL PHILOLOGY

[1. INTRODUCTION TO THE STUDY OF LANGUAGE. First term, credit three hours. Professor BRISTOL.

Language as speech; the elements of phonetics; the analysis of sounds in English, Greek, and Latin; the life and growth of language; changes in form and meaning, the languages of the Indo-European family; their classification and relations to one another, with special reference to Greek, Latin, German, and English; the origin and early history of the alphabet. Outline history of linguistic science and of the comparative method in language study.

Designed for students of either ancient or modern languages who wish to know something of the general principles of the science of language and of the history of that science; further for students of history who may be interested in questions on the border line of history and linguistics. Open to graduates and to properly qualified seniors].

Not given in 1910-11.

During the second term of 1910-11, Professor Bristol will be ready to assist students who wish to study questions dealing with the use of linguistic evidence in the determination of questions of race and culture, and of problems of prehistory in Europe. The reading of Tacitus' *Germania* will be made the centre for this study.

## LATIN

1. LIVY; CICERO, DE SENECTUTE; HORACE, ODES AND EPODES; LATIN WRITING. Throughout the year, credit three hours a term.

Sec. 1, M W F, 9, Goldwin Smith 124. Professor ELMER.

Sec. 2, M W F, 11, Goldwin Smith 128. Professor DURHAM.

Sec. 3, M W F, 12, Goldwin Smith 128. Professor DURHAM.

[2. SIGHT TRANSLATION: GELLIUS, SELECTIONS; OVID, METAMORPHOSES. Throughout the year, credit one hour a term.]

Not given in 1910-11.

3. SIGHT TRANSLATION: CAESAR'S CIVIL WAR; PHAEDRUS; MARTIAL. Throughout the year, credit one hour a term.

Sec. 1, T, 11, Goldwin Smith 124. Professor ELMER.

Sec. 2, S, 10, Goldwin Smith 124. Professor ELMER.

Especially recommended as collateral work for those who are taking course 1, but open to all students.

Courses 2 and 3 are given in alternate years.

4. VIRGIL'S AENEID, BOOKS I-VI. Second term, credit three hours. Professor ELMER. T Th S, 12, Goldwin Smith 124.

7. LATIN CONVERSATION AND ORAL COMPOSITION. Throughout the year, credit one hour a term. Professor DURHAM. M, 2, Goldwin Smith 128.

Open to students in the second year of their Latin work.

8. TERENCE, PHORMIO AND ADELPHI; HORACE, SATIRES AND EPIS-  
TLES; TACITUS, GERMANIA AND AGRICOLA; LATIN WRITING. Through-  
out the year, credit three hours a term. Prerequisite course 1. Professor  
BENNETT. M W F, 9, Goldwin Smith 120.

Courses 8 and 10 are given in alternate years.

[9. SIGHT TRANSLATION FOR SOPHOMORES. Throughout the year, credit one hour a term. Professor DURHAM.

Open to students in the second year of their Latin work.]

Not given in 1910-11.

[10. CATULLUS; VIRGIL'S GEORGICS; OVID'S AMORES; MARTIAL; LATIN WRITING. Throughout the year, credit three hours a term. Prerequisite course 1. Professor DURHAM.] Not given in 1910-11.

Courses 8 and 10 are given in alternate years.

11. SELECTIONS FROM CICERO'S LETTERS; CICERO, DE ORATORE, BOOK I. Throughout the year, credit two hours a term. Prerequisite course 1. Professor ELMER. W F, 11, Goldwin Smith 124.

[12. SELECTIONS FROM CICERO'S DE OFFICIIS; CICERO'S SECOND PHILIPPIC. Throughout the year, credit two hours a term. Prerequisite course 1. Professor ELMER.]

Courses 11 and 12 are given in alternate years.

Not given in 1910-11.

16. SELECTIONS FROM THE REPUBLICAN LITERATURE: PLAUTUS, THE CAPTIVES AND MOSTELLARIA; LUCRETIVS; LECTURES ON THE HISTORY OF ROMAN LITERATURE. Throughout the year, credit three hours a term. Prerequisite course 8, 10, 11, or 12. Professor BENNETT. T Th S, 5, Goldwin Smith 120.

[17. LITERATURE AND HISTORY OF THE EARLY EMPIRE: SUETONIUS, LIVES OF THE CAESARS; PLINY'S LETTERS, TACITUS' ANNALS. Throughout the year. Prerequisite course 8, 10, 11, or 12. Professor BENNETT.]

Courses 16 and 17 are given in alternate years.

Not given in 1910-11.

21. INTERMEDIATE COURSE IN LATIN WRITING. Throughout the year, credit one hour a term. Prerequisite course 8, 10, 11, or 12. Professor ELMER. M, 11, Goldwin Smith 124.

26. TEACHERS TRAINING COURSE. Throughout the year, credit three hours a term. Open, upon personal application to the professor, to students who have had course 8, 10, 11, or 12, and have taken or are taking course 16 or 17. Professor BENNETT. M W F, 12, Goldwin Smith 120.

Study of the evidences for the pronunciation of Latin; hidden quantities; peculiarities of orthography; theoretical consideration of Latin syntax; lectures on problems connected with the teaching of Latin in secondary schools. Special study of some Latin author read in the schools, with reference to all the points that should be emphasized in elementary instruction.

[27. ROMAN ANTIQUITIES. Throughout the year, credit two hours a term. Open to students of the sophomore, junior, and senior years. Professor BENNETT.

First term and until Easter recess: topography and architectural remains of the city of Rome. A systematic consideration of the constitution of the Roman family, status of women, marriage, children, education, slavery, the Roman house and its furniture, food, dress, baths, games and amusements, books, trade, travel, religion, death, burial, etc. Lectures illustrated by lantern views, photographs, and material in the Museum of Casts. Easter recess until end of second term: the political and legal antiquities of the Romans].

Not given in 1910-11.

34. CICERO, IN VERREM, FOURTH ORATION OF THE ACTIO SECUNDA. Throughout the year, credit one hour a term. Prerequisite course 8, 10, 11, or 12, or the equivalent. Professor ELMER, Th, 11, Goldwin Smith 124.

This course requires no prepared translation for the class-room work. The professor in charge will himself translate the work with full comments on subject-matter, style, difficulties, etc. The members of the class will endeavor merely to read the original Latin as Cicero himself would have read it. Designed to develop in students the ability to understand and to appreciate the Latin without translating.



[35. VIRGIL, AENEID VII-XII. Throughout the year, credit one hour a term. Prerequisite course 8, 10, 11, or 12, or the equivalent. Professor ELMER. This course alternates with 34 and has a similar aim].

Not given in 1910-11.

41. LATIN SEMINARY. Throughout the year. Professor BENNETT. T, 2, and S, 10. Library, Greek and Latin Seminary Room.

The work of the seminary for 1910-11 will consist of the textual and exegetical study of Horace, combined with a reading of all of Horace's works.

The object of the seminary is to familiarize its members with the methods and habits of independent investigation. The work therefore, as far as possible, is thrown into the hands of the students themselves.

Exclusively for graduates.

42. HISTORY, AIM, AND SCOPE OF LATIN STUDIES. Throughout the year. Professor BENNETT. W, 11, Goldwin Smith 120.

This course will present the history of Latin study since the Renaissance, will outline the various fields of investigation, stating the present state of knowledge in each, along with the chief problems still awaiting solution, and will give a very full bibliography.

Exclusively for graduates.

[43. HISTORICAL LATIN SYNTAX. Throughout the year. Professor BENNETT.

Lectures on the moods and tenses of the Latin verb, with special reference to the subjunctive,—its primitive meaning and its development in subordinate clauses.

Exclusively for graduates.]

Not given in 1910-11.

44. HISTORICAL GRAMMAR OF THE LATIN LANGUAGE. Throughout the year. Professor BENNETT. T Th, 10-11:15. Goldwin Smith 120.

Lectures and exercises on the sounds and inflections of the Latin language from the historical point of view.

Exclusively for graduates.

45. LATIN WRITING, ADVANCED COURSE. Throughout the year. Professor ELMER. T, 11, Goldwin Smith 124.

Exclusively for graduates.

[46. HISTORY AND DEVELOPMENT OF ROMAN EPIC POETRY. Throughout the year. Professor ELMER.

Exclusively for graduates.]

Not given in 1910-11.

47. VULGAR LATIN. First term, credit three hours. Open to graduates and to qualified undergraduates. Professor DURHAM. Goldwin Smith 128.

A study of the extension of the Latin language to the Roman provinces, and an investigation of the phonology, the flexions, and the syntax of vulgar Latin. Consentius, de metaplasms et barbarismis, Silviae vel potius Aetheriae peregrinatio ad loca sancta (ed. Heraeus). A reading knowledge of French and German is required.

48. TACITUS, AGRICOLA. Second term, credit two hours. Open to graduates and qualified undergraduates. Professor DURHAM. Goldwin Smith 128.

A literary and historical study. A reading knowledge of French and German is required.

49. ENNIUS, FRAGMENTS OF THE ANNALES. Second term, credit one hour. Open to graduates and qualified undergraduates. Professor DURHAM. Goldwin Smith 128.

[50. LATIN EPIGRAPHY. Throughout the year, credit two hours a term. Open to graduates and qualified undergraduates. Professor DURHAM.

The interpretation of selected inscriptions. Special topics in the administrative history of the Roman Empire will be assigned for investigation. A reading knowledge of French and German is required.]

Not given in 1910-11.

[51. *CARMINA LATINA EPIGRAPHICA* (Ed. Bücheler). Credit one hour a term. Professor DURHAM.]

Not given in 1910-11.

ROMAN HISTORY.

See Ancient History.

LATIN PALEOGRAPHY.

See History, course 43.

## GERMAN

Course 1 is for beginners in German, and for those who have not already passed the entrance examination in elementary German.

Course 2 is open to those who have had the equivalent of course 1, or those who have passed the entrance examination in elementary German. Course 2 cannot be taken for credit by those who have entrance credit in advanced German.

Courses 1-8 are open to freshmen; of these, courses 1, 2, 3, 4, 6, and 8 may be begun in the second term.

1. **ELEMENTARY GERMAN.** Repeated in second term, credit six hours a term.

First term.

Sec. 1, daily, 9, Goldwin Smith 183. Assistant Professor POPE.

Sec. 2, daily, 11, Goldwin Smith 177. Mr. ZINNECKER.

Second term.

Sec. 1, daily, 10, Goldwin Smith 177. Mr. ZINNECKER.

Sec. 2, daily, 11, Goldwin Smith 177. Dr. ANDREWS.

Textbooks: Vos's Essentials of German; Hewett's German Reader. If taken in the first term, this course may be followed by German 2 in the second term.

2. **SECOND GERMAN COURSE.** Repeated in second term, credit five hours a term. Prerequisite course 1.

First term.

Sec. 1, M T W Th F, 9, Goldwin Smith 177. Mr. ZINNECKER.

Sec. 2, M T W Th F, 10, Goldwin Smith 177. Dr. ANDREWS.

Sec. 3, M T W Th F, 11, Goldwin Smith 225. Dr. ANDREWS.

Second term.

Sec. 1, M T W Th F, 8, Goldwin Smith 183. Dr. ANDREWS.

Sec. 2, M T W Th F, 9, Goldwin Smith 183. Assistant Professor BOESCHE.

Sec. 3, M T W Th F, 11, Goldwin Smith 225. Mr. ZINNECKER.

Textbooks: Thomas's Practical German Grammar; Schiller's Wilhelm Tell; Lessing's Minna von Barnhelm; Sudermann's Frau Sorge. Courses 1 and 2 together, are the equivalent of the entrance requirements, elementary and advanced, in German.

3. **ELEMENTARY GERMAN COMPOSITION AND CONVERSATION.** Throughout the year, credit three hours a term. Open to those who are taking or have taken course 2.

Sec. 1, M W F, 12, Goldwin Smith 190. Assistant Professor FLUEGEL.

Sec. 2, T Th S, 12, Goldwin Smith 183. Assistant Professor FLUEGEL.

Sec. 3, T Th S, 12, Goldwin Smith 190. Assistant Professor BOESCHE, (first term); Assistant Professor POPE, (second term).

Textbooks: Thomas's Practical German Grammar; Pope's German Com.



position. Illustrative maps, charts, and pictures. Exercises conducted in German. It is advisable to combine course 3 with another German course, e. g., courses 5-6, or 7-8.

4. **ADVANCED GERMAN COMPOSITION AND CONVERSATION.** Throughout the year, credit three hours a term. Prerequisite courses 1, 2, and two terms of 3, or the equivalent.

Sec. 1, M W F, 10, Goldwin Smith 183. Assistant Professor DAVIDSEN.

Sec. 2, T Th S, 10, Goldwin Smith 183. Assistant Professor DAVIDSEN.

Sec. 3, M W F, 12, Goldwin Smith 183. Assistant Professor BOESCHE.

Exercises conducted entirely in German. Theme-writing. This course is essential for the pursuit of advanced work in the department, and must be completed by students that desire to be recommended as teachers of German.

5. **INTERMEDIATE GERMAN COURSE.** First term, credit three hours. Prerequisite courses 1 and 2, or the equivalent.

Sec. 1, M W F, 10, Goldwin Smith 190. Professor FAUST.

Sec. 2, M W F, 10, Goldwin Smith 227. Assistant Professor FLUEGEL.

Sec. 3, T Th S, 10, Goldwin Smith 190. Assistant Professor BOESCHE.

Sec. 4, T Th S, 10, Goldwin Smith 225. Mr. ZINNECKER.

German grammar treated topically. The German language will be used as far as practicable. Texts: Heine's *Prose* (Macmillan Co.), Schiller's historical essays: *Die Belagerung von Antwerpen*, and *Des Grafen Egmont Leben und Tod*.

6. **INTERMEDIATE GERMAN COURSE.** Second term, credit three hours. Prerequisite courses 1 and 2, or the equivalent.

Sec. 1, M W F, 10, Goldwin Smith 190. Assistant Professor POPE.

Sec. 2, M W F, 10, Goldwin Smith 227. Assistant Professor FLUEGEL.

Sec. 3, T Th S, 10, Goldwin Smith 190. Assistant Professor BOESCHE.

Sec. 4, T Th S, 10, Goldwin Smith 225. Professor FAUST.

Continuation of course 5. Texts: Meyer's *Der Heilige*; Scheffel's *Der Trompeter von Säkkingen*.

7. **READING COURSE.** First term, credit two hours. Prerequisite courses 1-3, 5, and 6, or the equivalent. Assistant Professor FLUEGEL. T Th, 11, Goldwin Smith 183.

The interpretation of difficult literary prose. Text: Nichols's *Modern German Prose*.

8. **RAPID READING COURSE.** Second term, credit two hours. Prerequisite courses 1-3, 5, and 6, or the equivalent. Assistant Professor FLUEGEL. T Th, 11, Goldwin Smith 183.

A large number of texts of ordinary difficulty selected from the works of modern German authors will be read and discussed in German.

9. **SCHILLER'S LIFE AND EARLY DRAMAS:** *Die Räuber*; *Kabale und Liebe*; *Don Karlos*. First term, credit three hours. Prerequisite courses 1-3, 5, and 6, or the equivalent. Professor FAUST. M W F, 9, Goldwin Smith 190.

10. **SCHILLER: WALLENSTEIN** (three parts); *Geschichte des dreissig-jährigen Kriegs*. Second term, credit three hours. Prerequisite courses 1-3, 5, and 6, or the equivalent. Professor FAUST. M W F, 9, Goldwin Smith 190.

11. **GOETHE.** First term, credit three hours. Prerequisite courses 1-6, or the equivalent. Professor FAUST. T Th S, 9, Goldwin Smith 190.

Goethe's life as portrayed in his letters (edition Ernst Hartung, 2 vols.); his poems, illustrating his artistic and philosophical principles.

12. **GOETHE'S FAUST**, part I and selected portions of part II. Second term,

credit three hours. Prerequisite courses 1-6, or the equivalent. Professor FAUST. T Th S, 9, Goldwin Smith 190.

A survey of the genesis and development of the drama, an examination of its historical and legendary elements, and a study of its criticism of life.

[13. HISTORY OF GERMAN LITERATURE. First term, credit three hours. Prerequisite courses 1-3, 5, and 6, or the equivalent. Professor FAUST.

An outline lecture course beginning with the Old High German period and extending through the seventeenth century. Lectures, recitations, and collateral readings.]

Not given in 1910-11.

[14. HISTORY OF GERMAN LITERATURE. Second term, credit three hours. Prerequisite courses 1-3, 5, and 6, or the equivalent. Professor FAUST.

An outline lecture course beginning with the eighteenth century and extending to the present time. Lectures, recitations, and collateral readings.]

Not given in 1910-11.

[15. GERMAN LITERATURE IN THE NINETEENTH CENTURY, 1800-1850. First term, credit three hours. Prerequisite courses 1-6, or the equivalent. Assistant Professor DAVIDSEN.

Lectures in German and collateral readings.]

Not given in 1910-11.

[16. GERMAN LITERATURE IN THE NINETEENTH CENTURY, 1850-1900. Second term, credit three hours. Prerequisite courses 1-6, or the equivalent. Assistant Professor DAVIDSEN.

Lectures in German and collateral readings.]

Not given in 1910-11.

17. THE LITERATURE OF THE REFORMATION. First term, credit three hours. Prerequisite courses 1-6, or the equivalent. Assistant Professor DAVIDSEN. M W F, 11. Goldwin Smith 190.

Lectures in German, illustrative readings from the works of Martin Luther, Ulrich von Hutten, Hans Sachs, Thomas Murner, and Johann Fischart; also from the Volksbücher and folk-songs of the sixteenth century.

18. LESSING, HIS LIFE, WORKS, AND PERIOD. Second term, credit three hours. Prerequisite courses 1-6, or the equivalent. Assistant Professor DAVIDSEN. M W F, 11. Goldwin Smith 190.

Lectures in German and collateral readings from Lessing's dramas and prose writings.

19. THE ROMANTIC MOVEMENT IN GERMANY. First term, credit three hours. Prerequisite courses 1-3, 5, and 6, or the equivalent. Assistant Professor BOESCHE. M W F, 10, Goldwin Smith 181.

The underlying principles of the Romantic movement, its expression in literature, and influence on the national life and ideals

Readings from Novalis, Tieck, Arnim and Brentano (Des Knaben Wunderhorn), Uhland, Chamisso, Eichendorff, with introductory and connecting lectures.

20. BISMARCK, THE MAN AND HIS TIME. Second term, credit three hours. Prerequisite courses 1-3, 5, and 6, or the equivalent. Assistant Professor BOESCHE. M W F, 10, Goldwin Smith 181.

Lectures and collateral readings. Selections from Bismarck's speeches and correspondence. A study of his personality and of the forces that contributed to the making of modern Germany.

21. FRIEDRICH HEBBEL; his dramatic works and theory of the drama. First term, credit two hours. Prerequisite courses 1-6, and at least six hours advanced work in literature. Assistant Professor DAVIDSEN. T Th, 11, Goldwin Smith 190.



22. HENRIK IBSEN. Second term, credit two hours. Prerequisite courses 1-6, and at least six hours advanced work in literature. Assistant Professor DAVIDSEN. T Th, 11, Goldwin Smith 190.

A study of Ibsen's representative dramas (in the German translation), and of his influence on modern German literature.

23. RICHARD WAGNER, HIS LIFE AND WORKS. Second term, credit three hours. Prerequisite courses 1-3, 5, and 6, otherwise only by special permission. Assistant Professor POPE. T Th S, 10, Goldwin Smith 128.

Lectures on Wagner's theory of the music drama, the sources of his operas, his place in German literature, and his influence on modern culture. The texts of the principal operas will be read in class, and certain hours will be arranged for illustrative recitals.

[24. LECTURES IN GERMAN ON GERMANY AND GERMAN INSTITUTIONS. Second term, credit one hour. Assistant Professor DAVIDSEN.]

Not given in 1910-11.

25. LECTURES IN GERMAN ON GERMAN ART. Second term, credit one hour. Assistant Professor DAVIDSEN. S, 11, Goldwin Smith 190.

German churches and castles; Dürer and Holbein; German painters of the nineteenth century. The lectures will be illustrated by lantern views.

[26. THE HISTORY OF THE GERMAN ELEMENT IN THE UNITED STATES. Throughout the year, credit one hour each term. Professor FAUST.]

The characteristics of the German immigrations of the seventeenth, eighteenth, and nineteenth centuries; their arrival, location, and activities. The relative importance of the German as a formative element in the building of the nation, with special reference to political, social, and educational influences.]

Not given in 1910-11.

27. SCIENTIFIC GERMAN. First term, credit three hours. Prerequisite courses 1 and 2, or three years of German in high school. Assistant Professor FLUEGEL. M W F, 11, Goldwin Smith 183.

Wallentin, Grundzüge der Naturlehre, followed by scientific monographs selected to meet the needs of the class.

28. SCIENTIFIC GERMAN. Second term, credit three hours. Prerequisite courses 1 and 2, or three years of German in high school. Assistant Professor FLUEGEL. M W F, 11, Goldwin Smith 183.

Readings selected chiefly to meet the needs of engineers. Fluegel's Graded Technical Reader, followed by readings from Die Welt der Technik (engineering journal, organ of the Polytechnic Society of Berlin).

[29. ELEMENTARY PHONETICS AND ITS APPLICATION TO THE STUDY OF MODERN LANGUAGES. First term, credit one hour. Assistant Professor DAVIDSEN.]

Not given in 1910-11.

30. PRINCIPLES OF WORD-FORMATION. First term, credit one hour. Assistant Professor DAVIDSEN. S, 11, Goldwin Smith 190.

Composition and derivation of words and similar phenomena. A course supplementing the study of German grammar and affording a deeper insight into the structure of the German language.

[31. TOPICS IN HISTORICAL GERMAN SYNTAX. Second term, credit three hours. Assistant Professor BOESCHE.]

An examination and explanation of difficult or peculiar modern German constructions in the light of the past stages of the language and of analogous developments in other languages. Lectures and reports on assigned works of reference. This course is especially adapted to the needs of teachers.]

Not given in 1910-11.

32. **ELEMENTARY MIDDLE HIGH GERMAN.** First term, credit three hours. Prerequisite courses 1-6, and at least six hours advanced work in literature. Assistant Professor POPE. M W F, 12, Goldwin Smith 177.

Grammar; reading of the popular epics, *Nibelungenlied* and *Kudrun*; German prose of the twelfth and thirteenth centuries. Paul's *Mittelhochdeutsche Grammatik*; Bachmann's *Mittelhochdeutsches Lesebuch*.

33. **MODERN SCANDINAVIAN.** First term, credit three hours. Dr. ANDREWS. T Th S, 12, Goldwin Smith 177.

A brief study of the principles of Danish grammar, followed by readings from standard Danish authors.

34. **MODERN SCANDINAVIAN.** Second term, credit three hours. Dr. ANDREWS. T Th S, 12, Goldwin Smith 177.

Readings from standard Norwegian authors with a brief outline of the history of the Dano-Norwegian language and literature.

35. **TEACHERS COURSE.** Second term, credit two hours. Prerequisite courses 1-6, and twelve hours advanced work in German literature or philology. Professor FAUST, assisted by other members of the German department. F, 2-4, Goldwin Smith 181.

Methods of teaching modern languages; examination and criticism of textbooks available for the study of German; requirements for teachers' examinations, etc.

36. **ADVANCED MIDDLE HIGH GERMAN.** Second term, credit three hours. Prerequisite course 32. Assistant Professor POPE. M W F, 12, Library, German Seminary Room.

Detailed study of Middle High German grammar. Special study of Gottfried von Strassburg, and Walther von der Vogelweide.

Primarily for graduates.

37. **GOTHIC.** First term, credit three hours. Assistant Professor POPE. T Th S, 10, Library, German Seminary Room.

Streitberg's *Gotisches Elementarbuch*; *Die Gotische Bibel*, hrg. von Streitberg. This course will serve as a general introduction to Germanic philology.

Primarily for graduates.

38. **OLD HIGH GERMAN.** Second term, credit three hours. Prerequisite course 32. Assistant Professor POPE. M W F, 9, Goldwin Smith 177.

Continuation of course 37. Braune's *Althochdeutsche Grammatik*; Braune's *Althochdeutsches Lesebuch*.

Primarily for graduates.

[39. **OLD ICELANDIC.** Throughout the year, credit three hours. Dr. ANDREWS.

A study of the elements of Old Norse grammar and the relation of Old Norse to the other Germanic dialects. Reading from the Saga-literature and the Eddic poems with some attention to Old Norse life and antiquities.

Primarily for graduates.]

Not given in 1910-11.

40. **HISTORY OF MODERN HIGH GERMAN.** Second term, credit two hours. Prerequisite course 32. Dr. ANDREWS. M W, 12, Goldwin Smith 177.

The origins and development of the present German literary language will be studied with critical consideration of the sources.

Primarily for graduates.

41. **GERMAN SEMINARY.** First term, credit two hours. Professor FAUST. F, 2-4, Goldwin Smith 181.

The classical German drama. Reports and independent investigation by members of the seminary.



42. GERMAN SEMINARY. Second term, credit two hours. Professor FAUST. T, 2-4, Goldwin Smith 181.

The young Goethe. Reports and independent investigation by members of the seminary.

[43. PHILOLOGICAL SEMINARY. Throughout the year, credit two hours a term. Assistant Professor POPE.

Discussion of special topics in the field of Germanic philology. Subject for 1911-12: Old Saxon literary monuments].

Not given in 1910-11.

[44. INTRODUCTION TO THE STUDY OF LANGUAGE. First term, credit three hours. Professor BRISTOL.

See course I in General Philology.]

Not given in 1910-11.

#### DEUTSCHER VEREIN

The Deutscher Verein, a club consisting of faculty members and students interested in the study of German literature and institutions, meets twice a month for social intercourse, lectures and discussions, and practice in speaking German. Musical and dramatical entertainments alternate with literary programs as regular features of the Verein's activities. In 1909-10 lectures in German were given on the following subjects: The German dirigible airship; personal reminiscences of barracks and camp in the German army; the Leipzig Messe; the German participation in the defense and advance of the American frontier; German historians; Franz Liszt; Theodor Fontane; and German ballads.

#### ROMANCE LANGUAGES

Except by special permission, only the following courses are open to freshmen: French 1, 2, 3, 12; Spanish 40, 42; Italian 30, 32.

1. FIRST YEAR FRENCH. Repeated in second term, credit six hours.

First term,

Sec. 1, daily, 12, Goldwin Smith 281. Mr. MASON.

Sec. 2, daily, 11, Goldwin Smith 290. Assistant Professor GORDON.

Sec. 3, daily, 9, Goldwin Smith 277. Dr. PUMPELLY.

Sec. 4, daily, 8, Goldwin Smith 290. Dr. PUMPELLY.

Second term,

Sec. 1, daily, 12, Goldwin Smith 281. Mr. MASON.

A course for beginners, with special reference to composition.

2. SECOND YEAR FRENCH. Repeated in second term, credit five hours. Prerequisite course 1, or the equivalent.

First term,

Sec. 1, M T W Th F, 9, Goldwin Smith 281. Mr. MASON.

Sec. 2, M T W Th F, 10, Goldwin Smith 290. Assistant Professor LIVINGSTON.

Sec. 3, M T W Th F, 12, Goldwin Smith 290. Dr. PUMPELLY.

Second term,

Sec. 1, M T W Th F, 11, Goldwin Smith 290. Assistant Professor GORDON.

Sec. 2, M T W Th F, 10, Goldwin Smith 290. Dr. PUMPELLY.

Sec. 3, M T W Th F, 12, Goldwin Smith 290. Dr. PUMPELLY.

Composition and reading of modern texts.

3. **THIRD YEAR FRENCH.** Repeated in second term, credit three hours. First term,

Sec. 1, M W F, 11, Goldwin Smith 281. Professor COMFORT.

Sec. 2, T Th S, 11, Goldwin Smith 281. Mr. MASON.

Sec. 3, T Th S, 12, Goldwin Smith 277. Mr. ———.

Second term,

Sec. 1, T Th S, 9, Goldwin Smith 281. Mr. MASON.

Designed primarily for freshmen who have passed the advanced entrance examination. It is prerequisite for all the following courses in French, except 12 which may be profitably taken in connection with it. Emphasis is laid upon the accurate translation in class of difficult texts, with the necessary grammatical explanations.

4. **HISTORY OF FRENCH LITERATURE.** Second term, credit three hours. Prerequisite course 3.

Sec. 1, M W F, 11, Goldwin Smith 281. Professor COMFORT.

Sec. 2, T Th S, 9, Goldwin Smith 290. Assistant Professor GUERLAC.

Lectures on French literature since the Middle Ages, with outside reading and reports. Section 1 is conducted in English; section 2, in French. Prerequisite for all the following courses in French literature, but not for courses 12 and 14.

5. **FRENCH LITERATURE OF THE SEVENTEENTH CENTURY.** Throughout the year, credit three hours a term. Prerequisite course 3. Professor COMFORT. M W F, 9, Goldwin Smith 290.

Reading of classic texts: Corneille, Molière, Racine, Boileau, Descartes, Pascal, Bossuet, Lafontaine, La Bruyère, and Mme. de Sévigné. Outside reading.

- [6. **FRENCH LITERATURE OF THE EIGHTEENTH CENTURY.** Throughout the year, credit three hours a term. Prerequisite course 3. Professor OLMSTED.]

Not given in 1910-11.

7. **FRENCH LITERATURE OF THE NINETEENTH CENTURY.** Throughout the year, credit three hours a term. Prerequisite course 3. Mr. MASON. T Th S, 10, Goldwin Smith 281.

The main currents of French literature since Chateaubriand and Mme. de Staël are treated in lectures. Outside reading and reports.

8. **FRENCH DRAMATIC LITERATURE.** Throughout the year, credit three hours a term. Prerequisite course 3. Professor OLMSTED. M W F, 11, Goldwin Smith 283.

Study of the French drama since 1550. The classical period will be studied during the first term, and the drama since 1830 during the second term.

9. **THE FRENCH PHILOSOPHERS, MORALISTS, AND HISTORIANS FROM DESCARTES TO TAINE.** First term, credit three hours. Prerequisite course 3. Assistant Professor GUERLAC. M W F, 12, Goldwin Smith 277. Lectures, outside reading, and reports.

10. **HISTORY OF FRENCH LITERARY CRITICISM SINCE THE SEVENTEENTH CENTURY.** Second term, credit three hours. Prerequisite course 3. Assistant Professor GUERLAC. M W F, 12, Goldwin Smith 277. Lectures, outside reading, and reports.

12. **ELEMENTARY FRENCH CONVERSATION AND COMPOSITION.** Throughout the year, credit three hours a term. Prerequisite course 2 or the equivalent. Sec. 1, M W F, 11, Goldwin Smith 277. Assistant Professor GUERLAC.

Sec. 2, T Th S, 10, Goldwin Smith 277. Assistant Professor GUERLAC.

Intended for students who have had at least two years of French. The course is carried on entirely in French. The work consists of drill in com-



position and conversation, frequent themes, short talks by the students on French literature, and a rapid course in French history and institutions. Recommended in connection with courses 3 and 4.

14. **ADVANCED FRENCH CONVERSATION AND COMPOSITION.** Throughout the year, credit three hours a term. Prerequisite course 12. Assistant Professor GUERLAC. T Th S, 11, Goldwin Smith 277.

Open only to those who in the judgment of the instructor are capable of pursuing the course with profit.

18. **FRENCH LYRIC POETRY.** Throughout the year, credit one hour a term. Prerequisite course 3. Professor OLMSTED. T, 10, Goldwin Smith 283.

Lectures on the versification, form, and the general development of lyric poetry in France since the fifteenth century.

22. **FRENCH LITERATURE OF THE SIXTEENTH CENTURY.** First term, credit three hours. Prerequisite course 3. Assistant Professor GORDON. T Th S, 12, Goldwin Smith 283.

Readings from Montaigne, Rabelais, Calvin, and the poets of the Pléiade. Lectures on the literature of the Renaissance in France.

23. **FRENCH PHILOLOGY.** Throughout the year, credit three hours a term. The first term's work consists of a study of vulgar Latin in a course offered by the Department of Latin (Latin 47, Professor DURHAM, Goldwin Smith 128). The second term is devoted to lectures on old French forms and syntax, followed by a study of the oldest texts. Assistant Professor GORDON. T Th S, 12, Goldwin Smith 283.

This course must be taken during the first year of graduate study, if not before, as it is required of candidates for the Master's degree who present French as their major subject.

[24. **MEDIEVAL FRENCH LITERATURE.** Throughout the year, credit one hour a term. Professor COMFORT.]

Not given in 1910-11.

26. **TEACHERS COURSE.** First term, credit two hours. W, 2.30, Goldwin Smith 277.

Intended for those who are preparing to teach. This course will be conducted by the various members of the department. Methods of instruction in phonetics, grammar, and literature will be considered in relation to the needs of the teacher.

28. **OLD FRENCH TEXTS.** Throughout the year, credit two hours a term. Prerequisite course 23. Professor COMFORT. T, 2.30, Library, French Seminary.

A linguistic and literary study of old French texts. In 1910-11 the texts studied will be *la vie de S. Alexis* (ed. G. Paris) and the romances of *Chrétien de Troyes* (ed. Förster).

Primarily for graduates.

30. **FIRST YEAR ITALIAN.** Throughout the year, credit three hours a term. Assistant Professor LIVINGSTON. M W F, 9, Goldwin Smith 283.

Pronunciation, grammar, composition, and reading. This course may not be taken in the same year with course 40.

32. **SECOND YEAR ITALIAN.** Throughout the year, credit three hours a term. Prerequisite course 30. Assistant Professor LIVINGSTON. T Th S, 9, Goldwin Smith 283.

Reading and composition. Lectures on nineteenth century prose and poetry. Outside reading.

33. **PETRARCH AND MODERN POETRY.** Throughout the year, credit two hours a term. Prerequisite course 32. Assistant Professor LIVINGSTON. Hours to be arranged.

Lectures on Petrarch. Readings from Petrarch, Lorenzo il Magnifico, Poliziano, Sannazaro, Pontano, Bembo, Vittoria Colonna, Michael Angelo, and the court poets of the Renaissance.

[34. **BOCCACCIO AND MODERN PROSE.** Throughout the year, credit two hours a term. Prerequisite course 32. Assistant Professor LIVINGSTON.]  
Not given in 1910-11.

[35. **DANTE AND THE MIDDLE AGE.** Throughout the year, credit two hours a term. Prerequisite course 32. Assistant Professor LIVINGSTON.]  
Not given in 1910-11.

36. **OLD ITALIAN.** Throughout the year, credit two hours a term. Assistant Professor LIVINGSTON. Hours to be arranged.

Lectures on the history of the Italian language and the development of the literary tongue. Outline of the dialect phonology and morphology. Readings from old Italian texts.

Primarily for graduates.

40. **FIRST YEAR SPANISH.** Throughout the year, credit three hours a term.

Sec. 1, M W F, 10, Goldwin Smith 283. Professor OLMSTED.

Sec. 2, M W F, 12, Goldwin Smith 283. Assistant Professor GORDON.

Sec. 3, T Th S, 8, Goldwin Smith 283. Assistant Professor GORDON.

Grammar, composition, and reading. This course may not be taken in the same year with course 30.

42. **SECOND YEAR SPANISH.** Throughout the year, credit three hours a term. Prerequisite course 40 or the equivalent. Professor COMFORT. M W F, 10, Goldwin Smith 281.

Rapid reading in class of modern Spanish authors: Alarcón, Galdós, Valdés, and Echegaray. Outside reading.

46. **SPANISH CLASSICAL LITERATURE.** Throughout the year, credit two hours a term. Prerequisite course 42 or the equivalent. Professor OLMSTED. T Th, 11, Goldwin Smith 278.

Cervantes: Don Quixote and Novelas Ejemplares; dramas of Calderon and Lope de Vega.

47. **OLD SPANISH.** Throughout the year, credit two hours a term. Prerequisite course 46. Professor OLMSTED. Hours to be arranged.

A study of old Spanish grammar and of the development of the language. Reading of early texts.

Primarily for graduates.

48. **SPANISH SEMINARY.** Throughout the year, credit two hours a term. Professor OLMSTED. Hours to be arranged.

The Spanish mystics.

[50. **PORTUGUESE GRAMMAR AND READING.** Throughout the year. Professor OLMSTED. Primarily for graduates.]

Not given in 1910-11.

60. **OLD PROVENÇAL.** Throughout the year, credit one hour a term. Assistant Professor LIVINGSTON. Hours to be arranged.

Lectures on the literature of Provence; Provençal influence upon Italian literature in the thirteenth century; the linguistic relations of Provence and the Catalan districts. Readings from old texts. Primarily for graduates.



# ENGLISH

1. **INTRODUCTORY COURSE.** Throughout the year, credit four hours a term. Open to students who have satisfied the entrance requirement in English. Professor STRUNK, Assistant Professors PRESCOTT and ADAMS, Drs. MONROE, COX, BAILEY, and BROUGHTON, Messrs. KIRK, SMITH, and PRALL. Seventeen sections, at the following hours: M W F S, 8, 9, 11, 12; M T Th F, 10, 11, 12; T W Th F, 10, 11. Rooms to be announced.

A study of representative works in English literature, including three plays of Shakespeare, five modern novels, and selected lyrics and essays. Practice in composition in connection with the reading, with incidental study of the principles of writing. This course will hereafter be required for admission to all other courses offered by the department. The course is in charge of Professor STRUNK.

Students who elect English 1 must apply at Goldwin Smith 159 on Tuesday, Wednesday, or Thursday of registration week for assignment to sections.

2. **NINETEENTH CENTURY PROSE; COMPOSITION.** Throughout the year, credit three hours a term. Prerequisite course 1.

Sec. 1, T Th S, 12, Goldwin Smith 164. Assistant Professor PRESCOTT.

Sec. 2, M W F, 9, Goldwin Smith 162. Mr. KIRK.

Reading of English prose with especial reference to style; practice in composition, with conferences.

5. **ADVANCED COMPOSITION.** Throughout the year, credit three hours a term. Prerequisite course 2 or 22. Mr. ——. M W F, 10, Goldwin Smith 163.

Essays, short stories, and other exercises. Intended especially for students that look forward to writing as a profession.

6a. **ARGUMENTATIVE COMPOSITION.** First term, credit three hours. Prerequisite course 1. Dr. MONROE. T Th S, 12, Goldwin Smith 160.

A study of the principles of argumentative writing, with practice in composition.

[7a. **THE NOVEL.** First term, credit three hours.

A literary and rhetorical study of representative novels; the general principles and special forms of the novel; written exercises.]

Not given in 1910-11.

[7b. **THE SHORT STORY.** Second term, credit three hours.

The principles of short story writing; study of selected specimens; frequent exercises in story writing.]

Not given in 1910-11.

[8. **PRINCIPLES OF RHETORIC.** Throughout the year, credit three hours a term. Prerequisite course 2 or 22. Dr. COX.

A study of the fundamental principles underlying rhetoric as set forth by Aristotle, with references to modern exposition of the subject. Theories of prose style; detailed examination of the styles of Swift, DeQuincey, and Carlyle; papers and discussions].

Not given in 1910-11.

9b. **TEACHERS COURSE.** Second term, credit one hour. Professor SAMPSON and Dr. BAILEY. T, 3, Goldwin Smith 160.

Lectures and conferences on the teaching of English in the secondary schools. Open to seniors and graduates who intend to teach English.

10. **PLAY WRITING.** Throughout the year, credit two hours a term. Professor SAMPSON. T Th, 10, Goldwin Smith 163.

Open to upperclassmen who have distinguished themselves in composition, or who show some special aptitude for the proposed work.

11. OLD ENGLISH. Throughout the year, credit three hours a term. Prerequisite course 1. Dr. MONROE. M W F, 11, Goldwin Smith 163.

Reading of selections from the Old English Chronicle, King Alfred, Ælfric, and other representative prose texts, and of the simpler poetry. Some attention is given to one or two important Middle English texts. Supplementary lectures on the growth of the language.

No student will be recommended for a high school teachership in English unless he has had this course or its equivalent.

12. MIDDLE ENGLISH. Throughout the year, credit two hours a term. Prerequisite course 11. Professor STRUNK. T Th, 9, Goldwin Smith 160.

A study of the language and of representative authors from the twelfth to the fifteenth centuries, including Chaucer.

[18a. LINGUISTICS. First term. Dr. MONROE.

A survey of the principles of the life and growth of language. An elementary course of lectures and assigned reading, the illustrative material being chosen mainly from English as a living speech].

Not given in 1910-11.

22. NINETEENTH CENTURY POETRY. Throughout the year, credit three hours a term. Prerequisite course 1.

Sec. 1, M W F, 11, Goldwin Smith 156. Professor SAMPSON.

Sec. 2, T Th S, 9, Goldwin Smith 162. Assistant Professor COOPER.

Sec. 3, T Th S, 10, Goldwin Smith 164. Professor STRUNK.

Wordsworth, Coleridge, Byron, Shelley, and Keats, and assigned readings in prose.

24. ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS. Throughout the year, credit three hours a term. Prerequisite course 2 or 22. Assistant Professor COOPER. T, 3, Th 3-5, Goldwin Smith 163.

Rapid reading in the best accessible translations, with emphasis upon Greek masterpieces; for example, the Iliad and the Odyssey, selected plays of Sophocles, and selected dialogues of Plato. Translations from the Latin will be chosen for the bearing of the originals on modern literature.

25b. OLD ENGLISH READINGS. Second term, credit two hours. Prerequisite, first term of 11. Dr. MONROE. M W, 3, or hours to be arranged, Goldwin Smith 164.

Reading of selected Old English works, including portions of Beowulf.

[31. SEVENTEENTH CENTURY POETRY AND PROSE. Throughout the year, credit three hours. Prerequisite course 2 or 22. Dr. BAILEY.

Non-dramatic literature from the beginning of the century to the Restoration. The poems of Milton and the lyrists, the Bible; the prose of Milton, Browne, and Bunyan].

Not given in 1910-11.

32. ENGLISH AND SCOTTISH BALLADS. Throughout the year, credit three hours a term. Prerequisite course 2 or 22. Dr. COX. M W F, 12, Goldwin Smith 160.

Study of the ballad as a form of literature; the theories of its origin and development; its relations to other forms of early narrative poetry and to the modern literary ballad; comparison with kindred ballads of other nations.

[33. EIGHTEENTH CENTURY PROSE. Throughout the year.

The essays, political satires, novels, and orations of the period].

Not given in 1910-11.



37. SHAKESPEARE. Throughout the year, credit three hours a term. Prerequisite course 2 or 22. Professor STRUNK. M W F, 10, Goldwin Smith 164.

A study of representative plays, together with a survey of the Elizabethan period and its literature.

38b. EIGHTEENTH CENTURY POETRY. Second term, credit three hours. Prerequisite course 2 or 22. Dr. MONROE. T Th S, 12, Goldwin Smith 160.

A study of Pope, Thomson, Gray, Goldsmith, and Burns; readings from the lesser poets.

41. THE ENGLISH DRAMA TO 1642. Throughout the year, credit three hours a term. Prerequisite course 2 or 22. Assistant Professor ADAMS. T Th S, 11, Goldwin Smith 163.

First term: a study of the origin of the drama, miracles, moralities, interludes, and the first regular comedies and tragedies. Second term: a study of Elizabethan society and playhouses, characteristic plays of Lyly, Peele, Kyd, Greene, Marlowe, Jonson, and Beaumont and Fletcher; assigned readings in other representative dramatists.

48. AMERICAN LITERATURE. Throughout the year, credit three hours a term. Prerequisite course 2 or 22. Assistant Professor PRESCOTT. M W F, 12, Goldwin Smith 164.

First term: the growth of American literature; Irving, Bryant, Cooper, and Poe. Second term: Emerson, Longfellow, Hawthorne, and Whitman.

51. DANTE IN ENGLISH. Throughout the year, credit two hours a term. Prerequisite course 2 or 22. Assistant Professor COOPER. M, 3-5, Goldwin Smith 163.

A certain amount of reading for the sake of literary and historical perspective followed by a study in detail of selections from the Divine Comedy and the New Life.

Open to seniors and graduates.

52. VICTORIAN POETRY. Throughout the year, credit three hours a term. Prerequisite course 2 or 22. Dr. BAILEY. M W F, 9, Goldwin Smith 163.

A study of the leading works of Tennyson, Browning, Matthew Arnold, Clough, William Morris, Swinburne, and the Rossetis, and of the characteristics of the Victorian era.

[54. METHODS AND MATERIALS IN THE STUDY OF ENGLISH. Throughout the year, credit three hours a term. Assistant Professor COOPER.

Reading of important treatises on the method of scholarship; a study of the relations between English and similar disciplines; an introduction to the bibliography of English. Applicants must be prepared to read French and German.]

Not given in 1910-11.

[56. THE ARTHURIAN LEGENDS. Throughout the year, credit two hours a term. Prerequisite courses 11, 22. Assistant Professor NORTHUP.

Studies in the origin and growth of the Arthurian legends contained in the chronicles and the romances, with some attention to the use of the legends by modern European poets.]

Not given in 1910-11.

58b. AMERICAN LITERATURE. Second term, credit two hours. Prerequisite course 48, or other adequate preparation. Assistant Professor PRESCOTT. T Th, 11, Goldwin Smith 164.

A study of the literary relations between England and America.

59. DRAMATIC STRUCTURE. Throughout the year, credit three hours a term. Prerequisite course 37 or 41. Professor SAMPSON. M W F, 12, Goldwin Smith 163.

A study of the principles of dramatic construction, based mainly upon English drama of the seventeenth and nineteenth centuries, but with frequent illustration from classical and modern continental drama.

61. SEMINARY IN THE ELIZABETHAN DRAMA. Throughout the year, credit two hours a term. Assistant Professor ADAMS. Th, 3-5, Library, English Seminary Room.

Designed to familiarize the student with the apparatus necessary for research in the drama from its beginnings to the Restoration.

Primarily for graduates.

62. THE ROMANTIC AND EPIC MATERIAL OF THE MEDIEVAL IRISH. Throughout the year. Dr. COX.

The Ossianic cycle of romances and their relation to Macpherson's Ossian; the Epic of the Tain, its form and content.

63. LAYAMON'S BRUT. Throughout the year. Dr. MONROE.

Textual and historical study of the poem with special reference to its connection with the Arthurian legend.

Primarily for graduates.

65. THE PRINCIPLES OF LITERARY CRITICISM. Throughout the year, credit two hours a term. Prerequisite course 2 or 22. Assistant Professor COOPER. W, 3-5, Goldwin Smith.

Primarily designed for those who intend to teach English. Candidates must satisfy the instructor concerning the extent of their previous reading. A study, in part historical, of the most important theories of poetry.

[66. THE EPIC AND THE ROMANCE. Throughout the year, credit two hours a term. Prerequisite courses 11, 22. Assistant Professor NORTHUP.

A study of the forms of classic and medieval narrative, and especially of selected Middle English romances and their relations to continental literature.]

Not given in 1910-11.

67. THE PHONOLOGY, INFLECTIONS, AND METRE OF OLD ENGLISH. Throughout the year. Professor STRUNK.

The relation of Old English to Modern English and to German. Readings in Elene or Beowulf.

68. AMERICAN LITERATURE. Throughout the year. Assistant Professor PRESCOTT.

Primarily for graduates.

69. ELIZABETHAN DRAMATIC STRUCTURE. Throughout the year. Professor SAMPSON.

Primarily for graduates.

#### PRIZES

For the Guilford, Shakespeare, Browning, and Morrison prizes, see the University pamphlet on prizes: Regulations and Conditions Governing Prize Competitions. Copies may be obtained from the Registrar.

The subjects for the Corson Browning Prize competition in 1910-11 are: Browning's treatment of external nature; Browning's alterations in the material of the Ring and the Book; Browning as a dramatist; Browning's villains.

The subjects for the Barnes Shakespeare Prize competition are not prescribed, being subject only to the restriction that they must be taken from the writings of Shakespeare. The following subjects are offered as suggestions: the dramatic value of the alterations made by Shakespeare in the story of Romeo and Juliet; Shakespeare's songs; a comparison between Shakespeare's Richard II and Marlowe's Edward II; a critical study of Cymbeline; Shakespeare's conception of the English monarchy.



## ORATORY

1a. PUBLIC SPEAKING. Repeated in second term, credit three hours. First term :

Sec. 1, M W F, 9, Goldwin Smith 24. Mr. BLANTON.

Sec. 2, M W F, 10, Goldwin Smith 24. Assistant Professor EVERETT.

Sec. 3, M W F, 12, Goldwin Smith 24. Assistant Professor WINANS.

Second term : T Th S, 11, Goldwin Smith 21. Mr. ———.

Designed to give the student the fundamentals of speech preparation and to help him to acquire a simple, direct manner of speaking. Original speeches and interpretation of selections. Individual instruction will be given by appointment.

Students who elect this course should apply at Goldwin Smith 25, on Wednesday or Thursday of registration week for assignment to sections.

The '86 Memorial Prize in declamation is awarded annually in connection with the courses in public speaking. See special pamphlet on prizes.

1b. PUBLIC SPEAKING. Second term, credit three hours. Prerequisite course 1a.

Sec. 1, M W F, 9, Goldwin Smith 24. Mr. BLANTON.

Sec. 2, M W F, 10, Goldwin Smith 24. Assistant Professor EVERETT.

Sec. 3, M W F, 12, Goldwin Smith 24. Assistant Professor WINANS.

A continuation of course 1a.

1c. SPECIAL COURSE FOR WOMEN. Throughout the year, credit three hours a term. Mr. BLANTON. T Th S, 10, Goldwin Smith 21.

Reading, speaking, and voice training. Satisfactory completion of this course admits to courses 2, 5, 6, 7, and 8.

2. PUBLIC SPEAKING. Repeated in second term, credit one hour. Prerequisite courses 1a and 1b.

Delivery of speeches before the sections of courses 1a and 1b; individual instruction and criticism.

3. PUBLIC SPEAKING FOR ENGINEERS. Repeated in second term, credit two hours. M W, 12, Goldwin Smith 21.

Engineering students whose work permits are advised to take courses 1a and 1b. Those who take this course in the first term may for the second term continue in course 1b (three hours) or course 3 (two hours). Satisfactory completion of 3 will be considered preparation for 5, 6a, 8, and in exceptional cases for 7a.

4. VOICE TRAINING. Throughout the year, one hour a term. Mr. BLANTON. M W F, 8.30-9, Goldwin Smith 21.

For the development and improvement of normal voices, and for removal of special defects. Training in action. Individual instruction by appointment.

[5. READING. Throughout the year, credit two hours a term. Mr. BLANTON.

Oral interpretation of prose, poetry, and dramatic literature. Open, with consent of the instructor, to those who have completed or are taking any one of the foregoing courses in this department].

Not given in 1910-11.

6a. BRIEF MAKING AND DEBATE. First term, credit two or three hours. Assistant Professor WINANS. S, 11-1 and by appointment, Goldwin Smith 21.

Study of the principles of argumentation and the forms of brief-writing; textbook, discussions, and conferences. Oral arguments based upon written briefs. As soon as announced, the intercollegiate debate question will receive attention. Designed to give training in fair-minded discussion, the use of authorities, and the weighing of evidence.

6b. DEBATE. Second term, two or three hours. Prerequisite courses 1a or 3, and 6a or English 6a. Assistant Professor WINANS. S, 11-1 and by appointment, Goldwin Smith 21.

6c. DEBATE. Either term, credit one hour. Prerequisite course 6b. S, 11-1.

By registering in this course students may continue the work of either 6a or 6b.

In the field of extemporaneous debate the University offers the '94 Memorial Prize. See special pamphlet on prizes.

7a. EXTEMPORANEOUS SPEAKING. First term, credit two or three hours. Assistant Professor EVERETT. M, 3-5 and by appointment, Goldwin Smith 21.

Weekly addresses based upon prepared outlines; topics assigned in the fields of American history, politics, and current events; stories and descriptions. One carefully prepared written speech. Woodford orations may be worked out in connection with this course.

Open by special permission to upperclassmen who have done satisfactory work in course 1b.

7b. EXTEMPORANEOUS SPEAKING. Second term, credit two or three hours. Prerequisite course 7a. Assistant Professor EVERETT. M, 3-5 and by appointment, Goldwin Smith 21.

[8. THE WRITTEN SPEECH. First term, credit two or three hours. Prerequisite course 1, and sufficient preparation in composition. Assistant Professor WINANS.

Study of the principles of oratory; the writing of speeches with careful attention to both matter and form; practice in delivery.]

Not given in 1910-11.

[9. MASTERS AND MASTERPIECES. Second term, credit two hours. Open to upperclassmen. Assistant Professor WINANS.

In connection with a given oration there will be considered the orator, the subject-matter and its treatment, the events out of which the oration grew, and its influence. Different fields will be covered in different years, for instance, general survey of the history of oratory, great debates, political and legal, British and American oratory.]

Not given in 1910-11.

## PHILOSOPHY

1. INTRODUCTION TO PHILOSOPHY. First term, credit three hours. Professor THILLY. M W F, 11, Goldwin Smith 225.

Lectures, discussions, and prescribed reading.

The fundamental problems of philosophy, together with a critical study of the most important solutions that are offered to them by thinkers to-day. The nature and scope of philosophy; its relation to the physical and mental sciences and religion; materialism; idealism; dualism; the double-aspect theory; the mechanical theory of the world; the teleological theory; the theory of evolution; the belief in God; rationalism, empiricism, and criticism; realism and idealism.

2. ELEMENTARY PSYCHOLOGY. First term, credit three hours. Assistant Professor BENTLEY, Drs. GEISSLER and SCHAUB and Mr. JONES. Lectures T Th, 11, class room work S, 11, Goldwin Smith C.

Intended as an introduction to psychology. A general account of the human mind and of the scientific methods used in the study of mental phenomena.



3. LOGIC. Second term, credit three hours. T Th S, 11, Goldwin Smith C. Acting Assistant Professor SABINE and Mr. JONES; T Th S, 9, Goldwin Smith 225. Dr. SCHAUB.

The general character of the thinking process, its laws of development, and the methods by which thought actually proceeds to solve the problems presented to it; the analysis of logical arguments and the detection of fallacies, in both the deductive and the inductive processes of reasoning. Creighton's Introductory Logic will be used as a text-book.

4. THE FINE ARTS: THEIR PHILOSOPHY AND HISTORY IN OUTLINE. First term, credit three hours. Professor HAMMOND. T Th S, 10, Goldwin Smith 227.

An elementary course on aesthetics. Lectures, assigned readings, and examinations. An historical survey of the more important branches of art and the psychology of the appreciative feelings and the aesthetic judgment.

5. ETHICS. First term, credit three hours. Professor THILLY. M W F, 9, Goldwin Smith 225.

Lectures and discussions.

The moral consciousness and the fundamental conceptions of morality. The nature and methods of ethics; theories of conscience; analysis of conscience; the ultimate ground of moral distinctions; the teleological conception; hedonism; energism; critique of hedonism; the highest good; optimism and pessimism; free will and determinism. Thilly's Introduction to Ethics will be used as a text-book.

6. MORAL IDEAS AND PRACTICE. Second term, credit three hours. Professor THILLY. M W F, 9, Goldwin Smith B.

Lectures, discussions, and prescribed reading.

The development of moral ideas and practices from primitive times to the present, with an examination of the fundamental virtues and duties. The morals of savagery and barbarism; the moral practices and ideals of the Hebrews, Greeks, and Romans; primitive Christianity; the medieval ideal, the modern ideal; the virtues and duties pertaining to bodily, economic, and mental life; self-control; the love of honor; justice; charity; veracity.

7. THE PHILOSOPHY AND CULTURE OF THE RENAISSANCE. Second term, credit two hours. Professor HAMMOND. T Th, 10, Goldwin Smith 227.

Lectures and assigned readings. The lectures will deal with the philosophy of humanism from 1300 to 1600 A. D., and will include an outline history of literature, the fine arts, and science during that period.

8. THE RELATIONS BETWEEN PHILOSOPHY AND LITERATURE DURING THE NINETEENTH CENTURY. Second term, credit one hour. Professor ALBEE. S, 10, Goldwin Smith 221.

The general influence of philosophical conceptions, and particularly of German idealism, upon certain British and American writers of the nineteenth century. The opening lectures will discuss the general relations between philosophy and literature, and outline and contrast the leading philosophical conceptions of eighteenth and nineteenth century thought. Coleridge, Wordsworth, Shelley, Browning, Carlyle, Emerson, and Whitman will then be considered from the point of view of their philosophical significance.

9. EXPERIMENTAL PSYCHOLOGY. Throughout the year, credit, first term, three hours; second term, one to three hours. Prerequisite course 2. Assistant Professor BENTLEY, Dr. GEISSLER and Mr. ——. M W F, 3, Morrill, Psychological Laboratory.

This course may be entered either in the first or in the second term. Qualitative experiments upon sensation, affection, attention and action, perception and idea, and the association of ideas. Text-book, Titchener's Experimental Psychology, pt. i. Quantitative: verification of Weber's Law



in the various departments of sense, determination of stimulus limens, the psychophysics of selective and volitional action (compound reaction experiments), etc. Text-book, Titchener's *Experimental Psychology*, pt. ii. Experiments in comparative psychology may, at the discretion of the department, be pursued during one term.

10. HISTORY OF PHILOSOPHY. Throughout the year, credit three hours a term. Acting Assistant Professor SABINE. T Th S, 9, Goldwin Smith 225.

Intended primarily for the general student that wishes to know something of the history of thought and of the influence that philosophical ideas have exerted in the development of civilization. A general account of the history of philosophical speculation from its origin among the Greeks to the present time; the various philosophical systems in their relation to the science and general civilization of the ages to which they belong, and their application to social, political, and educational problems; a study of the speculative problems of the present century, and especially an examination of the philosophical meaning and importance of the notion of evolution or development. Reading will be assigned from time to time, but there will be no class text-book.

An elementary course, but not open to students below the junior year.

11. PLATONISM. Second term, credit two hours. Professor HAMMOND. T Th, 11, Goldwin Smith 227.

Reading of the dialogues in English translation, discussions and lectures on Plato's philosophy. The dialogues to be read in 1910-11 are the *Apology*, *Crito*, *Phaedo*, *Meno*, *Lysis*, *Protagoras*, *Phaedrus*, and *Republic*.

12. THE THEORY OF EVOLUTION: ITS HISTORY AND SIGNIFICANCE. Throughout the year, credit one hour a term. Mr. JONES. F, 12, Goldwin Smith 227.

The history of the theory of evolution from the first appearance of the concept among the Greeks to its formulation in modern times by Darwin; the recent modifications of the theory, and the application of the evolutionary method to the various sciences, special attention being directed to its bearing on ethics, sociology, and religion; an estimate of the significance of the evolutionary point of view for a theory of the world as a whole.

Intended primarily for undergraduates. No acquaintance with the history or special terminology of philosophy is presupposed.

13. ORIGIN AND DEVELOPMENT OF RELIGIOUS IDEAS. First term, credit two hours. Dr. SCHAUB. T Th, Goldwin Smith 231.

The origin of religious belief and the conditions of its development, with a brief examination of various forms of primitive religion; the history and significance of the more highly developed religions, such as Buddhism, Judaism, Mohammedanism, and Christianity.

14. PROBLEMS OF THE PHILOSOPHY OF RELIGION. Second term, credit two hours. Dr. SCHAUB. T Th, 12, Goldwin Smith 231.

Certain of the chief problems of the psychology and philosophy of religion in the light of historical facts. Especial consideration will be given to the philosophical basis of theism.

15. READING OF GERMAN PSYCHOLOGY. Throughout the year, credit one hour a term. Dr. GEISSLER. S, 9, Morrill Hall, Psychological Laboratory Lecture Room.

Translation of Ebbinghaus, *Abriss der Psychologie*, (2nd edition, 1909). The primary aim of this course is to assist toward the accurate rendering of German psychological literature. Some emphasis will be laid upon the interconnection of the various part-problems of the science in order to gain a general view of the whole system of psychological facts.

16. RAPID READING OF GERMAN PHILOSOPHY. Throughout the year, credit one hour a term. Professor HAMMOND. T, 2, Goldwin Smith 220



The primary aim of this course is to aid students in acquiring a knowledge of German philosophical terminology and facility in the translation of philosophical prose. The texts for 1910-1911 will be Windelband's *Platon* and Nietzsche's *Morgenröte*.

17. HISTORY OF ANCIENT AND MEDIEVAL PHILOSOPHY. First term, credit three hours. Professor HAMMOND. T Th S, 11, Goldwin Smith 227.

Lectures and assigned readings. The history of the philosophical ideas in Greece, Rome, the Middle Ages, and the early Renaissance will be discussed in connection with the civilization of these periods.

18. TYPES OF METAPHYSICAL THEORY. First term, credit two hours. Prerequisite course 13 or the equivalent. Acting Assistant Professor SABINE. T Th, 12, Goldwin Smith 221.

Lectures and informal discussions. The leading types of philosophical theory such as materialism, idealism, and pluralism, with a study of some of the fundamental metaphysical problems, and an indication of the nature of the method and principles that modern philosophy employs in their solution.

Courses 18 and 19 are given in alternate years.

[19. PHILOSOPHICAL APPLICATIONS AND RESULTS. First term, credit three hours. Professor CREIGHTON.

Courses 18 and 19 are given in alternate years.]

Not given 1910-11.

20. HISTORY OF ETHICS: ANCIENT, MEDIEVAL, AND RENAISSANCE. First term, credit two hours. Professor HAMMOND. M W, 11, Goldwin Smith 220.

Lectures and assigned readings. A history of moral ideals and reflection in antiquity, the Middle Ages, and the Renaissance, treated in connection with social and political institutions.

21. HISTORY OF MODERN ETHICS. Second term, credit two hours. Professor ALBEE. M W, 11, Goldwin Smith 220.

The history of modern ethics with special reference to the development of the commonly recognized methods of ethics. The history of British ethics will receive particular attention, as illustrating the gradual differentiation of ethics as an independent science or philosophical discipline.

22. GENERAL PSYCHOLOGY. Throughout the year, credit three hours a term. Prerequisite course 2. Assistant Professor BENTLEY and Dr. SCHAUB. M W F, 12, Goldwin Smith.

An intermediate course in human psychology which aims to derive from historical and current writings a coherent account of mind and to explain the relations which psychology sustains to the biological and social sciences.

23. PSYCHOLOGY OF SPECIAL ACTIONS. First term, credit two hours. Dr. GEISSLER. T Th, 9, Morrill, Psychological Laboratory Lecture Room.

A brief review of the reaction experiments; the mental processes involved in such special actions as speaking, singing, reading, writing, musical performance, and games of skill; the analysis and description of mental work, and the consideration of practice, fatigue, rest, and recovery.

24. PSYCHOLOGY OF THE INTELLECTUAL FUNCTIONS. Second term, credit two hours. Dr. GEISSLER. T Th, 9, Morrill, Psychological Laboratory Lecture Room.

A theoretical and experimental examination of the higher intellectual functions, memory, association, imagination, and thought; demonstrations and short practical exercises designed to show the general significance of these mental functions in human experience.

25. ADVANCED PSYCHOLOGICAL LABORATORY. Throughout the year, credit one to five hours a term. Prerequisite courses 2 and 9. Assistant

Professor BENTLEY, Dr. GEISLER, and Mr. ———. Morrill, Psychological Laboratory.

The repetition of certain classical experiments carried out in greater detail and with more accuracy than is possible in course 9, or the original investigation of simple problems suggested by the experiments of course 9.

26. ADVANCED ETHICS. Throughout the year, credit two hours a term. Professor THILLY. W F, 10, Goldwin Smith 220.

Lectures, reading, discussion, and essays. The study and criticism of the ethical theories of J. S. Mill, Spencer, Sidgwick, Kant, and Schopenhauer. Primarily for graduates.

27. THE REPUBLIC OF PLATO. Throughout the year, credit three hours a term. Professor HAMMOND. M W F, 9, Goldwin Smith 220.

Reading of the Greek text. This course is intended for students of Greek literature as well as of Greek philosophy.

28. ARISTOTLE'S ETHICS. Throughout the year, credit two hours a term. Professor HAMMOND. M W, 12, Goldwin Smith 231.

Reading of the Greek text. The Nicomachean Ethics will be read and interpreted in connection with Aristotle's political theory.

Primarily for graduates.

29. THOMAS AQUINAS. Throughout the year, credit two hours a term. Professor HAMMOND. T Th, 12, Goldwin Smith 220.

Selections from the Summa Theologica, with a general survey of the system of Thomas Aquinas and the culmination of scholasticism.

Primarily for graduates.

30. EMPIRICISM AND RATIONALISM. First term, credit three hours. Professor ALBEE. T Th S, 11, Goldwin Smith 220.

Lectures, discussions, and essays. The empirical movement as represented by Locke, Berkeley, and Hume, and the rationalistic movement as represented especially by Descartes, Spinoza, and Leibniz, with reference to their distinctive methods. Locke's Essay, (Bohn edition, 2 vols.) Hume's Treatise of Human Nature, (Clarendon Press), and Leibniz's Philosophical Works (Duncan's translation, Tuttle, Morehouse, & Taylor, New Haven).

Primarily for graduates.

31. THE CRITICAL PHILOSOPHY OF KANT. Second term, credit three hours. Professor ALBEE. T Th S, 11, Goldwin Smith 220.

Lectures, discussions, and essays. A study of the Critique of Pure Reason (Müller's translation), with frequent references to standard commentaries and to the more recent literature on the subject; the relation in which the three Critiques of Kant stand to each other.

Primarily for graduates.

32. EARLY RATIONALISM: SPINOZA AND LEIBNIZ. First term, credit three hours. Professor ALBEE. M W F, 12, Goldwin Smith 220.

Lectures, discussions, and essays. A critical study of early rationalism, with special reference to the divergent tendencies represented by Spinoza and Leibniz. The principal works of both philosophers will be read, and the influence of both upon later speculation will be considered.

Primarily for graduates.

[33. GERMAN PESSIMISM WITH SPECIAL REFERENCE TO SCHOPENHAUER. First term, credit three hours. Professor ALBEE.

Lectures, discussions, and essays.

Primarily for graduates.]

Not given in 1910-11.

34. PROBLEMS AND METHODS IN RECENT PHILOSOPHY. Throughout the year, credit two hours a term. Professor ALBEE. T Th, 12, Goldwin Smith 220.



Lectures. A detailed examination of the problems and methods involved in current philosophical investigation as a basis for a positive treatment of some of the fundamental problems of the present day.

Primarily for graduates.

[35. LOGICAL THEORY. Throughout the year. Professor ALBEE. Lectures, reading of prescribed authors, and discussions.

Primarily for graduates.]

Not given in 1910-11.

36. SEMINARY IN LOGIC AND METAPHYSICS. Throughout the year. Acting Assistant Professor SABINE. F, 10-12, Goldwin Smith 231.

37. SEMINARY IN ETHICS. Throughout the year, credit two hours a term. Professor THILLY. M, 3-5, Goldwin Smith 220.

The subject for 1910-11 will be idealistic theories of ethics.

38. SEMINARY IN ANCIENT AND MEDIEVAL PHILOSOPHY. Throughout the year, credit two hours a term. Professor HAMMOND. W, 3-5, (or hours to be arranged), Goldwin Smith 220.

The work in 1910-11 will be devoted to the reading and discussion of selected dialogues of Plato and the Politics of Aristotle in English translations.

39. SEMINARY IN PSYCHOLOGY. Throughout the year, credit two hours a term. Assistant Professor BENTLEY and Dr. HOLLANDS. Hours to be arranged.

Problems in psychological theory. Essays and reports. Advanced work upon experimental problems may also be included.

EDUCATIONAL PSYCHOLOGY AND MENTAL DEVELOPMENT. See School of Education, courses 4 and 8.

## THE SCHOOL OF EDUCATION

The School of Education was established in 1907 by the Board of Trustees for the purpose of providing professional training, both theoretical and practical, to all persons who are looking forward to teaching, or who are actually engaged in the work.

The School offers courses of instruction for three classes of students :

A. Graduate students. For these are intended courses described as primarily for graduates. These are planned to meet the needs of college graduates that are preparing themselves for positions of leadership in education, as professors of education, superintendents of school systems, and directors or supervisors of special phases of schoolwork. By completing a satisfactory amount of work in education and in such other departments of instruction as each case may demand, these students may receive the degree of Master of Arts or of Doctor of Philosophy.

B. Undergraduates. The distinctive work offered in the School of Education for prospective teachers in secondary schools consists of the courses on the history of education, principles of education, educational psychology, educational administration, and special methods in teaching the subjects in which the student chooses to specialize. By far the largest share of preparation for high school teaching consists of the regular studies of a four years' course in Arts and Sciences. It is expected therefore that the student will give the major portion of his time to the studies in the department or departments that he elects. Further, certain subjects are of such importance for the general culture of all teachers that they are necessary parts of every one's course. Such subjects are physiology, psychology, logic, elementary economics, and at least one foreign language. Beyond all in importance is the ability to speak and write English with accuracy and facility. Students registered in the College of Arts and

Sciences have the opportunity of taking work amounting in all to one year's study in any of the other colleges of the University. This arrangement permits any student to prepare himself for teaching one or more of the so-called special subjects to which so much attention is now paid, such as drawing, manual training, industrial and agricultural education, music, and nature study.

C. Special students. Persons of mature age that either cannot or will not qualify as candidates for a regular university degree, may be admitted to study whatever subjects they wish to pursue. Special courses will be laid out for them, and upon the satisfactory completion of these they will receive certificates indicating what they have done.

At the present time there is a great demand for teachers in the following two fields :

Industrial Education. The School of Education offers training to prepare secondary teachers for this work. For the present year, students that desire such preparation should consult the Director of the School and Professor D. S. Kimball in planning their work for the year. In 1911-1912 a regular course of study will be laid down for these students.

Agriculture. There is now an important movement looking to the introduction of the science of agriculture as a part of the high school system of the state.

Students that wish to qualify in this field should confer with the Director of the School of Education and Director L. H. Bailey in arranging their work for the year 1910-1911. In 1911-1912 a regular course will be laid down for these students.

#### NEW YORK STATE TEACHERS CERTIFICATES

The New York State Education Department grants two kinds of certificates to college graduates.

1. The College Graduate Limited Certificate. This will be given at graduation. It is a license to teach in any school in the state except the primary and grammar grades of city schools and is good for two years. It will then be renewed if the holder shall pass state examinations in psychology, history of education, principles of education, and methods of teaching.

2. The College Graduate Professional Provisional Certificate. This is granted at graduation to students that have completed in the School of Education courses approved by the State Department. It is a license to teach for three years in any grade of any school in New York State, and may then be made permanent upon presentation of a certificate of three years' successful teaching.

The following studies are prescribed by the State Department for students that wish the professional certificate : psychology, general and educational, ninety hours ; history and principles of education, ninety hours ; methods in teaching, sixty hours ; observation, twenty hours.

This requirement may be met at present by completing the following courses : Philosophy 2 (psychology), Education 1, 2, 3, 4, 5.

1. PRINCIPLES OF EDUCATION. Second term, credit four hours. Prerequisite courses Philosophy 2, Education 4. Professor DEGARMO. M T W Th, 2, Goldwin Smith 234.

An introduction to the general theory of education, in both its individual and its social aspects. Social and individual bases of modern education ; basis for selection of studies ; fundamental differences between the sciences and the humanities ; function and worth of the various studies ; their organization into curricula ; vocational courses ; principles underlying scientific methodology, such as the acquisition of facts at first and at second hand, the use of problem, hypothesis, and analogy, explanation in the form of cause, classification or generalization, the inductive approach, the deductive approach, application, etc. Text-book, DeGarmo's Principles of Secondary Education, volumes I and II.



2. **PRESENT PROBLEMS IN EDUCATION.** Second term, credit one hour. F, 2, Goldwin Smith 234.

A course of lectures on important problems in education. They will be given partly by members of the Cornell University faculty and partly by invited guests.

3. **HISTORY OF EDUCATION.** First term, credit four hours. Prerequisite courses Philosophy 2, Education 4. Professor DEGARMO. M T W Th, 2, Goldwin Smith 234.

A general survey of the history of education. It will follow in the main the topics and readings prescribed in the syllabus of the New York State Education Department for the guidance of college graduates. Special emphasis is laid upon the following topics: the education of the Greek people; the rise and development of humanism; the rise and development of science and scientific methods in education; the doctrines of educational reformers; the development of modern systems of education. Monroe's Text-book in the History of Education.

4. **EDUCATIONAL PSYCHOLOGY.** Second term, credit four hours. Prerequisite course Philosophy 2. Assistant Professor WHIPPLE. M T W Th, 2, Goldwin Smith 256.

A complete system of functional psychology as applied to education, covering the relation of mental to nervous activity, and the large groups of psychophysical functions, volition, cognition, and emotion. Particular reference is given to such topics as nervous plasticity, habit, the nature of educational training and discipline, the psychology of temperament, attention and interest, association, apperception, perception, observation, memory, imagination, conception, judgment, and reasoning. Where feasible, psychological experiments that apply to the work in hand are described or performed. Whipple's Questions in General and Educational Psychology will be used.

5. **SCHOOL HYGIENE.** Second term, credit two hours. Assistant Professor WHIPPLE. M W, 3, Goldwin Smith 256.

Lectures, prescribed reading, and demonstrations.

Construction of school buildings, situation, heating, ventilation, sanitation, followed by the hygiene of instruction, fatigue, school diseases, defects of sight and hearing, medical inspection, hygiene of reading, writing and other studies. Occasional demonstrations of an experimental type. Whipple's Questions in School Hygiene will be used.

NOTE—Students that are particularly interested in this phase of the work and are competent for experimental investigation may register for systematic work in course 14. For this work students should have taken or be taking course 4, and should afterward take course 6.

6. **THE EDUCATION OF DEFECTIVES AND THE FEEBLE-MINDED.** First term, credit one hour. Prerequisite course 4. Assistant Professor WHIPPLE. Th, 2, (or hour to be arranged), Goldwin Smith 251.

Lectures, prescribed reading, and papers. An historical, statistical, and critical survey of the methods employed in the education of the blind, the deaf and dumb, the feeble-minded, and of abnormal and backward children generally.

Students will find it desirable also to take Education 5 and History and Political Science 57.

Given in alternate years.

7. **ELEMENTARY EDUCATION.** First term, credit two hours. Professor DEGARMO. W, 3-5, Goldwin Smith 251.

Designed for prospective principals, superintendents, and training-teachers in elementary education. Readings, reports, and round-table discussions on elementary studies and methods.

8. **MENTAL DEVELOPMENT.** First term, credit four hours. Prerequisite course 4, and preferably also 1 and 3. Assistant Professor WHIPPLE. M T W Th, 3, Goldwin Smith 227.

Lectures, readings, and essays. The genetic phases of mental life with special reference to their application to educational problems. The evolution of mind in the animal kingdom; childhood and the general results of child-study; and more fully, the period of adolescence. Heredity and environment, the nature and utilization of instinctive tendencies, the doctrine of recapitulation, the theory of culture of epochs, physical and mental changes of adolescence, the development of the sex instinct, the hygiene of sex, social organizations, the teaching of science in the high school, the problems of co-education, etc. The course is designed to be of assistance to high-school teachers.

9. THE TEACHING OF LANGUAGE. Second term, credit two hours. Professor BRISTOL. T Th, 12, Goldwin Smith 137.

An introduction to the study of language as speech, especially with reference to the description of foreign and native sounds. Consideration of the problems of teaching a foreign language; linguistic and literary aims in school work; principles of translating and of composition; the aims of foreign language study in secondary schools; discussions and practice exercises. For all seniors that are planning to teach foreign languages.

10. SCHOOL ADMINISTRATION. Second term, credit two hours. Professor DEGARMO. W, 3-5, Goldwin Smith 251.

Readings, discussions, and reports. The comparative study of school administration in American cities and in foreign countries, especially Germany and England.

Primarily for graduates.

11. PHILOSOPHY OF EDUCATION. Throughout the year, credit two hours a term. Professor DEGARMO. Th, 3-5, Goldwin Smith 251.

A course in advanced educational theory. It follows in the main Professor MacVannel's outline in the Philosophy of Education, and embraces such topics as the following: evolution and idealism as bases of education; personality and environment; the individual and society; moral institutions; democracy and education; the course of personal development; the school as a social institution; the course of study.

Primarily for graduates.

12. EXPERIMENTAL STUDY OF SCHOOL CHILDREN. First term, credit three hours. Prerequisite courses Philosophy 9, Education 4. Assistant Professor WHIPPLE. M T W, 2, Goldwin Smith 248.

A survey of the literature of physical and mental tests, particularly of tests of school children, with reference to purpose, methods, and results. Demonstrations of the more important tests and practice in their administration. The work is based upon Whipple's Manual of Physical and Mental Tests. Students that wish to undertake experimental problems may register in course 14.

Primarily for graduates.

13. ETHICAL TRAINING IN SECONDARY SCHOOLS. First term, credit two hours. Professor DEGARMO. F, 2-4, Goldwin Smith 251.

Readings, discussions, and reports. Regulative principles of conduct under static and under dynamic social conditions, the adolescent in modern society, moral habits, the function of interest in the moral life, the moral value of school studies, ethical training through athletics, etc.

Primarily for graduates.

14. SEMINARY FOR EXPERIMENTAL INVESTIGATION. Hours to be arranged. Prerequisite course 5 or 12. Assistant Professor WHIPPLE. Goldwin Smith 248.

Solution of minor problems in school hygiene or educational psychology, or of larger problems set as theses for advanced degrees.

Primarily for graduates.



15. SEMINARY FOR THE SCIENCE AND ART OF EDUCATION. Throughout the year, one hour a term. Prerequisite courses 1 or 3, and 4. Professor DEGARMO and Assistant Professor WHIPPLE. T, 7.30-9.30 p. m., Goldwin Smith 251.

Discussions, reports, and theses upon current educational problems, partly of a social and partly of a psychological nature. These reports and theses will involve study from original sources. Special theme for the first term, place and function of the several high school studies; for the second term, the psychology of learning. At each meeting a portion of the time will be given to reviews of important new books and of the current periodical literature, including especially *The Educational Review*, *The School Review*, *The Pedagogical Seminary*, *The Teachers College Record*, *The Elementary School Teacher*, and the more important European educational magazines.

## HISTORY AND POLITICAL SCIENCE

### ANCIENT HISTORY

1. ANCIENT HISTORY. First term, credit five hours for underclassmen, four hours for upperclassmen. Professor SILL. M T W Th F, 11, Goldwin Smith C.

Lectures, text-books, collateral reading, quizzes, and examinations. The history of the Mediterranean world from the beginnings of Greek civilization to the dissolution of the Roman Empire in the West.

2. ROMAN HISTORY: THE REVOLUTIONARY PERIOD. First term, credit three hours. Professor SILL. M W F, 9, Goldwin Smith 128.

Lectures, quizzes, reports, and examinations. The causes of the revolution; the democratic reformers; the senate and the capitalists; the collapse of the constitution; Julius Caesar; the triumvirate; the victory of Augustus; Roman life and literature during the revolutionary period.

3. THE ROMAN EMPIRE FROM AUGUSTUS TO JUSTINIAN. Second term, credit three hours. Professor SILL. M W, F, 9, Goldwin Smith 128.

Lectures, quizzes, reports, and examinations.

A history of the civilized world under the rule of Roman emperors. The foundation of the principate by Augustus; its development into a monarchy; organization and condition of the provinces; development of Roman law; early history of the Christian Church; disintegration of the Empire and decadence of ancient civilization.

4. GREEK POLITICS. Second term, credit three hours. Professor SILL. M W F, 11, Goldwin Smith 242.

Lectures, discussions, and reports. Greek public life and the political theories of Plato and Aristotle.

Not open to underclassmen.

5. SEMINARY IN GREEK AND ROMAN HISTORY. Throughout the year, credit two hours a term. Professor SILL. T, 4, or as may be arranged, Library, Greek and Latin Seminary Room.

The political career of Cicero, studied from the sources.

Open to graduates and to qualified undergraduates.

ORIENTAL HISTORY. See Semitics, courses 9a and 9b.

### MEDIEVAL HISTORY

11. THE MIDDLE AGES. First term, credit five hours. Professor BURR. M T W Th F, 3, Goldwin Smith 245.

A general survey of the history of Christendom from the eve of the Middle Ages to the dawn of the Renaissance (300-1300 A.D.), with especial attention to the life of society and the progress of civilization. Lectures and examinations.

12. **RENAISSANCE AND REFORMATION.** Second term, credit five hours. Prerequisite course 11 or the equivalent. Professor BURR. M T W Th F, 3, Goldwin Smith 245.

A study of the political, social, and religious history of Christendom during this age of transition (1300-1600 A. D.), with especial attention to the beginnings of modern life and thought. Lectures and examinations.

13. **THE RISE OF TOLERANCE.** Throughout the year, credit two hours a term. Prerequisite course 11 or the equivalent. Professor BURR. T Th, 12, Goldwin Smith 245.

A study of the history of intellectual and religious liberty in Christendom.

14. **MEDIEVAL LIFE.** First term, credit one hour. Prerequisite course 11. Professor BURR. S, 11, Library, European History Seminary Room.

The reading of some medieval historian, with a view to acquaintance with medieval life and facility in the use of historical Latin. In 1910-11 the subject of study will be the chronicle of John of Winterthur (Vitoduranus), 1273-1348. Not open to underclassmen. The course presupposes some knowledge of Latin—as much, for instance, as is needed to read Caesar or Livy.

15. **SEMINARY IN MEDIEVAL HISTORY.** Second term, credit one hour. Prerequisite course 11. Professor BURR. S, 11, Library, European History Seminary Room.

A research class for the critical study of some period, event, or phase of medieval history. In 1910-11 the topic will be: Church and State in the early fourteenth century. Open only to seniors and graduates. A reading knowledge of Latin is presupposed.

[16. **CANON LAW.** First term, credit two hours. Prerequisite courses 11, 12. Professor BURR.

The constitutional history of the Christian Church and the elements of ecclesiastical law.

Primarily for graduates].

Not given in 1910-11.

The attention of students especially interested in this period of history is also called to the courses in the early history of the modern languages and literatures and to the courses on the history of philosophy, morality, and ethics, especially to that on Thomas Aquinas (p. 26) and to that on the philosophy and culture of the Renaissance (p. 23).

#### MODERN EUROPEAN HISTORY

21. **ENGLISH HISTORY.** Second term, credit five hours for underclassmen, four hours for upperclassmen. Professor CATTERALL. M T W Th F, 11, Goldwin Smith C.

Lectures, text-books, collateral reading, quizzes, and examinations on the national development and the European relations of England, Scotland, and Ireland.

22. **MODERN EUROPEAN HISTORY, 1600-1815.** Throughout the year, credit three hours a term. Professor CATTERALL. M W F, 12, Goldwin Smith 242.

Lectures, with syllabus; quizzes, reports, and examinations.

Open only to upperclassmen.

23. **ENGLISH CONSTITUTIONAL HISTORY.** Throughout the year, credit three hours a term. Professor CATTERALL. M W F, 9, Goldwin Smith 242.

Lectures, text-books, quizzes, reports, and examinations. This course will cover the entire period of English history, beginning with Anglo-Saxon institutions. The political history will be given only in so far as its understanding is necessary to the study of political events.



25. HISTORY OF ITALY IN THE NINETEENTH CENTURY. First term, credit three hours. Professor CATTERALL. M W F, 11, Goldwin Smith 242.

Lectures, quizzes, reports, and examinations. The course will begin with the settlement of Italy at the Congress of Vienna, and will take up the principal events by which Italy became a united nation.

Open to graduates and, by permission, to qualified seniors.

26. SEMINARY IN EUROPEAN HISTORY. Throughout the year, credit two hours a term. Professor CATTERALL. M, 4-6, Library, European History Seminary Room.

Open to graduates and, by permission, to qualified seniors.

#### AMERICAN HISTORY

32. AMERICAN HISTORY FROM 1750 TO 1815. First term, credit three hours. Professor HULL. M W F, 10, Goldwin Smith C.

The revolutionary period and the establishment of independence: the decline of European influence in the affairs of the time. Reference readings, text-books, and lectures.

33. AMERICAN HISTORY FROM 1815 TO 1892. Second term, credit three hours. Professor BRETZ. M W F, 10, Goldwin Smith C.

The period of national expansion: the rise and solution of sectional questions, and recent developments. Reference readings, text-books, and lectures.

34. ECONOMIC HISTORY OF THE COLONIES, 1600 to 1788. First term, credit two hours. Professor HULL. T Th, 9, Goldwin Smith 234.

Colonization and settlement as business enterprises, the agricultural conquest of the coast; the competition between slave, indentured, and free labor; the commerce of the British Empire and its relation to the American Revolution. Text-book, readings, reports, and lectures.

35. ECONOMIC HISTORY OF THE UNITED STATES, 1789-1890. Second term, credit two hours. Professor HULL. T Th, 9, Goldwin Smith 234.

Commerce during the European wars; the introduction of manufactures; the westward movement; industrial differentiation of the sections; agriculture for export; the amalgamation of railways and the combination of industries. Text-books, readings, reports, and lectures.

36. CONSTITUTIONAL HISTORY OF THE UNITED STATES, 1860-1877. First term, credit three hours. Prerequisite courses 32 and 33 or the equivalent. Professor BRETZ. M W F, 9, Goldwin Smith 234.

Readings, discussions, and reports.

37. CONSTITUTIONAL HISTORY OF THE UNITED STATES SINCE 1877. Second term, credit three hours. Prerequisite courses 32 and 33 or the equivalent. Professor BRETZ. M W F, 9, Goldwin Smith 234.

Readings, discussions, and reports.

38. THE JEFFERSONIAN SYSTEM. Second term, credit three hours. Prerequisite courses 32 and 33, or the equivalent. Professor HULL. M W F, 10, Goldwin Smith 236.

A more detailed study of the period from 1800 to 1815. Henry Adams's History of the United States will be critically read by the class and illustrated by collateral readings, reports, and lectures.

39. AMERICAN SOCIAL HISTORY: THE SETTLEMENT OF THE MIDDLE WEST. First term, credit three hours. Professor BRETZ. M W F, 10, Goldwin Smith 236.

The early settlers in the Ohio Valley, the growth of states, the disposal of the public lands, and the development of commerce and industry.

Primarily for graduates. Open by permission to qualified upperclassmen.

40. SEMINARY. Throughout the year, credit two hours a term. Professors HULL and BRETZ. First meeting, Thursday, October 6, 4 p.m., Library, American History Seminary Room.

### HISTORY IN GENERAL

[41. THE SCIENCES AUXILIARY TO HISTORY. First term, credit two hours. Professor BURR.

A glance at the aims, the methods, the literature, and the use to history of the more important auxiliary sciences—anthropology, ethnology, archaeology, philology, epigraphy, paleography, diplomatics, sphragistics, numismatics, heraldry, genealogy, chronology, geography. Not open to underclassmen.]

Not given in 1910-11.

42. HISTORICAL GEOGRAPHY. Throughout the year, credit one hour a term. Professor BURR. S, 10, Library, European History Seminary Room.

A thorough study, with map and text, of the geography of history. Not open to underclassmen, and intended for those who have given much attention to history. As the order of topics is not of moment, the course may be begun with either the first or the second term.

43. PALEOGRAPHY AND DIPLOMATICS. Throughout the year, credit one hour a term. Professor BURR. S, 12, Library, European History Seminary Room.

The reading of manuscripts and the interpretation of documents. Attention is devoted chiefly to the paleography of Latin and of the languages using the Latin alphabet (e. g., English, French, German, Italian). The course is an actual study of the manuscripts and facsimiles in which the University is rich.

44. INTRODUCTION TO THE LITERATURE OF HISTORY. Throughout the year, credit one hour a term. Professors SILL, SCHMIDT, BURR, CATTERALL, HULL. F, 3, or other hour to be arranged. First meeting, Friday, Oct. 7, Library, European History Seminary Room.

A general survey, period by period, of the sources and literature of history. For graduates only.

45. HISTORICAL METHOD. First term, credit two hours. Professor BURR. W, 4-6, Library, European History Seminary Room.

History: its nature, its scope, its materials, its methods. Open only to seniors and graduates, and intended especially for those who are looking forward to the teaching of history or to historical research.

### COURSE FOR TEACHERS

46. THE TEACHING OF HISTORY. Second term, credit two hours. Professor BURR with aid from his colleagues. W, 4-6, Library, European History Seminary Room.

Open only to seniors and graduates who are specializing in history.

### POLITICAL SCIENCE

51. ELEMENTARY ECONOMICS. Throughout the year, credit three hours a term. Professor WILLCOX and Messrs. LAGERQUIST, TURNER, SABY, and ——. Lecture M, 11, Sibley Dome; class room work in fifteen sections at following hours: W F, 10, 11, 12; T Th, 8, 10, 11, 12.

For those who wish a general introduction to economics or a preparation for pursuing further studies in any department of political science. One lecture each week and two hours of class-room discussion of text-books and assigned questions or supplementary reading. For section assignments and other information apply at Goldwin Smith 260.



53a. **POLITICAL INSTITUTIONS.** First term, credit three hours. Acting Professor GLASSON and Mr. SMITH. Lectures, text-book, and discussions, M W, 10, Goldwin Smith 256; library and text book work to be arranged.

The principles of politics; nature and historical development of political institutions; outline of the constitutional and administrative laws of the United States and of Great Britain with special reference to their practical working.

53b. **COMPARATIVE POLITICS.** Second term, credit three hours. Acting Professor GLASSON and Mr. SMITH. Lectures, text-book, and discussions, M W, 10, Goldwin Smith 256; library and text book work two hours a week to be arranged.

Sketch of the constitutional and administrative laws and of the political institutions of the leading nations of continental Europe, with special reference to their relations to present political problems in the United States. A continuation of course 53a, and preferably to be taken after that, though it may be elected independently.

[55. **ELEMENTARY SOCIAL SCIENCE.** Throughout the year, credit three hours a term. Course 37 should precede or be taken with this. Professor WILLCOX.

An introductory course on the non economic aspects of certain social problems, such as the family, race relations, immigration, labor questions, and crime.]

Not given in 1910-11.

57. **METHODS OF MODERN PHILANTHROPY; CRIMINOLOGY AND SOCIAL PROGRESS.** Throughout the year, credit three hours a term. Professor FETTER. Lectures, T Th, 11, and laboratory S, by appointment, Goldwin Smith 264.

First term, problems of charities: the pauper, the feeble-minded, the insane, and dependent children, and the best methods of dealing with them. Second term, problems of crime: the criminal, jails, prisons, reformatories, and preventive and educational measures now developing for the betterment of social conditions. Visits to institutions in the neighborhood.

(Seniors may take one or two additional hours by registering in course 98).

58. **CORPORATION ECONOMICS.** Throughout the year, credit two hours a term. Prerequisite course 51. Acting Professor GLASSON. M W, 12, Goldwin Smith 256.

(1). The principles of modern business organization. Evolution of the corporation; its advantages and disadvantages from the economic and legal points of view; methods of promotion and organization; corporate stock, bonds, and other securities; the sale and underwriting of securities; systems of corporation management; dissolution of corporations, insolvency, receiverships, and reorganization of corporations.

(2). Corporate combinations and consolidations. The promotion, financing, and organization of combinations; advantages and disadvantages of combination; the influence of combinations upon wages and labor conditions; the influence of combinations upon prices; the relations of combinations to their security holders; other social effects of combinations; the public regulation and control of combinations.

[60. **MODERN QUESTIONS IN INTERNATIONAL POLITICS.** Throughout the year, credit two hours a term. Professor JENKS.

A study of leading questions of the day in the field of international politics. The purpose of the course is not only to give general information but also to show the practical application to the study of current events of the principles of international law and politics.]

Not given in 1910-11.

61. VOCATIONAL TRAINING AND PRACTICE. Throughout the year, credit two hours a term. Open to students that have had course 51 and to others by special permission. Dr. GERTRUDE MARTIN. T Th, 10, Goldwin Smith 256.

A discussion of the development and essential nature of business, the personal qualities required for the various trades and professions, and the training needed to fit the student for his chosen life work. Emphasis will be laid upon the personal attitude to be taken in choosing a vocation, and especially upon the new vocations suitable for women.

[62. PRINCIPLES OF BUSINESS MANAGEMENT. Throughout the year, credit two hours a term. Professor JENKS.

A discussion of the methods employed in organizing and financing modern business institutions and especially of the general methods of management,—cost-keeping, price making, advertising, selling, buying, correspondence, shipping, relations with laborers, with the stock market, with the public, and similar topics as viewed from the standpoint of the business managers of large enterprises. The main purpose of the course is to note the way in which the general principles of economics are seen and applied in actual business life.]

Not given in 1910-11.

64. MONEY, CREDIT, AND BANKING. Throughout the year, credit four hours; without laboratory work, three hours a term. Prerequisite course 51. Course 68 is recommended, though not required, as a preliminary course. Professor KEMMERER. T Th S, 10, and two laboratory hours to be arranged, Goldwin Smith 264.

The work of this course will be divided into three parts: (a) a study of the principles of money, credit, and banking; (b) a study of the exemplification of those principles in the monetary and banking history of certain countries; (c) a study of present day currency and banking problems in the United States. Lectures, discussions, and laboratory work.

66a. LABOR'S PROBLEMS AND PROGRESS. First term, credit three hours. Prerequisite course 51. Professor FETTER. M W F, 11, Goldwin Smith 264.

Progress of the workers in Europe and America, conditions, wages, hours, methods of remuneration, plans for the betterment of factories and homes, influence of labor unions on wages, on industry, and on national life. Not open to underclassmen.

66b. SOCIAL REFORMS AND PROJECTS. Second term, credit three hours. Prerequisite course 51. Professor FETTER. M W F, 11, Goldwin Smith 264.

History and growth of the more radical modern plans for changing industrial conditions; program and spirit of the socialistic parties in Europe and America.

67. ECONOMIC HISTORY OF ENGLAND SINCE 1750. Throughout the year, credit three hours a term. Prerequisite course 51. DR. USHER. M W F, 12, Goldwin Smith 264.

The industrial and agrarian revolutions beginning in 1750; earlier development of agriculture; the great inventions; rise of the factory system; poor relief; growth of English trade; governmental interference and socialistic legislation; Germany vs. England; the future of England's industrial supremacy.

68. FINANCIAL HISTORY OF THE UNITED STATES. Second term, credit three hours. Prerequisite course 51. Professor KEMMERER. M W F, 9, Goldwin Smith 269.

An historical study of public revenues and expenditures, of public debts, and of currency and banking in the United States, during the national period. This course is preliminary to courses 64 and 70 and is recommended to all students that intend to take either of these courses.



70. PUBLIC FINANCE. Throughout the year, credit two hours a term. Prerequisite course 51. Course 68 is recommended, though not required, as a preliminary course. Professor KEMMERER. T Th, 11, Goldwin Smith 269.

A study of the principles of government revenue, government expenditure, and government debt, with particular reference to present day problems of taxation in the United States.

[71. RAILWAY TRANSPORTATION. First term, credit three hours. Prerequisite course 51. Dr. BAUER.

The history of railway development in the United States; description of railway service and its organization; the nature of railway competition; principles of rate making; discrimination, combination, and consolidation; railway legislation and the question of government control.]

Not given in 1910-11.

72. SCIENCE OF ACCOUNTS. First term, credit three hours. Prerequisite course 51. Dr. BAUER. T Th S, 9, Goldwin Smith 264.

The principles of double-entry book-keeping; the nature of capital, expense, and depreciation and income accounts; the balance sheet, with principles underlying the valuation of the several items; stocks and bonds, with basis of their issue, and treatment in the accounts; earnings and dividends, how determined, and how treated in the accounts; cost accounting, its principles, and its importance in modern business; legal regulation of accounting practice.

73. INSURANCE. Second term, credit two hours. Prerequisite course 51. Dr. BAUER. T Th, 9, Goldwin Smith 264.

(a) Life insurance; its purpose, importance, and history; the construction of mortality tables; the calculation of net premiums; the reserve; loading; policies and policy conditions; organization of the business; investments; taxation and legal regulation. (b) Fire insurance; its purpose and importance in modern business; fire hazards; the principles and difficulties of fire rating; rate-discriminations; the business organization; current fire insurance problems. (c) Three or four general lectures on marine and industrial insurance.

73b. INVESTMENTS. Second term, credit two hours. Prerequisite course 51. Mr. LAGERQUIST. W F, 10, Goldwin Smith.

Lectures, readings, and special assignments. The nature, principles, and methods of investment; the relation of speculation to investment; the relative merits, as investments, of stocks and bonds (industrial, railway, and mining), of farm mortgages, of municipal bonds, and of street railway, gas, and water securities.

74a. MUNICIPAL GOVERNMENT IN EUROPE. First term, credit two hours. Mr. SMITH. T Th, 8, Goldwin Smith 256.

Lectures, discussions, and assigned readings on the governmental, financial, and social problems presented by the modern city. Students will be required to investigate and report on municipal conditions in special states of Europe.

74b. MUNICIPAL GOVERNMENT IN THE UNITED STATES. Second term, credit two hours. Mr. SMITH. T Th, 8, Goldwin Smith 256.

Lectures, discussions, and assigned readings on the governmental, financial, and social problems presented by the modern city. Students will be required to investigate and report on municipal conditions in specified cities of this country.

75. INTERNATIONAL LAW. Throughout the year, credit two hours a term. Mr. SABY. T Th, 12, Goldwin Smith 256.

The nature and development of international law. The rights and obligations of nations in time of peace, with special reference to independence,

jurisdiction, and diplomacy. The laws of war and neutrality. America's contributions to international law. The arbitration movement. Text book, cases, assigned readings, and reports.

76a. DEMOGRAPHY OR POPULATION STATISTICS. First term, credit three hours. Professor WILLCOX and Mr. ——. Lectures M W F, 9, Goldwin Smith 256; laboratory W, 2-4 (or other hours to be arranged).

An introduction to census statistics and vital statistics with practical work in investigation, tabulation, and interpretation. The course presents statistics as a scientific basis for public health and preventive medicine and also as a method applicable far more widely than this, its oldest and best developed field.

76b. ECONOMIC STATISTICS. Second term, credit three hours. Professor WILLCOX and Mr. ——. Lectures M W F, 9, Goldwin Smith 256; laboratory W, 2-4 (or other hours to be arranged).

A continuation of course 76a and dealing mainly with the agricultural and industrial statistics of the United States. Mature students that have not already had course 76a or its equivalent may be admitted by special permission. The course is an introduction to statistics in its application to more difficult fields, such as production, wages, prices, and index numbers.

77. ADVANCED STATISTICS. Throughout the year, credit three hours a term. Prerequisite courses 51, 76a, 76b, or the equivalent. Professor WILLCOX. T Th S, 9, Goldwin Smith 259.

The course will present the main results of Professor von Mayr's Statistik und Gesellschaftslehre as far as the work has been published, namely, volumes 1, 2, and part 1 of volume 3, and will consider their significance for the United States. Some knowledge of German is presupposed and some practice in reading German will be secured.

Primarily for graduates.

79. COMMERCE AND COMMERCIAL POLICIES. Throughout the year, credit two hours a term. Mr. LAGERQUIST. T Th, 10, Goldwin Smith 256. The history of commerce; the theory of international trade, medieval and modern, with the economic background of each; relation of money and credit to exchange; commercial policies, protection and free trade, tariff history, commercial treaties and reciprocity, customs administration; legal aspects of the regulation of commerce in the United States; commercial institutions, public and private, the consular service, the use of government statistics and reports. Lectures and discussions.

80. THE MODERN THEORY OF DISTRIBUTION. Throughout the year, credit two hours a term. Professor FETTER. M W, 8, Goldwin Smith 264.

A study of the most notable recent writings and contributions in systematic economics and of the methods of the modern critical school, to secure a deeper insight into the practical reformatory measures of the day. Special subject for 1910-11: the law of diminishing returns.

Primarily for graduates. Open also to qualified seniors.

[82. THE PRINCIPLES OF POLITICS. Throughout the year, credit two hours a term. Professor JENKS.

An advanced course in the fundamental principles of politics. In this course a few fundamental questions will be studied covering the nature of society and its principles of organization and especially the nature of the state, its functions, and the principles of its practical organization.

Primarily for graduates ]

Not given in 1910-11.

85. PROBLEMS OF RACE AND INDUSTRY IN THE SOUTH. Throughout the year, credit two hours a term. Acting Professor GLASSON. T, 4-6.

The political, economic, and general social problems arising out of the presence of the negro race in the South; a study of some of the problems of agricultural and manufacturing industry in the South.

Open to graduates and qualified undergraduates.



89. CURRENCY AND BANKING REFORM IN THE UNITED STATES. Throughout the year. Prerequisite courses 51 and 64 or the equivalent. Professor KEMMERER. Hours to be arranged, Library, Political Science Seminary.

This course in 1910 and 1911 will be devoted to a study of proposals for a central bank in the United States. Special attention will be paid to the lessons afforded by European experience.

Primarily for graduates.

90. RESEARCH IN LABOR PROBLEMS. Throughout the year, one to three hours a term. Professor FETTER. At hours to be determined. Goldwin Smith, 269.

Advanced research work in connection with the laboratory exercises of course 66a.

92. RESEARCH IN FINANCE. Throughout the year, credit two or three hours a term. Prerequisite courses 51 and either 64 or 70 or other advanced work in finance. Professor KEMMERER. Hours and place to be arranged.

94. RESEARCH IN POLITICS AND IN THE ECONOMIC HISTORY OF THE UNITED STATES. Throughout the year, credit one to three hours a term. Acting Professor GLASSON. Hours to be arranged.

A few specially prepared students, primarily graduates, may undertake studies involving original investigation in the fields mentioned.

98. RESEARCH IN PHILANTHROPY. Throughout the year, one to three hours a term. Professor FETTER. Hours to be arranged, Goldwin Smith 269.

For students that are doing special work in vocational philanthropy. Studies in the history and statistics of charities and criminology in connection with the laboratory exercises of course 57.

99. GENERAL SEMINARY. Throughout the year, credit two hours a term. Professors WILLCOX, FETTER, KEMMERER, and GLASSON. M, 2.30-4.30, Goldwin Smith 236.

For research work in the field of political science. Open only to graduate students.

ECONOMICS OF AGRICULTURE. Professor LAUMAN. M W F, 9.

See College of Agriculture, Rural Economy, course 4.

CONSERVATION. Professor LAUMAN. M W F, 11.

See College of Agriculture, Rural Economy, course 7.

## BIBLIOGRAPHY

1. INTRODUCTION TO THE USE OF BOOKS. First term, credit one hour. Assistant Librarian AUSTEN. T, 4, Library Lecture Room.

A systematic study of bibliographies, indexes, dictionaries, cyclopedias, etc., including the principles of classification, cataloguing, indexing, and preparing manuscript for printing. Lectures and exercises.

1a LABORATORY WORK. Second term, credit one hour. Assistant Librarian AUSTEN. T, 4, Library Lecture Room.

Laboratory work covering the subjects of course 1, and intended for students that wish more of the practical work.

2. GENERAL BIBLIOGRAPHY. Second term, credit two hours. Librarian HARRIS. T Th, 12, Library Lecture Room.

The materials and form of books in ancient times; books in the Middle Ages, block books, early printed books, illustrated by examples of manuscript and incunabula; book illustration, book-bindings; form-notation; systems of classification and cataloguing; general bibliographical aids. Lectures and reference readings.

## MUSIC

The several courses offered by the Department of Music are designed to afford to all students having sufficient native ability, the opportunity to study music as a part of or in addition to the regular college course. The aim is to make musical training contribute to liberal culture. Consequently, attention is mainly directed to practical courses, or courses in so called applied music. All instruction is given in classes.

For students entering college without musical training, the department offers elementary instruction in ear training, sight-reading, musical notation and terminology, harmony and composition, and elements of musical form, which, for performer and for listener, constitute a necessary basis for the proper understanding of the musical literature to be studied.

The department also provides a weekly organ recital, a musical program for the vesper service at Sage Chapel on Sunday afternoons, a course of lectures, a series of chamber concerts, and an elaborate Music Festival, which is given annually about the first of May.

All courses continue through both terms and students are not admitted at the beginning of the second term, with the exception of those who, at entrance, pass the required work of the first term.

1. **ELEMENTARY.** Open to all students showing sufficient aptitude to pursue the subject with profit.

Throughout the year, credit two hours a term. Professor DANN. T, 7.15 p. m., Th, 4.45, Sage Chapel.

A thorough course in sight-reading, ear and vocal training, and elementary theory, including a practical knowledge of the major and minor scales. Attendance is required at the morning service at Sage Chapel, for which service the members of this class form a part of the choir.

3. **INTERMEDIATE.** Open to students who have completed course 1 or who meet the requirements prescribed in course 1. Throughout the year, credit two hours a term. Professor DANN. W, 4.45; Th, 7.15 p. m., Sage Chapel.

Ear and vocal training, theory, including the study of intervals, triads, music notation and terminology, and the elements of musical form; more advanced sight reading and the study of standard sacred and secular music; the study through the aid of the piano player and the phonograph, of prescribed works selected from the larger compositions. Attendance is required at the morning service at Sage Chapel, for which service the members of the class constitute the regular choir.

4. **CHORAL.** Open to students possessing singing voices of sufficient volume and satisfactory quality, and the ability to read or learn their part in the more difficult choral works. Throughout the year, credit one hour a term. Professor DANN. Until December 1, M, 4.45, Sage Chapel; thereafter, 7.30 p. m., Stimson Hall.

Advanced sight reading and vocal training, preparatory for and including the study and performance of the larger choral masterpieces. Members of this class form a part of the Festival Chorus.

5. **ADVANCED CHORAL.** Throughout the year, credit two hours a term. Professor DANN, M, 7.15; T, 4.45, Sage Chapel.

Preparation and public presentation of the best choral works, sacred and secular. This course is offered as advanced work to students possessing good singing voices and the ability to read at sight music of moderate difficulty. The class is limited to one hundred, distributed approximately as follows: thirty sopranos, twenty-two contraltos, twenty tenors, and twenty-eight basses. All vacancies are filled by competition at the beginning of the first term. Students who have completed course 3 are admitted without examination.



Members of this class constitute the choir at the Sunday Vesper Service at Sage Chapel. They also form a part of the Festival Chorus, studying the larger choral works to be performed at the Annual Music Festival.

6. ORCHESTRA. Only a limited number can be admitted. Vacancies will be filled by competition. Throughout the year, credit two hours a term. Mr. COLEMAN. T Th S, Barnes Hall.

Ensemble study of standard works, including compositions for chorus and orchestra. This course is offered as advanced training for students who play some orchestral instrument sufficiently well to participate creditably in the study and performance of the works to be studied. The orchestra will give several concerts during the year, accompany the advanced choir at the Sunday Vesper Service at Sage Chapel, and participate in the performance of complete works given by the choir during the year.

7. HARMONY. Open to all students who have completed course 2 or who have done the work prescribed in course 2. Throughout the year, credit two hours a term. Mr. JOHNSTON. T Th, Sage Chapel.

The subject is approached through a course in melody writing. The work requires a thorough knowledge of the major and minor scales and involves the study of intervals, the construction, relation, and progression of chords, and the harmonization of melodies.

8. ADVANCED HARMONY AND COMPOSITION. Open to students who have completed course 6, and to others equally qualified. Throughout the year, credit two hours a term. Mr. JOHNSTON. M W, 3.30, Sage Chapel.

This course is concerned with the analysis of form and with counterpoint in three or more parts.

Individual examinations for admission to all courses, for new students and others not previously classified, will be held as follows:

Vocal Music. Courses 1, 2, 4, and 5, Wednesday, September 28; Thursday, September 29; Friday, September 30, and Saturday, October 1 from 3 to 5, Sage Chapel.

Orchestra. Course 6, Thursday, September 29, and Friday, September 30, from 5 to 6, Barnes Hall (West Dome).

Harmony. Courses 7 and 8, Thursday, September 29, and Friday, September 30, from 5 to 6, Sage Chapel.

## MATHEMATICS

1. ANALYTIC GEOMETRY AND CALCULUS. Twenty-four sections, daily except S, first term; daily, second term.

1a. Analytic Geometry. Credit four hours first term.

1b. Differential Calculus. Credit one hour first term, two hours second term.

1c. Integral Calculus. Credit four hours second term.

2a. ANALYTIC GEOMETRY AND DIFFERENTIAL CALCULUS. Second term, credit six hours.

Sec. 1. Daily 9, White 10. Professor McMAHON.

Sec. 2. Daily 11, White 21. Assistant Professor CARVER.

2b. INTEGRAL CALCULUS. First term, credit three hours. Prerequisite courses 1a and 1b, or the equivalent. Professor HUTCHINSON. M W F, 8, White 25.

This course covers substantially the work of course 1c.

3. ANALYTIC GEOMETRY AND CALCULUS. Throughout the year, credit five hours a term.

3a. Analytic Geometry. Credit, four hours first term.

3b. Differential Calculus. Credit, one hour first term, two hours second term.

3c. Integral Calculus. Credit, three hours second term.

Sec. 1. Daily except S, 10, White 24. Professor TANNER.

Sec. 2. Daily except S, 8, White 6. Professor SNYDER.

Recommended for students intending to specialize in physics or chemistry.

4. ADVANCED ALGEBRA. Repeated in second term, credit five hours.

Sec. 1. Daily except S, 9, White 24. Professor TANNER.

Sec. 2. Daily except S, 10, White 6. Professor SNYDER.

Open to all students, but designed especially for those who have entered with the minor requirements in mathematics and are preparing: (1) to teach mathematics in the secondary schools; (2) to take up engineering work later in the course; (3) to specialize in chemistry or physics.

6. SOLID GEOMETRY. Repeated in second term, credit three hours.

First term.

Sec. 1, M W F, 9, Mr. SILVERMAN.

Sec. 2, T Th S, 10, Mr. MILES.

Second term, T Th S, 9, Dr. OWENS.

Open to all students, but designed especially for those mentioned under course 4.

7. PLANE AND SPHERICAL TRIGONOMETRY. Repeated in second term, credit three hours.

First term.

Sec. 1, T Th S, 9, White 1. Dr. CRAIG.

Sec. 2, M W F, 10, White. Dr. OWENS.

Second term, M W F, 9, Mr. SILVERMAN.

Open to all students, but designed especially for those mentioned under course 4.

[10. TEACHERS COURSE. Throughout the year, credit three hours a term. Professor TANNER and Dr. OWENS.

First term, algebra and trigonometry. Selected topics considered historically and critically.

Second term, geometry. An analysis of the fundamental basis of logical geometry together with a critical review of the whole subject.

Designed primarily for those students who are preparing to teach mathematics in the secondary schools.] Not given in 1910-11.

11. DIFFERENTIAL EQUATIONS. Throughout the year, credit two hours a term. Prerequisite course 3 or the equivalent. Dr. OWENS. M W, 9, White.

An elementary course including the solution of the simpler types of ordinary and partial differential equations. The statement of physical problems in the form of differential equations and the applications of boundary conditions to the solutions found.

12. APPLIED MATHEMATICS. Throughout the year, credit two hours a term. Prerequisite course 1 and some knowledge of mechanics and differential equations. Dr. CRAIG. White 1.

An elementary study of some of the more important functions connected with the differential equations of mathematical physics, including graphical representation and processes of numerical approximation.

13. DESCRIPTIVE AND PROJECTIVE GEOMETRY. Throughout the year, credit three hours a term. Professor SNYDER. T Th S, 9, White 6.

Designed to familiarize the student with reasoning about geometric forms. Ordinary problems of descriptive geometry and their application to synthetic and general projective geometry.

14. THEORY OF PROBABILITIES. Throughout the year, credit two hours a term. Professor MCMAHON. White 10.

Theory of probabilities with applications to insurance and sociology. Fitting of approximation curves to statistical data and investment rates.



15. **ADVANCED ANALYTIC GEOMETRY.** Throughout the year, credit three hours a term. Prerequisite course 1. Dr. MCKELVEY. White.

An introduction to the theory of algebraic curves and surfaces. Systems of coordinates, elementary transformations, polar systems, a summary of unicursal curves and of the theory of quadric surfaces.

16. **THEORY OF EQUATIONS.** Throughout the year, credit two hours a term. Professor TANNER. White 24.

Symmetric functions, transformations and general properties of equations; numerical algebraic and transcendental equations; general theory of elimination; determinants.

17. **ADVANCED CALCULUS.** Throughout the year, credit three hours a term. Prerequisite course 1. Assistant Professor CARVER. White 21.

The usual topics, and a study of the essential nature of the problems of the differential and integral calculus and of the limitations within which the processes may be applied.

[18. **INFINITE SERIES AND PRODUCTS**].

Not given in 1910-11.

[19. **ALGEBRAIC CURVES.** Throughout the year, credit three hours a term. Prerequisite courses 1, 13, 15. Professor SNYDER. White].

Not given in 1910-11.

19b. **BIRATIONAL TRANSFORMATIONS.** First term, credit two hours. Prerequisite course 19. Professor SNYDER. White 6.

A general introduction to Riemann transformations of algebraic curves from the Brill-Noether standpoint.

Primarily for graduates.

21. **PARTIAL DIFFERENTIAL EQUATIONS.** Throughout the year, credit two hours a term. Mr. MILES. White.

A general discussion of the theory; various applications to geometry and to mathematical physics.

22. **THEORY OF GROUPS.** Throughout the year, credit two hours a term. Assistant Professor RANUM. White 9.

The fundamental principles of the theory of abstract groups of finite order; permutation and linear groups; the Galois theory of algebraic equations.

[23. **THEORY OF NUMBERS**].

Not given in 1910-11.

24. **DIFFERENTIAL GEOMETRY.** First term, credit three hours. Dr. GILLESPIE. White 5.

An elementary course in the applications of the calculus to the geometry of surfaces. Applicability and systems of curves on surfaces, in particular, asymptotic lines, lines of curvature, geodesics, and isothermals.

25. **THEORY OF FUNCTIONS OF A COMPLEX VARIABLE.** Throughout the year, credit three hours a term. Professor HUTCHINSON. White 25.

A general course in the theory of functions with especial attention to uniform and algebraic functions, and conformal representation; some of the elementary properties of functions of several variables will also be considered.

27. **ALGEBRA OF LOGIC.** First term, credit three hours. Mr. SILVERMAN. White.

Boole's Laws of Thought; recent developments of Veun, Schröder, and Peano; Russell's Principles of Mathematics. No previous technical knowledge of mathematics presupposed. Open to students of mathematics or of philosophy.

28. CALCULUS OF VARIATIONS. Throughout the year, credit two hours a term. Mr. HURWITZ. White.

The treatment of the case in which the integrand contains one unknown function, and its first derivative, and one independent variable. An introduction to mechanics from the standpoint of the calculus of variations.

29. ELEMENTARY MECHANICS. Throughout the year, credit two hours a term. Assistant Professor SHARPE. White 27.

A simple exposition of the fundamental principles of the subject. Designed for students that do not intend to specialize in mathematics or in physics.

30. VECTOR ANALYSIS. Throughout the year, credit two hours a term. Professor McMAHON. White 10.

Classification of vector fields; illustrations and properties of the principal fields; applications to electric fields.

[42. ADVANCED MATHEMATICAL PHYSICS.]

Not given in 1910-1911.

## ASTRONOMY

1. GENERAL ASTRONOMY. First term, credit three hours. No prerequisite, but a knowledge of elementary physics is desirable. Lectures and recitations illustrated with lantern slides and the observatory equipment. Assistant Professor LELAND. M W F, 12, Rockefeller C.

A fundamental course in descriptive astronomy including a comprehensive study of the structure of the universe and the heavenly bodies, their motions, relations, and evolutions; methods of investigation; instruments and apparatus.

2. OBSERVATIONS. Second term, credit one hour. Prerequisite course 1. Assistant Professor LELAND. One evening a week to be arranged. Fuertes Observatory.

A general study of the constellations, the sun and the planets, double and multiple stars, and nebulae. Star-maps and catalogues, field glasses, and the equatorial telescope.

## PHYSICS

1. INTRODUCTORY EXPERIMENTAL PHYSICS. Repeated in second term, credit four hours. Professors NICHOLS, MERRITT, and SHEARER. M T W Th, First term 9 or 12, second term 12, Rockefeller A.

Entrance physics is not accepted as an equivalent for this course.

5. INTRODUCTORY PHYSICS. Class room work. Repeated in second term, credit two hours. Messrs. GIBBS, HOWE, MURDOCK, FORMAN, and ZELLER. M W, or T Th, Rockefeller, to be assigned.

6. INTRODUCTORY PHYSICS. Class room work. Repeated in second term, credit four hours. Messrs. GIBBS, SOMERVILLE, MURDOCK, and FORMAN. M T W Th, Rockefeller, as assigned.

Examinations for those who were unavoidably absent from either term examination in courses 1, 5, or 6, and for those who have conditions to make up, will be held on registration day, September 29, 1910, at 2 p. m.

8. GENERAL PHYSICS. Theory. Repeated in second term, credit two hours. Prerequisite courses 1 and 5 and Mathematics 1. Messrs. FISHER, GALAJIKIAN, MOLBY, RICHTMYER, RODGERS, TAYLOR, GOLDBERG, HARRINGTON, and WING. Two days as assigned, Rockefeller, as assigned.

Text-book work in statics, dynamics, properties of matter, and heat, including thermometry, expansion, calorimetry, radiation and conduction. Two hours of course 14 must be taken in connection with course 8.



9. GENERAL PHYSICS. Theory. Repeated in second term, credit two hours. Prerequisite courses 8 and the first term of 14. Instructing staff as in course 8. Two days as assigned, Rockefeller as assigned.

Text-book work. A continuation of course 8. Magnetism and electricity, properties of vapors, and an introduction to the kinetic theory of gases and thermodynamics.

Two hours of course 14 must be taken in connection with course 9.

10. INTRODUCTORY PHYSICAL EXPERIMENTS. Either term or throughout the year, credit one to four hours a term. Especially for students taking 1 and 6, but open to those who are taking or have completed 1, 1 and 5, 6, or the equivalent. Assistant Professor BLAKER and Messrs. DORSEY, RODGERS, AND MAYER. M W S, 8-10.30, M T W Th F, 2-4.30. Rockefeller 220-232.

A shorter course of two hours covering properties of matter, heat, light, sound, magnetism, and electricity may be taken for one term, the student electing two laboratory periods a week, or the course may be extended over a year, one period a week being taken. A longer course of three or four hours may be elected covering the same ground as the two hour course but more in detail, the work being done in one term or distributed over two terms.

14. PHYSICAL EXPERIMENTS. Either term or throughout the year, credit one to eight hours a term. Prerequisite courses 1 and 6, or 1 and the two hour course in 10, or the equivalent. May be taken by students that are taking courses 8 and 9. Assistant Professor BLAKER, and Messrs. RICHTMYER, FISHER, DORSEY, GALAJIKIAN, MOLBY, RODGERS, TAYLOR, GOLDBERG, HARRINGTON, AND WING. M T Th, 9-12, W S, 8-11, M T W Th F, 2-5. Rockefeller 250-257.

Physical measurements, properties of matter, mechanics, heat, light, sound, magnetism, and electricity; the adjustment and use of instruments of precision. Results and errors are carefully discussed. Students that are specializing in chemistry are required to take four hours. Other students may elect the desired number of hours.

15. PHOTOMETRY. Either term or throughout the year, credit one to four hours a term. Prerequisite courses 1, 6 or 10, and 14. Mr. RICHTMYER. Hours to be arranged, Rockefeller.

A study of candle power and distribution of various sources of artificial light. Various forms of photometers will be investigated and calibrations made. Tests will be made of the distribution of light within a room under various conditions.

It is recommended that course 43 should be taken along with this course.

18. THEORY AND PRACTICE OF PHOTOGRAPHY. Repeated in second term, credit two hours. Prerequisite, the knowledge of chemistry and physics, that in general is possessed by those who have completed Chemistry 1 and Physics 1. Assistant Professor MOLER and Mr. SOMERVILLE. Lecture, Th, 3.30 and one three-hour laboratory period weekly; M T F, 2-5, or W Th, 9-12, Rockefeller Hall, Lectures in A.

19. ADVANCED PHOTOGRAPHY, with special reference to its application to research. Repeated in second term, credit two hours. Prerequisite courses 1, 10 or 14, and 18, or the equivalent. Assistant Professor MOLER. Rockefeller Hall, Photographical Laboratory.

An attendance equal to six hours per week is required in this course.

[20. HEAT. First term, credit three hours. Assistant Professor BLAKER. Courses 20-23 and 25 are intended for those who desire a more detailed study of the work indicated and who are preparing to teach or to take the advanced courses in theoretical physics which follow. Advanced mathematics is not required but if the calculus has not been taken it is advisable to take it at the same time. Physics 14 and 25 should be taken with 20-23.]

Not given in 1910-11.

21. LIGHT. Second term, credit three hours. Prerequisite courses 1 and 6. Assistant Professor BLAKER. T Th S, 9, Rockefeller, Lecture Room C.

[22. ELECTRICITY AND MAGNETISM. Second term, credit three hours. Prerequisite courses 1 and 6. Assistant Professor BLAKER.]  
Not given in 1910-11.

23. PROPERTIES OF MATTER. First term, credit three hours. Prerequisite courses 1 and 6. Assistant Professor BLAKER. T Th S, 9, Rockefeller, Lecture Room C.

25. ADVANCED LABORATORY PRACTICE. Either term or throughout the year. Credit two to eight hours a term. Prerequisite courses 1, 6 or 10, and at least four hours of 14. Assistant Professor BLAKER. Rockefeller, various rooms.

A laboratory course in general physics for students who desire to teach experimental physics or who desire to prepare themselves for the advanced laboratory courses in general physics which follow. The experiments will be selected to meet the requirements of the individual student.

33. ALTERNATING CURRENTS. First term, credit two hours. Prerequisite courses 1, 6 or 10, and 14. Professor BEDELL. T Th, 10, Rockefeller.

A study of the underlying principles of alternating electric currents; the development of graphical methods of analysis as a basis for testing and for the solution of practical problems.

34. ELECTRICAL LABORATORY PRACTICE. Either term or throughout the year, credit three hours a term. Prerequisite courses 1, 6 or 10, and 14. Professor BEDELL and Mr. PIERCE. Daily 9-1, Rockefeller.

General dynamo laboratory practice and the testing of direct and alternating current apparatus and their application.

35. ADVANCED COURSE IN ELECTRICAL LABORATORY. Either term or throughout the year, credit two to eight hours a term. Prerequisite courses 1, 6 or 10, and 14. Professor BEDELL and Mr. PIERCE. Daily 9-1.

Similar to course 34 but of wider scope, the character of the work will be arranged to meet individual needs.

Primarily for graduates.

37. THESES IN APPLIED ELECTRICITY. Throughout the year or second term, credit two to eight hours a term. Prerequisite courses 1, 6 or 10, and 14. Professor BEDELL and Mr. PIERCE. To be arranged, Rockefeller.

39. DESIGN AND CONSTRUCTION OF APPARATUS FOR RESEARCH. First term, credit two hours. Assistant Professor MOLER. Rockefeller Hall.

Lectures and laboratory at hours to be arranged.

Primarily for graduates.

40. RECENT ADVANCES IN EXPERIMENTAL PHYSICS. Throughout the year, credit one hour a term. Professor MERRITT. F, 12, Rockefeller B.

Lectures, illustrated by experiments whenever the nature of the subject permits, devoted to some of the important recent discoveries in physics. In 1910-11 about half this time will be given to the subject of electric waves.

- [41. THE ELECTRIC TRANSMISSION OF INTELLIGENCE. Credit one hour. Prerequisite courses 1, 6 or 10, and 14. Professor NICHOLS.]

Not given in 1910-1911.

42. PRIMARY AND SECONDARY BATTERIES. Second term, credit one hour. Prerequisite courses 1, 6 or 10, and 14. Professor NICHOLS. S, 12, Rockefeller B.

A lecture course on the theory of voltaic cells and storage batteries.



43. PHOTOMETRY AND THE PHYSICS OF ILLUMINATION. First term, credit two hours. Prerequisite courses 1, 6 or 10, and 14. Professor NICHOLS. Hours to be arranged, Rockefeller B.

Lectures on the theory of artificial illumination and on methods of determining the temperature, efficiency, and quality of sources of light.

[44. THE MEASUREMENT OF CURRENT, ELECTROMOTIVE FORCE, AND RESISTANCE. Credit one hour. Prerequisite courses 1, 6 or 10, and 14. Professor NICHOLS.]

Not given in 1910-11.

45. ADVANCED LABORATORY WORK IN GENERAL PHYSICS. Throughout the year or either term. Prerequisite courses 1, 5, 8, 9, 4 hours of 14, and 25; 1, 6, 4 hours of 14, and 25; or 1, 2 hours of 10, 4 hours of 14, and 25. Professor NICHOLS, MERRITT, and SHEARER, Assistant Professor BLAKER, and Mr. DORSEY. Daily, Rockefeller.

[46. LIGHT. Throughout the year, credit four hours a term. Prerequisite courses 1, 6 or 10, and 14. Professor SHEARER.

Primarily for graduates.]

Not given in 1910-11.

47. HEAT. Throughout the year, credit four hours a term. Prerequisite courses 1, 6 or 10, and 14. Professor SHEARER. Hours to be arranged, Rockefeller B.

Production of high and low temperatures with methods of measurement; heat transfer; theory of heat and molecular physics; kinetic theory of matter.

Primarily for graduates.

48. READING COURSE ON THE ELECTRO-MAGNETIC THEORY OF LIGHT. Throughout the year. Prerequisite courses 1, 6 or 10, 14, and 46. Professor SHEARER. Hours to be arranged, Rockefeller.

The reading in this course is chiefly of French and German treatises.

Primarily for graduates.

[49. THE APPLICATION OF MATHEMATICS TO PHYSICS. Throughout the year, credit two hours a term. Prerequisite courses 1, 6 or 10, and 14. Professor SHEARER. Primarily for graduates.]

Not given in 1910-11.

50. PHYSICS SEMINARY. Throughout the year, credit two hours a term. Professor NICHOLS. Hours to be arranged, Rockefeller B.

A colloquium in which all members of the teaching staff in physics and all graduate students take part.

[51. THEORETICAL PHYSICS. Mechanics and thermodynamics. Throughout the year, credit four hours a term. Professor MERRITT.

Primarily for graduates.]

Not given in 1910-11.

52. THEORETICAL PHYSICS. Electricity and magnetism. Throughout the year credit four hours a term. Professor MERRITT. Probably M T W Th, 8, Rockefeller B.

Primarily for graduates.

53. ELECTRICITY AND MAGNETISM. Throughout the year. Prerequisite course 52 or its equivalent. Professor MERRITT. Hour to be arranged.

The character of this course and the method of conducting it will be determined by the needs of the students that elect it. At present the treatise of Abraham and Foeffe is used as a basis for the work.

Primarily for graduates.

54. THERMODYNAMICS. Throughout the year, credit two or three hours a term. Prerequisite courses 1, 6 or 10, and 14, and Mathematics 1. Physics 20 is advised, though not required, as a preliminary course. Professor TREVOR. Hours to be arranged.

## CHEMISTRY

## SPECIAL COURSE IN CHEMISTRY

The four year course in chemistry and allied subjects that is outlined below is offered for students who plan to follow chemistry as a profession, and serves to prepare them either for teaching or for commercial work.

Those who intend to pursue this course are strongly advised to defer the study of chemistry until after they have entered the University, and to take before entrance solid geometry, advanced algebra, plane and spherical trigonometry, three years of preparatory German, three years of preparatory French, and four years of preparatory English instead of three. Failure to comply with this recommendation will necessitate the completion of the unfinished work after the student has entered the University, and may result in the prolongation of his course beyond the usual four years.

This special course is open to all students registered in the College of Arts and Sciences.

Students who are registered in the special course in chemistry will be excused from the requirement mentioned in paragraph 12, page ii, but will not be permitted to deviate from the course outlined below without the approval of Professor Dennis.

First Year.	No. Course.	First Term.	Second Term.
Introductory Inorganic Chemistry-----	1	6	—
Qualitative Analysis-----	7	—	6
Mathematics: Analytic Geometry, Dif- ferential Calculus, Integral Calculus--	3	5	5
Physics-----	1	4	—
Physics-----	6	—	4
Physics-----	10	—	2
Drawing (Sibley College)----- D.	3	3	—
Second Year.	No. Course.	First Term.	Second Term.
Organic Chemistry-----	30	6	6
Quantitative Analysis-----	12	6	—
Spectroscopic Chemical Analysis-----	17	—	2
Mechanics of Engineering (Civil Engi- neering)-----	20	5	5
Physics-----	14	1	3
Third Year.	No. Course.	First Term.	Second Term.
Introductory Physical Chemistry-----	50	3	3
Physical Chemistry Laboratory-----	51	3	3
Microchemical Methods-----	65	—	2
Gas Analysis-----	19-20	3	—
Mineralogy-----	11	3	3
Advanced Quantitative Analysis-----	14	—	4
Quantitative Analysis—Lectures-----	15	2	—
Mechanical Laboratory (Sibley College) E. X.	11	3	3
Fourth Year.	No. Course.	First Term.	Second Term.
Electrochemistry-----	56a	3	—
Electrochemistry-----	56c	4	—
Assaying-----	18	3	—
General Economic Geology-----	32	3	3
Electrical Engineering Laboratory (Sibley College),-----	E. 13	—	3
Potable Water-----	75	—	2
Water Analysis-----	76	—	3
Research-----	96	At least 4 hrs. per term.	

Seminary, once every other week throughout the year.

In filling out the remainder of his time the student may elect advanced courses either in chemistry, or in other departments of the College of Arts and Sciences, or, under the regular restrictions, in Sibley College.



## INTRODUCTORY INORGANIC CHEMISTRY

1. **INTRODUCTORY INORGANIC CHEMISTRY.** Lectures, recitations, and laboratory. Repeated in second term, credit six hours.

1a. Lectures. First term, T Th S, 11, Professor DENNIS and Mr. SUTHERLAND; M W F, 11, Professor BROWNE and Mr. SUTHERLAND. Second term, M W F, 11. Morse 1.

1b. Recitations (one hour a week to be arranged), and laboratory (two 2½ hour periods a week to be arranged). Professors DENNIS and BROWNE, Mr. WELSH, and Messrs. HOLMES, HOULEHAN, GAUB, FINK, HOLLINGSHEAD, and NUNEZ.

Entrance credit in chemistry does not carry with it University credit in course 1. If a student entering the University from a preparatory school desires credit in course 1, he must pass an examination set by the department of chemistry. This examination (for details see University Register, 1909-10, page 57) is held both in New York City and in Ithaca on the same day in September as the entrance examination. University credit in course 1 that is obtained by passing this examination does not carry with it entrance credit in chemistry.

Examinations for those who were unavoidably absent from the term examination in course 1, and for those who have conditions to remove in this course, will be held at 2 p.m. on the day before instruction begins in the fall, and also in the month of May at a date to be announced. No special examinations will be given at other times.

## ANALYTICAL CHEMISTRY

6. **QUALITATIVE AND QUANTITATIVE ANALYSIS.** Repeated in second term, credit five hours. Prerequisite course 1. Dr. LUNDELL, Mr. LEMON, and Messrs. MILLER, RIEGGER, DILLON, WALKER, RHODES, and UHLRICH. Lectures, T Th, 12, Morse L. R. 1.

Laboratory sections: M W F, 2-5; T Th S, 8-11; T Th S, 9-12.

Qualitative work: the properties and reactions of the common elements and acids and their detection in various liquid and solid mixtures.

Quantitative work: the preparation and use of volumetric solutions and work in elementary gravimetric analysis.

7. **QUALITATIVE ANALYSIS.** Second term, credit six hours. Prerequisite course 1. Dr. LUNDELL, Mr. LEMON, and Mr. ———. Lectures T Th, 9, Morse L. R. 3.

Laboratory, M F, 11-1; T Th, 2-5.

The properties and reactions of the common elements, and of the inorganic and organic acids, also the qualitative analysis of a number of solutions and solid mixtures.

Students in science are advised and those who are specializing in chemistry are required to take this course instead of course 6.

12. **QUANTITATIVE ANALYSIS, ELEMENTARY COURSE.** First term, credit six hours. Prerequisite 6, or preferably 7. Dr. LUNDELL and Messrs. COTHMAN and MARSH. Lectures, T Th, 9.

Laboratory sections: T W Th, 2-5.30; W Th, 2-5.30 and S, 9-12.30.

The preparation and standardization of various volumetric solutions and their use in analyzing a variety of substances; gravimetric methods.

Students in science are advised and those who are specializing in chemistry are required to take this course instead of the quantitative analysis of course 6.

14. **QUANTITATIVE ANALYSIS, ADVANCED COURSE.** Repeated in second term. Credit one to four hours. Prerequisite course 6, or 7 and 12. Dr. LUNDELL, and Messrs. COTHMAN and MARSH.

Laboratory sections: 1st term, M T W Th, 2-5.30; T S, 9-12.30; 2nd term, M T W Th F, 2-5; T Th S, 9-12.30.

Gravimetric, volumetric, and electrolytic methods of analysis, and methods of combustion analysis; analysis of iron ores, iron and steel, slags, paints, lubricants, coal and coke, cements and cement materials, alloys, ores of copper, lead, zinc, mercury, manganese, tin, etc.

Designed for students that are specializing in chemistry, and as an elective for mechanical and civil engineering students.

15. **QUANTITATIVE ANALYSIS, ADVANCED LECTURES.** First term, credit two hours. Prerequisite course 6, or 7 and 12. Dr. LUNDELL. M W, 11, Morse, L. R. 3.

Selected topics in advanced quantitative analysis.

Designed for students that are specializing in chemistry.

17. **SPECTROSCOPIC CHEMICAL ANALYSIS AND COLORIMETRY.** Second term, credit two hours. Prerequisite courses 6, or 7 and 12; Physics 1 and 6. Mr. SHETTERLY, and Messrs. WILSON and ———. Lecture, W, 11, Morse, L. R. 3.

Laboratory practice, (three actual hours) at hours to be arranged.

The lectures are devoted to a description of the instruments used in the laboratory and to a detailed discussion of spectroscopic methods.

The laboratory instruction includes the following work: the observation and mapping of emission spectra of various elements in the Bunsen flame, the electric arc, and the electric spark; the qualitative analysis of mixtures and minerals by the use of the Krüss spectroscope and the direct vision spectroscope; the observation and mapping of absorption spectra; the examination and identification of rare earths and of organic dyes in solution by means of their absorption spectra; the calibration of spectroscopes; spectrum photography; and practice in the use of colorimeters, polariscopes, and refractometers of various types.

18. **ASSAYING.** First term, credit three hours. Prerequisite course 6, or 7 and 12, and if possible a course in mineralogy. Dr. LUNDELL and Mr. COTHMAN. Lecture, F, 10, Morse 2.

Laboratory sections: M W, 2-5; W F, 2-5; M F, 2-5.

Lectures on the theory and practice of the scorification and crucible assay, and on the metallurgy of copper, lead, zinc, silver, and gold. In the laboratory, practice is given in assay of zinc, lead, copper, gold, and silver ores, mattes, and bullion.

Designed for students that are specializing in chemistry, and as an elective for students in mechanical and civil engineering.

19. **QUALITATIVE AND QUANTITATIVE GAS ANALYSIS.** Lectures. First term, credit one hour. Prerequisite courses 6, or 7 and 12; Physics 1 and 6. Professor BROWNE and Mr. SHETTERLY. T, 9, Morse L. R. 3.

A detailed discussion of many representative types of apparatus employed by the gas analyst, and of the various methods of analysis involved in their use. Numerous simple problems are assigned which afford practice in the calculation and interpretation of the results obtained in gas analysis work.

20. **TECHNICAL GAS ANALYSIS.** First term, credit two hours. Prerequisite courses 6, or 7 and 12; Physics 1 and 6. Open to those who are taking course 19. Mr. SHETTERLY, and Messrs. WILSON and ———. Laboratory practice at hours to be arranged.

The analysis of gas mixture with the apparatus of Honigsmann, Bunte, Orsat, Lunge, and Hempel; the complete analysis of flue gas, illuminating gas, generator gas, acetylene, and air; the determination of the heating power of gaseous, liquid, and solid fuels, and the analysis of various substances by gas analysis methods involving the use of the different types of gas evolution apparatus such as the nitrometers of Hempel, Lunge, and Bodländer. Within certain limits the work may be selected to suit the requirements of the individual student.

21. **GAS ANALYSIS.** Advanced Course. Repeated in second term, credit one to four hours. Prerequisite courses 1, 6 (or 7 and 12), 19, and 20; Physics 1, and 5 or 6. Professor BROWNE and Mr. SHETTERLY. Hours to be arranged, Morse.

Special topics in the field of either scientific or industrial gas chemistry. The course may be elected by seniors and graduate students in chemistry, and is open to seniors or graduates in mechanical engineering that are specializing in gas power work.



## ORGANIC CHEMISTRY

30. ORGANIC CHEMISTRY. Throughout the year, credit six hours a term. Prerequisite courses 7 and 12. Professor ORNDORFF, Mr. NICHOLS, and Messrs. HITCH and CONKLIN. Lectures and written reviews, M W F, 9, Morse L. R. 3.

Laboratory sections: M T, 1-5.30; F, 1-5.30 and S, 8-1. Morse 9.

The lecture and written reviews serve as an introduction to the general subject of the chemistry of the compounds of carbon. In the laboratory the student prepares a large number of typical compounds of carbon and familiarizes himself with their properties, reactions, and relations. The detection of inorganic elements in organic compounds and the recognition of various groups or radicals is included in the laboratory work.

31. ORGANIC CHEMISTRY. Throughout the year, credit three hours a term. Prerequisite courses 7 and 12. Professor ORNDORFF and Mr. HITCH. M W F, 9, Morse L. R. 3.

This course consists of the lectures and written reviews of course 30.

32. ELEMENTARY ORGANIC CHEMISTRY. First term, credit four hours. Prerequisite courses 1, 7, and 12, or the equivalent. Mr. NICHOLS and Mr. CONKLIN. Lectures, and oral and written reviews, M W F, 12, Morse L. R. 3. Laboratory Th, 2-5, Morse 10.

33. SPECIAL CHAPTERS IN ORGANIC CHEMISTRY. Throughout the year, credit two hours a term. Prerequisite course 30. Professor ORNDORFF. T Th, 9, Morse L. R. 2.

Especial attention is given to certain important chapters of organic chemistry. Frequent references are made to the original literature, and an attempt is made to acquaint the student with the classical researches in organic chemistry.

34. ADVANCED ORGANIC CHEMISTRY. Laboratory practice. Throughout the year. Open to those who have had 30 and are taking 33. Professor ORNDORFF and Mr. NICHOLS. Hours to be arranged. The laboratory is open daily, Morse 10.

The course in the preparation of organic compounds is here continued, the preparations, however, being more difficult and requiring more experience and skill on the part of the student. The original literature is consulted, and, before taking up original work in this field, the student is finally required to repeat some extended and important piece of work, and to compare his results with those published.

35. THE COAL TAR DYESTUFFS. First term, credit one hour. Open to those who have had 30 and have had or are taking 33. Professor ORNDORFF. Th, 12, Morse L. R. 3.

The coal tar dyestuffs have become so important, both theoretically and practically, as to justify their consideration in a separate course of lectures. The methods of making the dyestuffs, their properties, constitution, and relations to each other are discussed, the treatment being scientific rather than technical.

36. STEREOCHEMISTRY. Second term, credit one hour. Prerequisite course 30 or 31. Professor ORNDORFF. Th, 12, Morse L. R. 3.

The stereochemistry of the compounds of carbon and nitrogen. The necessity of considering the space relations of the atoms in certain classes of physical isomers is shown and the close agreement of the facts and theory is brought out.

37. METHODS OF ORGANIC ANALYSIS. Throughout the year. Prerequisite course 30. Professor ORNDORFF and Mr. NICHOLS. Hours to be arranged. The laboratory is open daily, Morse 10.

Designed for students that desire practice in the qualitative and quanti-

tative analysis of commercial organic products such as alcohols, ethers, organic acids, glycerin, formalin, acetates, coal tar distillates, petroleum products, soaps, acetanilid, etc.

#### INORGANIC CHEMISTRY

[46. INORGANIC CHEMISTRY. Advanced course. Throughout the year, credit two hours a term. Prerequisite course 30 and open to those who have completed or are taking courses 50 and 51. Professor DENNIS.

The chemical elements are discussed in the order in which they occur in the Periodic Law of Mendeleeff, and special attention is paid to the group properties of the elements and to the relations of the groups to one another. The rare elements and the rare earths are treated in as great detail as are the more common elements.]

Not given in 1910-11.

47. ADVANCED INORGANIC CHEMISTRY. Laboratory practice. Throughout the year. Prerequisite course 30. Professors DENNIS and BROWNE and Mr. ANDERSON. Morse 68.

The preparation and purification of inorganic compounds and the extraction of the rarer elements from ores and minerals.

Course 47 is designed to accompany course 46, but either course may be taken separately.

48. SELECTED TOPICS IN ADVANCED INORGANIC CHEMISTRY. First term, credit one hour. Prerequisite course 30. Courses 50 and 51 should either precede or accompany 48. Professor BROWNE. Th, 11, Morse L. R. 3.

Experimental lectures, dealing chiefly in 1910-11 with the hydronitrogens and their derivatives.

Open only to seniors and graduate students in chemistry.

49. CHEMISTRY OF GASES. First term, credit one hour. Prerequisite course, 6, or 7 and 12, and should be preceded or accompanied by 19 and 20. Professor BROWNE. T, 11, Morse L. R. 3.

The preparation, properties, and reactions of a large number of gases are discussed, and in many cases are illustrated by experiments. The various generalizations concerning gases are considered, not only in the light of their scientific value, but also to some extent from the point of view of their application to the practical problems of the gas chemist and of the gas engineer. The course may be elected by juniors, seniors, and graduate students in mechanical engineering that intend to specialize in gas power work.

#### PHYSICAL CHEMISTRY

50. INTRODUCTORY PHYSICAL CHEMISTRY. Throughout the year, credit three hours a term. Prerequisite courses 30 and Physics 14. Mr. WHITE. M W F, 9, Morse L. R. 4.

A systematic presentation of modern chemical theory. Especial attention is paid to the theory of solution, reaction velocity, catalysis, chemical equilibrium, and the application of the principles of physical chemistry to chemical practice.

51. PHYSICAL CHEMISTRY LABORATORY. Throughout the year, credit three hours a term. Open only to those who have taken or are taking course 50. Messrs. WHITE and BRIGGS. Two laboratory periods a week: M T, 2-5; F, 2-5, S, 9-12. Morse 77.

With the data obtained in the laboratory as a basis, detailed reports covering each sub-division are written. The subject matter includes: the calibration of pipettes, burettes, and measuring flasks; molecular weight determination by vapor density, freezing point and boiling point methods; vapor pressure; viscosity; colloids; diffusion; absorption; thermo-chemistry; reaction velocity; catalysis; dissociation; solubility; formation, separation and identification of phases; study of photo-chemical effects.



[52. ADVANCED PHYSICAL CHEMISTRY. Lectures throughout the year, credit three hours a term. Prerequisite course 50. Professor BANCROFT. An exposition of the law of mass action in its application to chemical equilibrium and reaction velocities.]

Not given in 1910-11.

53. COLLOID CHEMISTRY AND PHOTOCHEMISTRY. Lectures. Second term, credit three hours. Professor BANCROFT. M W F, 12, Morse L. R. 4. The theories of colloid chemistry and of photochemistry, with special reference to photography. For advanced students in chemistry or physics.

55. THEORETICAL ELECTROCHEMISTRY. Lectures. Throughout the year, credit three hours a term. Professor BANCROFT. M W F, 10, Morse L. R. 4.

The historical development of the subject with special reference to the theory of the voltaic cell. For advanced students in chemistry or physics.

56a. APPLIED ELECTROCHEMISTRY. Lectures. First term, credit three hours. Prerequisite courses, 6, or 7 and 12. Professor BANCROFT and Messrs. SKILLMAN and BENNETT. M W F, 12, Morse L. R. 4.

The preparation of compounds in the electric furnace; electrolytic extraction and refining of metals; theory of plating; electrolytic manufacture of inorganic and organic compounds; theory and practice of storage cells. Students that take this course are advised to supplement the lectures by laboratory practice, course 56b or 56c; this is however not obligatory.

56b. APPLIED ELECTROCHEMISTRY. Second term, credit two hours. Prerequisite courses 56a; Physics 10 or 14. Messrs. SKILLMAN and BENNETT. Laboratory practice, one morning or one afternoon 8-1 or 1.30-5.30, Morse 79.

Determination of current and energy efficiencies in electrolytic and electrothermal work; preparation and tests of storage batteries. Open to engineering students. Students that are specializing in chemistry are expected to elect course 56c instead of course 56b.

56c. APPLIED ELECTROCHEMISTRY. First term, credit four hours. Open to those who have had 50 and 51, and have taken or are taking 56a. Laboratory practice.

W 2-5, Th 8-1; F 2-5, S 8-1. Morse 79. Professor BANCROFT, and Messrs. SKILLMAN and BENNETT.

Preparation of electrical standards and measurements of electrical constants; qualitative study of conditions affecting electrolytic reactions; determination of current and energy efficiencies in electrolytic and electrothermal work; preparation and tests of storage batteries; electrolytic preparation of inorganic and organic compounds. For students that are specializing in chemistry.

57. ADVANCED LABORATORY PRACTICE. Either term or throughout the year. Credit, one to six hours a term. Prerequisite courses determined in each case by the professor in charge. Professor BANCROFT, Mr. WHITE, and Messrs. SKILLMAN and BENNETT. Hours and work to be arranged. Morse.

Students may elect work in mass law, reaction velocity, or efficiency measurements with special reference to course 52; in photochemistry or photography with special reference to course 53; in conductivity or electrometric determinations with special reference to course 55; in electrolytic or electric furnace products with special reference to course 56; in metallography; in the application of physical chemical methods to organic chemistry.

#### MICROCHEMISTRY AND MICROCHEMICAL ANALYSIS

65. MICROCHEMICAL METHODS. Second term, credit two hours. Prerequisite courses 6, or 7 and 12. Professor CHAMOT and Mr. RATHJEN. Laboratory practice at hours to be arranged.

The use of the microscope and its accessories, and microchemical methods and apparatus as applied to chemical investigations.

66. MICROCHEMICAL ANALYSIS. First term, credit three hours. Prerequisite course 65. Professor CHAMOT and Mr. RATHJEN. Laboratory practice at hours to be arranged, Morse.

Practice in the examination and analysis of inorganic substances containing the more common elements with reference to rapid qualitative methods and the analysis of minute amounts of materials.

67. MICROCHEMICAL ANALYSIS. First term, credit two or more hours. Prerequisite course 66. Professor CHAMOT. Laboratory practice, Morse.

This course may be arranged so as to comprise the analysis of inorganic substances containing the rarer elements or of organic compounds.

#### SANITARY CHEMISTRY

[70. FOODS, BEVERAGES, AND FOOD ACCESSORIES. First term, credit two hours. Prerequisite course 6, or 7 and 12. Professor CHAMOT.

The source, preparation for use, and the chemistry of foods, beverages, and food accessories; the individual and relative assimilability, digestibility, and nutritive value of food products; the relation of pure and adulterated foods to the public health; the adulteration, sterilization, and preservation of foods; dietary standards, and the methods for carrying on nutrition investigation.]

Not given in 1910-11.

[71. FOOD ANALYSIS. First term. Prerequisite course 6, or 7 and 12. Professor CHAMOT and Mr. REDFIELD.

The examination of foods by chemical and optical methods, with reference to adulteration, imitation, and alteration; the examination of foods for artificial coloring matters, preservatives, and poisonous substances; a study of milk, comestible fats and oils, cereal products and starchy foods, canned goods, jellies, etc. This course may be extended so as to include the analysis of alcoholic beverages.]

Not given in 1910-11.

72. MICROSCOPICAL EXAMINATION OF FOODS. First term, credit two hours. Prerequisite course 66. Professor CHAMOT and Mr. RATHJEN. Hours to be assigned.

The use of the microscope in the examination of foods and condiments for the purpose of detecting adulterations and admixtures.

75. POTABLE WATER. Second term, credit two hours. Prerequisite course 6, or 7 and 12. Professor CHAMOT. T Th, 11, Morse L. R. 2.

Sources of potable water; how polluted; agencies at work leading to the natural or self purification of streams, etc., and what they accomplish; the data necessary for a decision as to the fitness of a water for household use, and for use in steam generators; the interpretation of the results of water analysis, chemical, microscopical, and bacteriological. Modern methods of water purification.

76. WATER ANALYSIS. Second term, credit three hours. Prerequisite course 6, or 7 and 12. Professor CHAMOT and Mr. REDFIELD. Hours to be arranged, Morse.

The methods employed for the examination of waters with reference to their fitness for household purposes, steam boilers, etc; the testing of filters and water purifying devices for efficiency.

80. TOXICOLOGY. First term, credit two hours. Prerequisite course 30. Professor CHAMOT. W F, 12, Morse L. R. 2.

A review of the present methods for the separation and identification of the common poisons, together with a brief review of the classification, cause of action, and method of elimination of poisonous substances.



81. TOXICOLOGY. First term, credit two hours. Prerequisite course 30, and open only to those who are taking 80. Professor CHAMOT. M W F, 2-5, Morse.

#### AGRICULTURAL CHEMISTRY

85. AGRICULTURAL CHEMISTRY. Second term, credit four hours. Prerequisite course Chemistry 1. Professor CAVANAUGH and Messrs. HEDGES, CROSS, and RICE. Lectures T Th S, 11. One recitation a week M, 8 or 9; W, 8 or 9; F, 8 or 9. Morse L. R. 1.

A general course treating of the relation of chemistry to agriculture and dealing with the composition and chemical properties of plants, soils, fertilizers, feed-stuffs, insecticides, and fungicides.

85a. AGRICULTURAL CHEMISTRY, LABORATORY COURSE. Repeated in second term, credit two hours. Prerequisite courses 1, 6, 85. Professor CAVANAUGH and Messrs. HEDGES and RICE. T Th, 2-4.30, W F, 8-10.30, Morse, Quantitative Laboratory.

Designed to accompany course 85.

86. AGRICULTURAL CHEMISTRY, ADVANCED COURSE. Credit two hours. Prerequisite course 87 or 88, or may be taken at same time with 87 or 88. Professor CAVANAUGH. T Th 9, Morse L. R. 4.

87. AGRICULTURAL ANALYSIS. First term, credit three hours. Prerequisite courses 1, 6, 85a, 86, or may be taken at same time with 86. Professor CAVANAUGH and Mr. CROSS. T Th, 2-5, S, 9-12, Morse 57.

The methods of the A.O.A.C. are studied, in the analysis of fertilizers, soils, and insecticides.

88. AGRICULTURAL ANALYSIS. Second term, credit three hours. Prerequisite courses 87, 89. Professor CAVANAUGH and Mr. CROSS. T Th, 2-5, S, 9-12, Morse 57.

Methods of the examination of foods, feed-stuffs, and dairy products.

89. DAIRY CHEMISTRY. First term, credit two hours. Prerequisite courses 85, 85a. Professor CAVANAUGH. T Th, 9, Morse L. R. 4.

90. ADVANCED AGRICULTURAL ANALYSIS. Repeated in second term. Prerequisite courses 86 or 89, 87, 88. Professor CAVANAUGH. Credit and hours by appointment, Morse 57.

Designed to meet the needs of those who are doing research in agricultural chemistry.

#### SEMINARY

95. SEMINARY. Throughout the year. Morse L. R. 3.

One hour every other week throughout the year.

This is a general seminary in which graduate students with major subjects in chemistry, and seniors that are specializing in chemistry are expected to take part.

#### RESEARCH

96. RESEARCH FOR UNDERGRADUATE STUDENTS. Throughout the year. Morse.

Seniors that are specializing in chemistry are expected to elect at least four hours a term in research under the direction of some member of the staff of instruction.

#### BOTANY

I. GENERAL COMPARATIVE MORPHOLOGY AND PHYSIOLOGY OF PLANTS. First term and until March 25, credit three hours first term; one hour second term. Professor ATKINSON and Messrs. STONE, PETRY, and ——. One lecture, M, 10, 11, or 12, and two laboratory periods a week as follows:

Sec. 1, M, 2-4.30, W, 2-4.30; sec. 2, T, 8-10, 2-5; sec. 3, Th, 8-10, 2-5; sec. 4, first term: F, 9-11, S, 9-12; second term: F, 9-12, S, 9-11. Sage College, Botanical Lecture Room.

A study of representative plants of various groups and of the fundamental principles of plant life, relationship, and evolution.

2. SPECIAL MORPHOLOGY, TAXONOMY, AND ECOLOGY OF THE HIGHER PLANTS. Second term beginning March 27, credit two hours. Prerequisite course 1. Professor ROWLEE and Messrs. STONE, BROWN, and PETRY. One lecture, M 10, 11, or 12, and two laboratory periods a week as follows:

Sec. 1, M W, 2-4.30; sec. 2, T, 8-10, 2-5; sec. 3, Th, 8-10, 2-5; sec. 4, Fri, 9-12, S, 9-11.

Sage College, Botanical Lecture Room.

Studies of typical plants representing the more general groups of angiosperms; field excursions for the purpose of studying the local flora.

3. ORGANOGRAPHY AND IDENTIFICATION OF THE HIGHER PLANTS. First term, credit three hours. Prerequisite courses 1 and 2. Professor ROWLEE and Mr. BROWN. Lectures S, 9; laboratory and field work, F afternoon and S morning. Sage College, Botanical Lecture Room.

Lectures, laboratory, and field work.

A study of the kinds of plants with special reference to the morphology, identification, habitat, and range of species. Extra field work will be substituted for some of the lectures.

5. GEOGRAPHICAL BOTANY. Second term. Professor ROWLEE and Mr. BROWN. Lecture S, 9. Laboratory exercises and excursions F, 2-5 and S. Sage College, Botanical Lecture Room.

The distribution of plants over the surface of the earth. Practical field studies in plant distribution; the preparation of an herbarium representing the local flora. Photographs are used to illustrate the distribution of plants.

6. EXOTICS. Throughout the year, credit one or two hours a term. Professor ATKINSON and Mr. SHORE. Hours by appointment.

The conservatory in connection with the department offers excellent opportunities for students that wish to become familiar with practical methods in propagation and cultivation of conservatory plants and in practical greenhouse work.

7. TAXONOMY AND PHYLOGENY OF ANGIOSPERMS. Throughout the year, credit three hours a term. Professor ROWLEE. Lectures, Th, 9. Laboratory work, W afternoon and Th morning, Sage College, Botanical Lecture Room.

A study of the genetic relationships of the phanerogamous orders. Practical studies in the laboratory of economic groups, illustrating the principles of natural classification.

8a. PLANT CYTOLOGY. First term, credit three hours. Prerequisite courses 1 and 2. Dr. BROWN. Lecture F, 9. Laboratory work, F afternoon and S morning, and by appointment, Sage College Histology Laboratory.

Introduction to methods of investigation. Studies of the vegetable cell, its multiplication and contents. Practical application of modern methods in a study of nuclear and cell-division.

8b. COMPARATIVE HISTOLOGY OF PLANTS. Second term, credit three hours. Prerequisite course 8a. Dr. BROWN. Lecture F, 9. Laboratory work, F afternoon and S morning, and by appointment, Sage College, Histology Laboratory.

Structure and development of the tissues of higher plants.

9a. DENDROLOGY. First term, credit three hours. Course 5 may advantageously precede. Dr. BROWN and Mr. BROWN. Lecture T, 9. Laboratory and field work M afternoon and T morning. Sage College, Histology Laboratory.



A biological and taxonomic study of trees and shrubs including laboratory study and field observations upon native species.

9b. DENDROLOGY. Second term, credit three hours. Courses 8b and 9a may advantageously precede this course. Dr. BROWN and Mr. BROWN. Lectures T, 10. Laboratory and field work, M afternoon and T morning. Sage College, Histology Laboratory.

Study of the development of woody structures, structure and properties of different kinds of wood, identification of woods.

10. COMPARATIVE MORPHOLOGY AND EMBRYOLOGY. Throughout the year, credit three hours a term. Prerequisite courses 1 and 2. Professor ATKINSON. Lectures, Th, 12. Laboratory work, M and W afternoons. Sage College, Botany Lecture Room.

A study of representative groups that illustrate the line of evolution of green plants. The development and homologies of sporogenous, reproductive, and embryological organs, with discussions of the principal plant phylae; permanent microscopic sections representing series in the liverworts, mosses, ferns, gymnosperms, and angiosperms; bryophyta; the pteridophyta; the gymnosperms and angiosperms.

11. MYCOLOGY. Throughout the year, credit four hours a term. Prerequisite courses 1 and 2. Professor ATKINSON and Mr. BARRETT. Lectures, T Th, 11. Laboratory work, M W afternoons. Sage College, Botany Lecture Room.

Intended as the basis for research in mycology and plant pathology. General classification, development, and plant pathology. Basidiomycetes, with especial attention to edible and poisonous mushrooms, and wood-destroying and parasitic species; the parasitic fungi; their history and development. Practice in the recognition of species, or research work may in some cases be taken as a parallel course. See course 14a.

12. TAXONOMY OF THE PTERIDOPHYTES, BRYOPHYTES, AND ALGAE. Throughout the year, credit three hours a term. Professor ATKINSON. Lecture, F, 11. Laboratory work, F afternoon and S morning, Sage College, Botany Lecture Room.

A study of typical genera, practice in taxonomy, and field work.

13. METHODS OF RESEARCH IN MORPHOLOGY AND EMBRYOLOGY. Prerequisite course 10, except by special permission. Professor ATKINSON. Hours by appointment, Sage College, Botany Lecture Room.

Original research in sporogeny or embryology and the morphology of the nucleus with reference to sporogenesis, spermatogenesis, oogenesis, and fertilization, or in experimental morphology. A thesis embodying the results of the work will be prepared.

Open to graduates and to undergraduates that are engaged in research.

14a. GENERAL TAXONOMIC SURVEY OF THE FUNGI. First term or throughout the year, credit four or eight hours. Prerequisite course 11, except by special permission. Professor ATKINSON and Mr. BARRETT. Hours by appointment, Sage College, Botany Lecture Room.

14b. RESEARCH IN MORPHOLOGY. Throughout the year, credit four hours a term. Professor ATKINSON. Hours by appointment.

Monograph of some genus or limited number of genera, or monographic study of development. A thesis combining the results of the investigation will be required. Reports weekly.

Primarily for graduates.

14c. METHODS OF RESEARCH IN PLANT PATHOLOGY. Professor ATKINSON and Mr. BARRETT.

Methods of cultivation of the fungi to secure familiarity with manipulation in methods of separation, pure culture, and study of development; problems in plant pathology; weekly conferences or lectures and discussions on the history and present condition of the subject.

15. PLANT PHYSIOLOGY. Prerequisite courses 1 and 2, and Education, course 8, 10, or 11, or the equivalent. Professor ATKINSON. Hours by appointment (not less than four a week, and more if the work is taken as a major).

Problems in the physical properties of growth, in nutrition, and in the effects of stimuli and certain natural and environmental forces upon cell activities, plant growth, development, etc. A thesis embodying the results of the investigations will be required.

16. RESEARCH IN TAXONOMY AND PHYLOGENY OF THE ANGIOSPERMS. Prerequisite courses 7 and 8, except by special permission. Professor ROWLEE. Hours by appointment.

Four hours or more a week. A monograph of some group, including a comparative study of organs of taxonomic value and their development. Groups for investigation will be assigned preferably in the preceding spring. Among the groups that may be taken up are the glume bearing monocotyledons, the amentiferous dicotyledons, and the compositae. Since different groups will be taken up in different years, students may pursue this course more than one year.

Primarily for graduates.

17. RESEARCH IN COMPARATIVE HISTOLOGY AND CYTOLOGY. Prerequisite courses 8a and 8b. Professor ROWLEE and Dr. BROWN.

Not less than four hours a week. May form the basis of a major or minor subject for an advanced degree. Special problems in the comparative histology of a series of organs, or the anatomy of an individual plant. Cytology: the biology and structure of starch, plastids, and other cell contents, also nuclear division and cell formation, with special reference to tissue development.

18. SEMINARY IN EMBRYOLOGY, MYCOLOGY, PHYSIOLOGY, ETC. Credit one hour. Professor ATKINSON. W, 5.

Discussions of current literature and problems under investigation. Required of all graduates and open to undergraduates that are interested in research.

19. SEMINARY IN COMPARATIVE HISTOLOGY AND TAXONOMY OF THE ANGIOSPERMS. Credit one hour. Professor ROWLEE. Hours by appointment.

Reading and discussion of current literature and problems under investigation in courses 16 and 17, will form the basis for the seminary work. Required of all graduates and open to undergraduates that are engaged in research.

## BIOLOGY

1. GENERAL BIOLOGY. Throughout the year, credit three hours a term. Two lectures and one laboratory period a week. Assistant Professor NEEDHAM and Professor COMSTOCK. Lectures, T Th, 10, Agricultural College, Auditorium. Laboratory, M, T, W, Th, or F, 2-4.30, or S, 8-10.30. Assistant Professor NEEDHAM and Messrs. MATHESON and LLOYD.

An elementary course designed to acquaint the general student with the main ideas of biology through selected practical studies of the phenomena on which biological principles are based. The interdependence of organisms, the simpler organisms, organization and phylogeny, oogenesis and ontogeny, heredity and variation, natural selection and adaptation, segregation and mutation, the life cycle, metamorphosis and regeneration, and the responsive life of organisms.



## ENTOMOLOGY AND GENERAL INVERTEBRATE ZOOLOGY

## [1. INVERTEBRATE ZOOLOGY.]

Not given in 1910-11. See course 1 in Vertebrate Zoology.

2. MORPHOLOGY OF INVERTEBRATES. Repeated in second term, credit two or more hours. Assistant Professor MACGILLIVRAY. Laboratory work by appointment, Agricultural College, Main 301.

The comparative study of the anatomy of representatives of the principal groups of invertebrates.

3. GENERAL ENTOMOLOGY. First term, credit two or three hours. Prerequisite course General Biology 1 or Zoology 1. Lectures, M W, 9, Agricultural College, Main 392. Professor COMSTOCK. Practical Exercises T or F, 2-4.30, Agricultural College, Main 301, Assistant Professor MACGILLIVRAY.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species. The practical exercises include a study of the structure of insects and practice in their classification. The lectures only (credit 2 hours) are taken by those who have had courses 4 and 5.

4. ELEMENTARY MORPHOLOGY OF INSECTS. Repeated in second term, credit three hours. Assistant Professor RILEY and Mr. ———. Laboratory open daily except Saturday, 8-5, Agricultural College, Main 391.

An introductory laboratory course required of all students who plan to do advanced work in the Department of Entomology.

5. ELEMENTARY SYSTEMATIC ENTOMOLOGY. Repeated in second term, credit three hours. Prerequisite course 5. Assistant Professor MACGILLIVRAY and Mr. ———. Laboratory open daily except S, 8-5, Agricultural College, Main 301.

A study of the wing venation of insects and the identification of specimens belonging to the more important orders and families. An introductory laboratory course required of all students who plan to do advanced work in the Department of Entomology.

6. ADVANCED SYSTEMATIC ENTOMOLOGY. Repeated in second term, credit three hours. Prerequisite course 5. Assistant Professor MACGILLIVRAY. Laboratory work by appointment, Agricultural College, Main 301.

A training course in the identification and interpretation of obscure characteristics used in the classification of insects.

7. HISTOLOGY OF INSECTS. Lectures, first term. Laboratory repeated in second term, credit three or more hours. Prerequisite courses 4 and 5. Assistant Professor RILEY. Lecture, Th, 11, Agricultural College, Main 392.

Practical exercises either term by appointment.

Designed for students of general zoology as well as for those who are preparing for research in insect morphology.

10. CLASSIFICATION OF THE COCCIDAE. Second term, credit five hours. Prerequisite course 6. Assistant Professor MACGILLIVRAY. Laboratory work by appointment, Agricultural College, Main 301.

Designed to familiarize the student with the more injurious species of scale insects, the methods of preparing specimens for study, and the systematic arrangement of the species.

11. MORPHOLOGY AND CLASSIFICATION OF THE ARACHNIDA. Throughout the year, credit three or more hours a term. Professor COMSTOCK and Miss STRYKE. Laboratory work by appointment, Agricultural College, Main 301.

Open only to graduates.

12. MORPHOLOGY AND DEVELOPMENT OF INSECTS. Second term, credit two hours. Prerequisite courses 1, 3, 4, and 5. Students are advised to take course 7, also, before taking this course. Professor COMSTOCK and Assistant Professor RILEY. T Th, 9, Agricultural College, Main 392.

14. GERMAN ENTOMOLOGICAL READING. Repeated in second term, credit one hour. Assistant Professor RILEY. W, 7-9 P. M., Agricultural College, Main 391.

Open only to advanced students in entomology or zoology.

[17. LITERATURE OF SYSTEMATIC ENTOMOLOGY. First term, credit two hours. Prerequisite course 5. Assistant Professor MACGILLIVRAY.

A systematic study of bibliographies, indexes, and general entomological literature; the preparation of catalogues of insects; the evolution of the rules of zoological nomenclature; and the methods of determining the priority of generic and specific names.]

Not given in 1910-11.

[18. EMBRYOLOGY OF INSECTS. Second term, credit one hour. Prerequisite courses 3, 4, and 5. Assistant Professor RILEY.

Alternates with course 12.]

Not given in 1910-11.

19. GENERAL LIMNOLOGY. Second term, credit three hours. Open only to students who have taken or are taking General Biology 1 and Entomology 3. Assistant Professor NEEDHAM. Lecture at hour to be arranged, Agricultural College, Main 302. Laboratory work:

Sec. 1, 2-4.30, Agricultural College, Main 302, or Biological Field Station. Assistant Professor NEEDHAM and Mr. LLOYD.

Sec. 2, by appointment.

An introduction to the study of the life of inland waters. Aquatic organisms in their qualitative, quantitative, seasonal, and ecological relations.

20. RESEARCH IN LIMNOLOGY. Throughout the year, credit three or more hours a term. Prerequisite course 19 or the equivalent. Assistant Professor NEEDHAM. Hours by appointment, Agricultural College, Main 302 and Biological Field Station.

Laboratory and field work.

22. ANIMAL PARASITES AND PARASITISM. First term, credit two hours. Must be preceded or accompanied by Biology 1 or Zoology 1, and Entomology 3. Assistant Professor RILEY. Lecture T, 8, Agricultural College, Main 392.

Practical exercises: Sec. 1, M, 2-4.30; sec. 2, T, 2-4.30.

A consideration of the origin and biological significance of parasitism, and of the structure, life history, and economic relations of representative animal parasites.

23. THE RELATIONS OF INSECTS TO DISEASE. Second term, credit two hours. Must be preceded or accompanied by Biology 1 or Zoology 1, and if possible by Entomology 3. Assistant Professor RILEY. Lecture T, 8, Agricultural College, Main 392. Practical exercises T, 2-4.30.

Causation and transmission of diseases by insects and other arthropods.

24. THE CLASSIFICATION OF IMMATURE INSECTS. Second term, credit two hours. Prerequisite course 5. Assistant Professor MACGILLIVRAY. Laboratory work by appointment, Agricultural College, Main 301.

The taxonomy of nymphs, larvae, and pupae.

27. RESEARCH IN MORPHOLOGY OF INSECTS. Throughout the year, credit three or more hours a term. Prerequisite courses 3, 4, and 5. Professor COMSTOCK and Assistant Professor RILEY. Laboratory open daily except S, 8-5; S, 8-1, Agricultural College, Main 391.

Special work arranged with reference to the needs and attainments of each student.



**SEMINARY.** Throughout the year. M, 4.30-5.30, Agricultural College, Main 392.

The work of an entomological seminary is carried on by the *Jugatae*, an entomological club which meets for the discussion of current literature and of the results of investigations. Attendance at the meetings may be counted as laboratory work.

**28. RESEARCH IN SYSTEMATIC ENTOMOLOGY.** Throughout the year, credit three or more hours a term. Prerequisite courses 3, 4, 5, and 6. Professor COMSTOCK and Assistant Professor MACGILLIVRAY. Laboratory open daily except S, 8-5; S, 8-1, Agricultural College, Main 301.

Special work arranged with reference to the needs and attainments of each student.

**ECONOMIC ENTOMOLOGY.** Second term, M W S. See Entomology in College of Agriculture, course 8.

**ADVANCED ECONOMIC ENTOMOLOGY AND INSECTARY METHODS.** Second term. By appointment. See Entomology in College of Agriculture, course 9.

**RESEARCH IN ECONOMIC ENTOMOLOGY.** Throughout the year. By appointment. See Entomology in the College of Agriculture, course 29.

## ZOOLOGY

For all the courses, the ability to draw freehand and to read ordinary French and German will be found very useful. A year each of Latin and of Greek will greatly facilitate the interpretation of technical terms which are so largely derived from those languages.

**1. ELEMENTARY ZOOLOGY.** Throughout the year, credit three hours a term. Prerequisite General Biology 1. Assistant Professor REED and Dr. EMBODY. T Th, 10, McGraw 5. Practicum Sections to be arranged.

Vertebrates and invertebrates. The lectures are illustrated with specimens, models, and charts. At the practicums representative forms are examined.

**2. ANATOMIC METHODS AND DISSECTION OF THE CAT.** Second term, credit three hours. Dr. WRIGHT. Laboratory and recitations at hours to be arranged, McGraw 9.

Designed for those who intend to teach physiology or who, in preparation for a medical course, desire to gain manipulative skill and familiarity with mammalian structures.

**3. COMPARATIVE ANATOMY.** First term, credit four hours. Prerequisite course 1. Assistant Professor REED and Dr. WRIGHT. Laboratory and recitations at hours to be arranged, McGraw 9.

A practical study of the structure of vertebrates as exemplified by representatives of the several classes.

**4. VERTEBRATE MORPHOLOGY AND EVOLUTION.** Second term, credit four hours. Prerequisite courses 1 and 3. Assistant Professor REED. Lectures and demonstrations at hours to be arranged, McGraw.

The several systems of organs are considered with reference to their structures, development, homologies, and evolution in time.

**5. SYSTEMATIC VERTEBRATE ZOOLOGY and ECOLOGY.** Throughout the year, credit three hours a term. Mr. ALLEN and Dr. EMBODY. Lecture M, 8. Laboratory: sec. 1, T, 2-4.30 and S, 8-10.30; sec. 2, F, 2-4.30 and S, 10.30-1, McGraw 7.

Lectures on the principles of classification and nomenclature: characters and relationships of groups; the habits, life histories, and economic value of the common species. Laboratory study of representative forms with

special reference to the parts employed in classification, and with a view to practical identification. Excursions to the woods, the streams, and the lake for the recognition and observation of animals in a natural state. Study of fishes, birds, and the other classes.

6. **ADVANCED VERTEBRATE TAXONOMY.** Throughout the year, credit three hours a term. Prerequisite course 5. Dr. WRIGHT. Hours to be arranged, McGraw 9.

A fuller consideration of the vertebrate groups with respect to the taxonomic value of organs, geographic distribution, genetic relationships, and the principles of classification and nomenclature; ornithology and mammalogy; in 1911-12 ichthyology and herpetology.

7. **ADVANCED VERTEBRATE ECOLOGY AND ECONOMIC ZOOLOGY.** Throughout the year, credit three hours a term. Prerequisite course 5. Dr. WRIGHT and Mr. ALLEN. Laboratory and field work with collateral reading at hours to be arranged. McGraw 9.

A more detailed study of the habits, food, life-histories, and economic importance of vertebrates; the relations of animals to their environment. Any phase of the general subject in which the student is particularly interested may be assigned for investigation and report.

[8. **MORPHOLOGY OF THE BRAIN.** Second term, credit two hours. Prerequisite course 1, 2, or 4.

The several types of vertebrate brain, beginning with that of the acanth shark; the value of the brain in classification; the development and morphology of the human brain; its resemblances and peculiarities, especially as compared with those of apes; the cerebral fissures as criteria of zoologic or racial affinity, as indexes of physical or mental power, and as boundaries of functional areas].

Not given in 1910-11.

[9. **COMPARATIVE ANATOMY OF THE BRAIN.** Second term, credit two hours. Prerequisite course 2, or 3.

Beginning with the brain of the acanth shark, the forms examined parallel and supplement as far as possible those discussed in course 8. The actual dissections of mammalian brains are done upon those of the cat and sheep, but each student is enabled to study and draw prepared specimens from many groups, including monkeys, apes, and man, fetal as well as adult].

Not given in 1910-11.

[10. **ADVANCED BRAIN MORPHOLOGY.** Throughout the year, two hours a term. Prerequisite courses 8 and 9 and Histology 2.

Not given in 1910-11.

11. **RESEARCH AND THESES.** Throughout the year. The Department staff.

12. **SEMINARY.** Throughout the year. W, 4.45, McGraw 2.

## PHYSIOLOGY

3. **ELEMENTARY HUMAN PHYSIOLOGY.** First term, credit three hours. Professor SIMPSON and Assistants. T Th S, 12, Stimson Hall, Large Amphitheatre.

For students who expect to teach physiology in the secondary schools, and an introductory course for students of the biological sciences. A general review of the functions of the systems and organs of the human body, with introductory remarks on structure. The lectures will be fully illustrated by experiments, lantern slides, and diagrams, and periodical quizzes and examinations will be given.



6. **LABORATORY WORK IN PHYSIOLOGY.** First term, credit two hours. Professor SIMPSON and Assistants. Five hours a week, hours and days to be arranged, Stimson Hall, Practical Physiology Laboratory.

A beginning course in practical physiology. May be taken separately or along with course 3. In the laboratory the student is made to carry out for himself experiments which demonstrate the fundamental facts of the science, and he is taught to draw conclusions from these facts. All the apparatus required is supplied by the department.

7. **ADVANCED AND RESEARCH WORK IN PHYSIOLOGY AND BIOCHEMISTRY.** Throughout the year. Professor SIMPSON, Assistant Professors HUNTER and DRESBACH, and Assistants. Daily, Stimson Hall, Advanced Laboratory.

The physiological and biochemical laboratories in Stimson Hall are open daily from 9 to 5 for advanced work and research. Subjects for original investigation are suggested and direction and advice are freely given during the prosecution of the work. A weekly or fortnightly seminary is held at which results are discussed and criticized by members of the staff and other workers in the department.

9. **ELEMENTARY BIOCHEMISTRY.** Second term, credit five hours. Prerequisite courses Chemistry 6 and 32, or the equivalent. Assistant Professor HUNTER and Mr. GIVENS. T Th S, —, Stimson Hall.

Two lectures and three three-hour laboratory periods weekly supplemented by occasional demonstrations and reviews. Designed to give a practical acquaintance with the substances met with in living tissues, and to impart an elementary knowledge of the chemical changes underlying the processes of life. Practice in the qualitative and quantitative methods employed in the study of digestion, excretion, and metabolism.

## HISTOLOGY AND EMBRYOLOGY

1. **THE TISSUES : HISTOLOGY AND HISTOGENESIS.** First term, credit four hours. Prerequisite an elementary course in zoology, botany, or physiology. Professor KINGSBURY and Assistants. Lectures W F, 11; laboratory M W, 2-4.30, Stimson. The cell and cellular origin of the body, and the structure and development of its component tissues. A knowledge of general histological methods will be acquired and each student will make or receive a series of typical preparations.

2. **THE ORGANS : HISTOLOGY AND DEVELOPMENT.** Second term, credit four hours. Prerequisite course 1 or the equivalent. Professor KINGSBURY and Assistants. Lectures M F, 11; laboratory M W, 2-4.30, Stimson.

A continuation of course 1. Courses 1 and 2 give the fundamental facts of the histology and development of the body.

3. **SPECIAL HISTOLOGY AND TECHNIQUE.** First term, credit two or more hours. Prerequisite courses 1 and 2, or the equivalent. Professor KINGSBURY and Assistant ——. Laboratory at hours to be arranged, Stimson.

In this course a more detailed knowledge of histology and facility in technique are gained by practical work in one or more fields of histological work. Designed for those who desire a good working knowledge of histological methods for use in biology or medicine.

3a. **THE MICROSCOPE AND MICROSCOPIC METHODS.** First term, credit one hour. Professor KINGSBURY and Assistants. Laboratory work at hours to be arranged, Stimson.

Designed for those who desire a practical knowledge of the microscope and the accessory apparatus in preparation particularly for courses in bacteriology.

4. **EMBRYOLOGY.** Second term, credit three hours. Prerequisite course 1 or the equivalent. One lecture, demonstration, or recitation (T, 8) and two laboratory periods a week (hours to be arranged). Dr. HILTON.

The facts and factors in the development of animals, with special reference to the vertebrate group.

5. **THE NERVOUS SYSTEM AND SENSE ORGANS: HISTOLOGY AND DEVELOPMENT.** Credit two hours. Prerequisite course 1 or the equivalent. Laboratory work with demonstrations and quizzes. Professor KINGSBURY and Dr. HILTON. Stimson.

Designed for general students of zoology or those who are interested in anatomy and physiology and who desire a first hand knowledge of the structure and development of these organs.

7. **ADVANCED WORK IN HISTOLOGY AND EMBRYOLOGY.** Credit three hours or more. Prerequisite courses, 1, 2, 3, or the equivalent. Laboratory work with conferences at hours to be arranged. Professor KINGSBURY and Dr. HILTON.

Designed for those who are preparing theses for baccalaureate or advanced degrees, and for those who wish to undertake special investigations in histology and embryology.

8. **SEMINARY.** Throughout the year, credit one hour. Prerequisite courses, 1, 2; may be taken with course 3 or 7. Professor KINGSBURY. Hours to be arranged, Stimson.

For the discussion of current literature and the presentation of original work by the members of the department staff and those doing advanced work in the department.

## GEOLOGY

1. **ELEMENTARY GEOLOGY.** Throughout the year, credit three hours a term. Professors TARR, RIES, HARRIS, and GILL, and Messrs. PERRINE, STEWART, RICH, CLAYTON, and STORRER. Lectures T Th, 9, repeated T Th, 11, McGraw, Geological Lecture Room; one laboratory period a week, sections afternoons daily except Saturday, also probably Friday and Saturday mornings.

Planned to give beginners a knowledge of the fundamental principles and facts of geology by means of lectures, maps, lantern-slides, specimens, and field study. Students who intend to specialize in geology should take this course not later than their sophomore year.

2. **ELEMENTARY PHYSICAL GEOGRAPHY OR PHYSIOGRAPHY.** This course is divided into three parts: 2a, lectures; 2b, field and laboratory work; 2c, recitations. 2a must be accompanied by either 2b or 2c, or by both 2b and 2c. Students who intend to do further work in geology or physical geography should elect the combination 2a and 2b if time is not available to take all three. Excursions to Taughannock Falls and the Susquehanna Divide required of all members of the class. Voluntary excursions to Watkins Glen and Niagara Falls.

2a. Lectures. Throughout the year. Credit two hours a term. Professor TARR. M W, 9, McGraw. A study of the earth as a whole with special stress on the lands and a briefer consideration of the atmosphere and the oceans. A general account of the development of the main features of the earth and their influence on mankind. Illustrated by maps, models, and lantern slides.

2b. Field and laboratory work. Throughout the year. Credit one hour a term. M or T, 2-4.30, other periods if necessary, Physical Geography Laboratory. Messrs. VON ENGELN, RICH, and MORDOFF. Field excursions to points near the University; indoor laboratory work consisting of a study of the physiographic provinces of the United States, with experiments to illustrate the development of the simpler land forms.

2c. Recitations. Throughout the year. Credit one hour a term. F, 9, Physical Geography Laboratory, other periods if necessary. Recitations on lectures, or text-book assignments. Mr. VON ENGELN and Mr. ———.

3. **GEOGRAPHY OF NORTH AMERICA.** Throughout the year, credit two hours a term. Prerequisite course 2, or the equivalent. Professor TARR. T Th, 10, McGraw Hall, Lecture Room.



Lectures, quizzes, and examinations. The physiographic features of North America and their influence upon the history and industrial development of the various sections. Illustrated by lantern slides, maps, and models.

Courses 3 and 4 are given in alternate years.

[4. GEOGRAPHY OF EUROPE. Throughout the year, credit two hours a term. Prerequisite course 2, or the equivalent. Professor TARR.

Lectures, quizzes, and examinations. The physiographic features of Europe and their influence upon the history and industrial development of the several nations. Illustrated by lantern slides, maps, and models.

Courses 3 and 4 are given in alternate years.]

Not given in 1910-11.

5. PHYSIOGRAPHY OF THE LANDS. Throughout the year. Prerequisite course 2 or the equivalent. Professor TARR and Mr. ——. Students desiring to take this course should consult Professor Tarr as early as possible. Hours to be arranged. McGraw, Physical Geography Laboratory.

Lectures, quizzes, supplementary reading, field excursions, and laboratory work. Especially planned to meet the needs of prospective teachers of physical geography in the schools and of those who wish a more extensive study of the subject than is possible in a first year course.

Two Saturday excursions to distant points; a voluntary excursion of three days to the anthracite coal field at Wilkes-Barre and Hazelton for a study of the Appalachian mountains and the physiographic importance of the coal fields.

6. METEOROLOGY AND CLIMATOLOGY. Second term, credit three hours. Dr. WILSON. M W F, 10, Agricultural College.

Lectures, laboratory work, and weather observations. The general circulation of the atmosphere, development and movement of cyclones, tornadoes, and special storms, and conditions that attend them; practical weather maps and local observations, the use of meteorological instruments, general and special climatology, and its relation to agriculture.

7. GLACIAL PHYSIOGRAPHY. Second term, credit three hours. Prerequisite course 2. Professor TARR and Mr. ——. M W, 10, W, 2-4.30, McGraw, Physical Geography Laboratory.

A study of living glaciers and of the glacial period. Lectures and field work intended to show the effects of continental glaciation in North America, so clearly exhibited in the Ithaca region. One excursion each week in the spring, and two longer excursions to more distant points. In the winter the laboratory period will be devoted to reading, conference, and discussions of special topics.

8. EXPERIMENTAL PHYSIOGRAPHY. Throughout the year. Professor TARR and Mr. VON ENGELN. Hours to be arranged. McGraw.

Experiments by the individual students upon the origin and development of land forms. Amount of credit depends on nature and amount of work; in no case to be less than two hours throughout the year, or four hours for a single term.

9. SEMINARY. Throughout the year, credit two hours a term. Professor TARR. M, 4.30, McGraw, Physical Geography Laboratory.

Preparation and reading of reports upon special subjects, particularly upon investigations in the field. Abstracts and discussions of the current physiographic literature.

Open to undergraduates by special permission.

10. PHYSIOGRAPHIC INVESTIGATIONS. Throughout the year. Professor TARR.

Field and laboratory work with reading, conferences, excursions, and the presentation of reports. Original investigation based upon field work is undertaken by each student.

11. MINERALOGY. Throughout the year, credit three hours a term. Prerequisite at least the equivalent of Chemistry 1; more chemistry and some physics desirable. Professor GILL and Mr. GALPIN. Lectures, T Th, 8. Laboratory sections to be arranged. McGraw Geological Lecture Room.

For beginners who desire a general knowledge of the commoner minerals and their uses, or who intend to pursue advanced work in mineralogy or petrography. Elementary crystallography is a part of the course.

12. CRYSTAL MEASUREMENT AND DRAWING. Second term, credit two hours. Prerequisite course first term of 11. Professor GILL. Days to be arranged, McGraw, Mineralogical Laboratory.

Course 12 should be taken by students in course 11 who intend to continue in either course 14 or course 17. Laboratory measurements of crystals, with computation and drawing.

13. BLOWPIPE DETERMINATION OF MINERALS. First term, credit one hour. Prerequisite course 11. Professor GILL. One laboratory period Saturday morning, McGraw, Mineralogical Laboratory.

14. PHYSICAL CRYSTALLOGRAPHY. First term, credit three hours. Prerequisite course 11. Professor GILL. M W, and laboratory to be arranged. McGraw, Mineralogical Laboratory.

Especial attention is devoted to the optical properties of crystals.

15. PETROGRAPHY. Second term, credit three hours. Prerequisite courses 1, 11, 14. Professor GILL. M W, and laboratory to be arranged. McGraw, Mineralogical Laboratory.

Designed to give an elementary knowledge of the determination of minerals and rocks under the microscope.

16. SEMINARY IN MINERALOGY AND CRYSTALLOGRAPHY. Throughout the year, credit one hour a term. Prerequisite courses 11, 14. Professor GILL. Hours to be arranged, McGraw.

Devoted to the study either of current literature, or of some of the more important classics on the subject.

17. ADVANCED OR SPECIAL WORK IN MINERALOGY AND PETROGRAPHY. Throughout the year. Prerequisite courses dependent on nature of work. Professor GILL. Hours to be arranged, McGraw.

Adapted to the needs of the individual student.

22a. STRATIGRAPHIC GEOLOGY (Paleozoic). Second term, credit three hours. Prerequisite courses 1, or General Biology 1, or the equivalent. Professor HARRIS. M W F, 9 and 11, McGraw 23.

General stratigraphy and geographic distribution of the paleozoic systems throughout the world, with discussion of characteristic life forms. North American systems studied mainly in the field by week-end excursions to Little Falls, Syracuse, Rochester, Niagara, Waverly, and Wilkes-Barre.

For teachers and students of earth sciences in general.

[22b. STRATIGRAPHIC GEOLOGY (Mesozoic-Cenozoic). Second term, credit three hours.

Similar to 22a though dealing with the mesozoic and cenozoic systems, with fewer excursions and more laboratory work.]

Not given in 1910-11.

23a. PALEONTOLOGY (Protozoa-Molluscoidea). Second term, credit two hours. Prerequisite course 1, or General Biology 1, or the equivalent. Professor HARRIS. M W, 10 (or hour to be arranged), McGraw 23.

Designed to give students of general biology and geology a proper understanding of the relationship of common living and extinct types of life. Treatment purely biologic.



[23b. PALEONTOLOGY (MOLLUSCA TO VERTEBRATE.) Second term, credit two hours. Prerequisite course 1, or General Biology 1, or the equivalent. Professor HARRIS.

Similar to 23a but treating of the mollusca and higher life types. Lectures on plant evolution may also be here included.]

Not given in 1910-1911.

24. GEOLOGY CONFERENCE AND GENERAL RESEARCH. Second term. Professor HARRIS. Hours to be arranged, McGraw 23.

Advanced stratigraphic and paleontologic research, progress of research and current literature. The more advanced research work deals with the tertiary formations.

29. GEOLOGICAL EVOLUTION OF ORGANISMS. Throughout the year. Professor WILLIAMS. Hours to be arranged, McGraw, special laboratory, fourth floor.

Investigation of the evidences of evolution exhibited by selected groups of fossil organisms; preparation of thesis. Primarily for graduate students and advanced students in paleontology.

30. BUILDING STONES AND CLAY PRODUCTS. Second term, credit three hours. Professor RIES and Mr. STEWART. Lectures M W, 9. Laboratory either M or W, 10, McGraw.

The occurrence, distribution, and uses of building stones, and the applications of clay for structural products. Only by special permission may the lectures be taken without the laboratory work.

31. PRACTICAL GEOLOGY. Throughout the year, credit three hours a term. Registration by special permission. Professor RIES and Messrs. STEWART, KRAMM, and ——. Lectures M W, 11; laboratory work, M T W Th F, 2 and S 8, McGraw.

The practical application of geologic principles and the occurrence of such economic materials as are of importance to engineering students, the whole subject being treated with reference to their needs.

32. GENERAL ECONOMIC GEOLOGY. Throughout the year, three hours a term. Prerequisite, sufficient preparation in geology and mineralogy. Professor RIES, Mr. STEWART, and ——. Lectures M W, 10; laboratory T, 2, F, 9, or Th, 2, McGraw.

The origin, nature, distribution, and uses of the non-metallic, and metallic products of the earth's crust. First term, the non-metallics, including coal, oil, gas, clays, salt, fertilizers, etc. Second term, the metallic products, including the ores of iron, copper, lead, zinc, gold, silver, etc. Students may take lectures without laboratory only by special permission. A portion of the laboratory work may be replaced by field trips.

33. FIELD EXAMINATION OF MINERAL DEPOSITS. First term, credit two hours. Prerequisite course 32 or 31. Professor RIES. Hours to be arranged, McGraw.

Designed to acquaint the student with the methods used for examining deposits of economic value, with a view to determining their extent and character.

34. MINING OF MINERAL DEPOSITS. Two hours a term. Mr. KRAMM. Lectures, M W, 9. McGraw.

A general course describing the methods of mining deposits of economically valuable materials, and the relation between the origin and structure of the deposits and the methods used.

35. CLAY INVESTIGATION. Prerequisite, sufficient knowledge of geology and chemistry. Professor RIES. Hours to be arranged, McGraw.

Laboratory work, field work, and reading. Designed to familiarize the student with the character, occurrence, and applications of clays.

36. **ADVANCED ECONOMIC GEOLOGY.** Throughout the year. Prerequisite course 32. Professor RIES. Hours to be arranged, McGraw.

Laboratory, field work, and reading. The course varies with the needs of the individual student.

Primarily for graduates.

37. **ECONOMIC GEOLOGY SEMINARY.** Throughout the year. Professor RIES. T, 4.30, McGraw.

Abstracts and discussions of current literature, and preparation of papers on special subjects.

38. **SEMINARY IN FOREIGN LITERATURE.** Throughout the year, credit two hours a term. Prerequisite course 32. Professor RIES. Hours to be arranged, McGraw.

Reading and discussion of some of the more important foreign works on economic geology.

For graduates only.

39. **EXPERIMENTAL ECONOMIC GEOLOGY.** First term. Prerequisite courses 32 and Chemistry I, or the equivalent. Mr. STEWART. Hours to be arranged, McGraw.

Laboratory experiments demonstrating some of the general principles of ore deposition.

Primarily for graduates.

40. **BIBLIOGRAPHY OF ECONOMIC GEOLOGY.** First term, credit two hours. Prerequisite course 32. Mr. STEWART. Hours to be arranged, McGraw.

Lectures and discussions on the more important literature of economic geology.

Primarily for graduates.

## MILITARY SCIENCE AND TACTICS

1. **INFANTRY TRAINING AND INSTRUCTION.** Throughout the year. Captain PHILLIPS and Assistants. M W F, 4.45, Armory.

Practical and theoretical instruction, alternating according to the needs of the student, and to meet the varying conditions of season and climate.

A comprehensive course designed to equip the college man with such military instruction and training as will enable him to become an efficient company officer of volunteer infantry in time of war. Includes infantry drill; school of the soldier, company, batallion, and regiment; ceremonies; guard duty; position and aiming drills, gallery and target practice; minor tactics, advance and rear guard, outposts, and reconnoissance; camping and marching; first aid and sanitation; military bridges, roads, obstacles, and field entrenchments; military papers and company administration.

Required of all men in the four year courses. May be elected in lieu of physical training by men in the three year courses.

2. **ELECTIVE DRILL.** Throughout the year, credit two hours a term. Prerequisite course 1. Captain PHILLIPS and Assistants. M W F, 4.45, Armory.

An advanced course covering all phases of the practical work of the infantryman. May be elected by second year men of the four year courses in lieu of the required physical training.

3. **MILITARY SCIENCE.** Second term, credit two hours. Captain PHILLIPS. T Th, 12, Goldwin Smith.

Lectures and collateral reading. A purely theoretical course designed to give the student who is seeking a general liberal education such a knowledge of military science as will enable him intelligently to comprehend the military branch of government, military history, military affairs



in general, and their relation to the state and society. Of especial value to the student whose tastes are somewhat military, and who intends to keep up his military interests in connection with the National Guard or otherwise.

4. **BAND MUSIC.** Practical and theoretical instruction. Throughout the year, credit two hours a term. Mr. BRISSETTE. M W F, 4.45, Armory.

All instruments, music, uniforms, etc., are furnished by the University free of cost to the student. The members constitute the University Band.

Open to all students who have made a satisfactory beginning with any of the customary band instruments. Properly qualified students may substitute this course for either the required military drill (course 1), or the required physical training.

## PHYSICAL CULTURE

1. **PHYSICAL EXERCISES.** Throughout the year. Professor YOUNG and Assistants. Three days a week.

For those freshmen who, in the judgment of the Director, are physically unfitted for required military drill, and for all those who are allowed to substitute, for military drill, work in this department. Class and squad work; exercises prescribed for individual deformity and immaturity.

2. **PHYSICAL EXERCISES.** Throughout the year. Professor YOUNG and Assistants. Three days a week.

For sophomores who elect work in the department as part of the required work in physical training. Class and squad work; special exercises or work prescribed in one of the various branches of athletics under the general supervision of the department.

3. **PHYSICAL EXERCISES.** Throughout the year. Professor YOUNG and Assistants. Three days a week.

Elective for juniors and seniors. Class and squad work, or prescribed exercises.

4. **BOXING, WRESTLING, AND FENCING.** Throughout the year. Messrs. CONLEY, O'CONNELL, and GELAS. Daily except S, Gymnasium.

May be counted toward the required work of freshman and sophomore years, and toward work for which credit is given in the junior and senior years. A special fee of \$4.00 a term is charged for instruction in each branch.

5. **SWIMMING.** Throughout the year. Mr. VERWIEBE. Daily except S, 3, Gymnasium.

Required of all students who are unable to swim sixty feet. No student who is unable to satisfy this requirement will, unless excused because of physical disability, receive credit for work in the department.

10. **PHYSICAL TRAINING FOR WOMEN.** Throughout the year. Miss CANFIELD. Sage College.

Required of freshmen and sophomores.

11. **ADVANCED GYMNASTICS.** Throughout the year, credit two hours. Prerequisite course 10 or the equivalent. Miss CANFIELD. M T W Th F, 5.30, Sage College Gymnasium.

## SANITARY SCIENCE

A course of lectures on sanitary science and public health will be given throughout the year 1910-11. It is open to any student in the University that has the permission of his faculty to take the course. The lecturers who are invited to take part in the course are chosen as being particularly qualified, by experience, by education, and by research, to discuss the

special topics assigned to them, and the course as given is a remarkable presentation of the vital principles of sanitary science as directly affecting public health.

The course is devoted to a discussion of the relations between public health and state legislation, vital statistics, social problems, voluntary associations, epidemiology with special emphasis on tuberculosis, prophylaxis, quarantine, foods, including milk, the engineering of water supplies and of sewage disposal, housing and ventilation, and other similar questions, each topic requiring from one to six lectures.

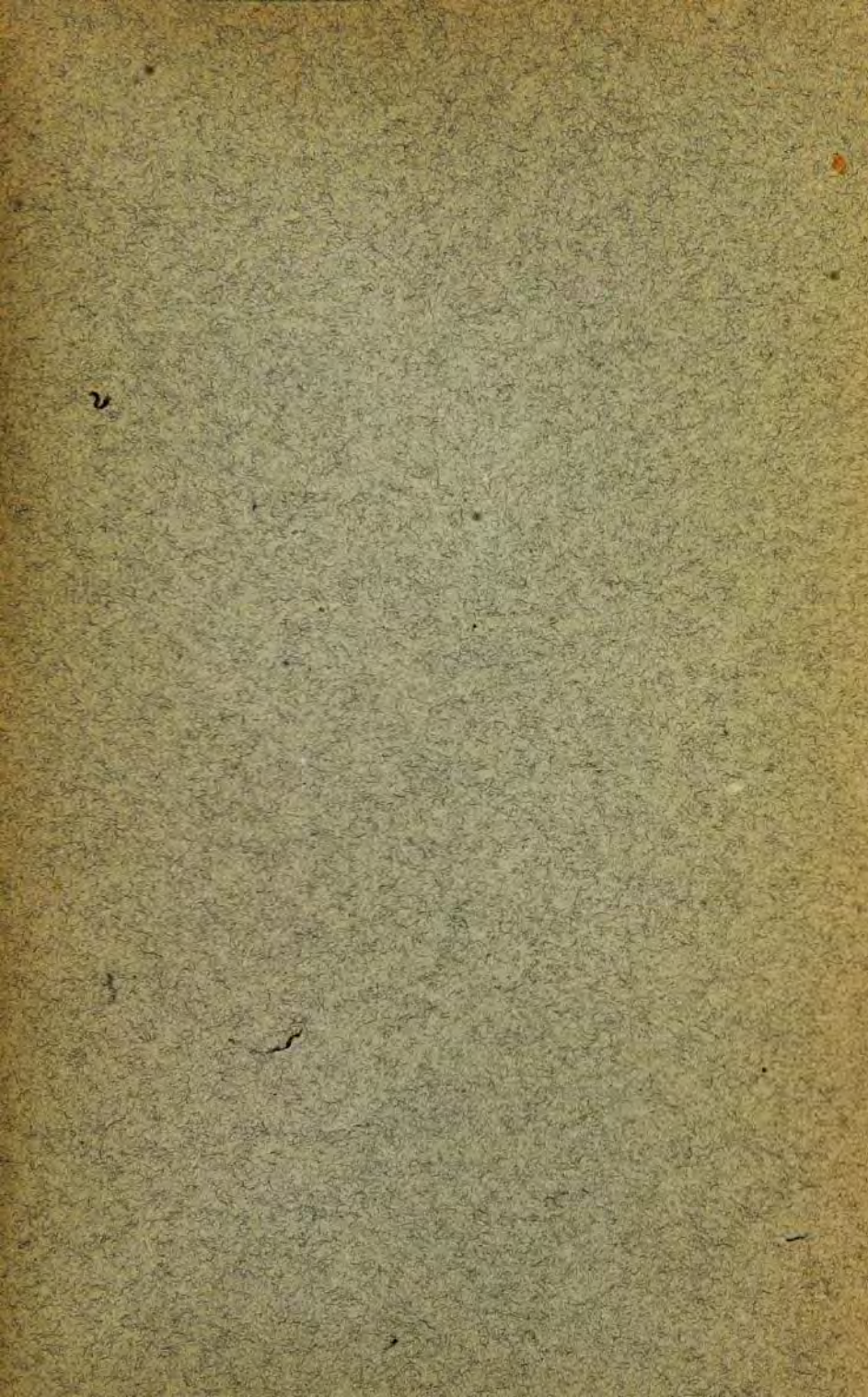
The course is made possible through the co-operation of the University with the State Department of Health. The lecturers are chosen in equal numbers from the members of the University Faculty and the staff of the State Department.

Freshmen in the College of Arts and Sciences may not elect this course. University credit of two hours is given to those students who register for the course and who comply with the requirements, and a special certificate is granted by the State Commissioner of Health to those who complete the course.

The course is under the direction of a committee consisting of Professors OGDEN, MOORE, and WILLCOX.

The lectures are held in Goldwin Smith, A, at 12 o'clock noon, on Tuesdays and Thursdays.







## OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

These publications include the annual Register, for which a charge of twenty-five cents a copy is made, and the following publications, any one of which will be sent gratis and post-free on request:

Circular of Information for prospective students,  
Announcement of the College of Arts and Sciences,  
Announcement of Sibley College of Mechanical Engineering and Mechanic Arts,  
Announcement of the College of Civil Engineering,  
Announcement of the College of Law,  
Announcement of the College of Architecture,  
Announcement of the Medical College,  
Announcement of the New York State College of Agriculture,  
Announcement of the New York State Veterinary College,  
Announcement of the Graduate School,  
Announcement of the Summer Session,  
The President's Annual Report,  
Illustrated Circular of Cornell University,  
Pamphlet on prizes, samples of entrance and scholarship examination papers, special departmental announcements, etc.

Correspondence concerning the publications of the University should be addressed to  
The Registrar of Cornell University,  
Ithaca, New York