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1926/27

**BULLETIN OF THE
UNIVERSITY OF NEW HAMPSHIRE**

**GRADUATE STUDY
1926-1927**



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BULLETIN OF THE UNIVERSITY OF NEW HAMPSHIRE

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The Bulletin is published in October, November, December, January, February, March and April, and includes:

- The Catalog of the University
- The Report of the President
- The Financial Report
- The Catalog of the Summer School
- The Illustrated Booklet

and other publications of the University.

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1926/27

THE UNIVERSITY CALENDAR

1926-1927

FALL TERM

1926

Sept. 14	Tuesday	Matriculation Day—Freshman class
Sept. 20	Monday	Registration Day—Upper classes
Sept. 21	Tuesday	Recitations begin at 8 A.M.
Oct. 13	Wednesday	Annual Meeting of Board of Trustees
Nov. 1	Monday	Mid-Term Warnings to be filed, 5 P.M.
Nov. 23	Tuesday	Thanksgiving recess begins at 6 P.M.
Nov. 29	Sunday	Thanksgiving recess ends at 8 P.M.
Dec. 17-23	Fri.—Thurs.	Fall Term Examinations
Dec. 23	Thursday	Fall Term closes at 4 P.M.

WINTER TERM

1927

Jan. 3	Monday	Registration Day
Jan. 4	Tuesday	Recitations begin at 8 A.M.
Jan. 12	Wednesday	Meeting of Board of Trustees
Feb. 14	Monday	Mid-Term Warnings to be filed, 5 P.M.
Feb. 22	Tuesday	Washington's Birthday (Holiday)
Mar. 8	Tuesday	Town Meeting—classes dismissed at 10 A.M.
Mar. 17-23	Thurs.—Wed.	Winter Term Examinations
Mar. 23	Wednesday	Winter Term closes at 4 P.M.

SPRING TERM

1927

Mar. 31	Thursday	Registration Day
Apr. 1	Friday	Recitations begin at 8 A.M.
Apr. 13	Wednesday	Meeting of Board of Trustees
May 9	Monday	Mid-Term Warnings to be filed, 5 P.M.
May 23-25	Mon.—Wed.	Military Encampment and Inspection
May 30	Monday	Memorial Day (Holiday)
June 13-17	Mon.—Fri.	Spring Term Examinations
June 15	Wednesday	Senior Examinations close, 4 P.M.
June 18	Saturday	Class Day and Alumni Day
June 18	Saturday	Meeting of Board of Trustees
June 19	Sunday	Baccalaureate Day
June 20	Monday	Commencement Day

BOARD OF TRUSTEES

HIS EXCELLENCY GOVERNOR JOHN G. WINANT, M.A.,	<i>ex officio</i>
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MISS ELIZABETH C. SAWYER,	Dover
*HON. ALBERT H. BROWN, B.S.,	Strafford

*Elected by the Alumni.

FACULTY FOR GRADUATE STUDY

OFFICERS OF ADMINISTRATION

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CHARLES H. PETTEE, C.E., LL.D., *Dean of the Faculty*

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GRADUATE BULLETIN

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UNIVERSITY OF NEW HAMPSHIRE

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GRADUATE STUDY AND ADVANCED DEGREES

The administration of graduate work of the University is in charge of the Graduate Committee.

ADMISSION

All inquiries concerning admission to graduate study should be directed to the Chairman of the Graduate Committee. Because of the limited number of graduate subjects offered during any one term, prospective students should confer with the head of their major department as early as possible regarding their course of study, and make application for admission previous to the time of registration.

A graduate who holds a Bachelor's degree or its equivalent from an approved college or university will be admitted to graduate study, and may register for such graduate subjects as he is prepared to take. In general, a student must have not less than 90 time units,* or the equivalent, in the department in which he wishes to major.

A student lacking one or more undergraduate subjects which may be prerequisite for graduate study may register in the undergraduate colleges for these subjects, but he will receive no graduate credit for them. A college graduate who desires to take subjects carrying only undergraduate credit should register as a special student in the college giving those subjects.

REGISTRATION

The student desiring to register for graduate study must present his credentials to the Chairman of the Graduate Committee.

In consultation with his major professor, the student must fill out the required forms for graduate study.

The student must deposit these blanks with the Chairman of the Graduate Committee. When such cards are approved, the student, after paying his fees at the Business Office, must deposit the cards with the Registrar.

TUITION AND FEES

Tuition is \$75 a year for residents of New Hampshire, and \$150 for non-residents; incidental fees are \$54.50 a year. One third of the tuition fee is payable in advance on the first of each term.

Incidental fees are payable in advance, \$20 the first term and \$15 for

* A time unit is one hour a week of student work in class or in preparation.

UNIVERSITY OF NEW HAMPSHIRE

each of the other two terms. A diploma fee of \$5 is charged upon graduation. Charges will be assessed for extraordinary breakage or damage. No laboratory or course fees are charged. Payment of the incidental fees entitles the student to admission to all varsity athletic games and contests.

"Members of the regular college staff and their immediate families electing college work shall not be required to pay tuition charges. Scholarships shall be granted to those registering for 30 or more time units."

"Members of the regular college staff and their immediate families registering for less than 30 time units of college work shall be required to pay such part of the general fees as the *credit hours elected shall bear* to 50 time units. The payment of such fee, unless it amounts to the total fee, shall not entitle them to athletic tickets."

BOOKS

The students may purchase books, drawing instruments, materials, etc., at the University bookstore in Thompson Hall.

ROOMS

The University has four dormitories for women and five for men. All rooms are heated, lighted and furnished. Bed linen, quilts and towels, however, are provided by the individual student. Each women's dormitory is equipped with a laundry. In many cases three students occupy a suite of rooms. Prices range from \$63 to \$100 a year for each student. Applications for rooms in the dormitories should be addressed to The Registrar, University of New Hampshire, Durham, N. H.

A deposit of five dollars must accompany each application for a room, this deposit to be forfeited if the room accepted is not occupied by the applicant. The deposit is held as a guarantee against breakage, and will be returned upon the payment of any bills for damage at the close of the year, or upon the applicant's withdrawal from the University.

Reservation for rooms will be cancelled ten days before the registration date noted in the current college catalog unless one-third of the annual rent has been paid before that date.

Rooms paid for and not accepted one day after registration will be declared vacant and the room rent returned, unless the individual having the reservation makes a written request to the Registrar to hold the room until a later date. The advance payment of the room will not be returned to those making this special request. No rooms will be re-

GRADUATE BULLETIN

served more than ten days after the registration date. Early application is necessary in order to secure a choice of rooms. Rooms may be secured in private houses for about the same prices as for those in college dormitories.

Women students, unless living at home, are required to room in the women's dormitories, or in approved houses. A competent matron is in charge of each women's dormitory.

BOARD

The University operates on a self-service basis a modern, well-appointed Commons. Both regular weekly board and cafeteria service are provided. Exact cost records are kept, and prices are adjusted in such manner as to give students the advantage of changing costs.

UNIVERSITY AIDS TO STUDENTS

Scholarships and Loan Funds.—A limited number of scholarships are awarded annually for the purpose of aiding deserving students. Recently, owing to the large increase in student attendance, all scholarships thus far provided have been utilized. However, the trustees are anxious to supply scholarships to as many as possible of the really needy young men and women in New Hampshire. In order to do this most equitably, they require full information of all applicants relative to the necessity for scholarship aid. Scholarship application blanks will be provided, upon request, by the Dean of the Faculty.

These scholarships will be forfeited by the student at any time for misconduct.

In general, scholarships granted to graduate students will be treated as loans on interest after graduation.

GRADUATE ASSISTANTSHIPS

Graduate assistantships which usually require half-time service are available in a number of the departments. Inquiries regarding these assistantships should be addressed to the head of the department concerned.

GRADUATE WORK IN THE SUMMER SESSION

Graduate work done in the summer session of the University may be credited towards an advanced degree. The residence requirement for the Master's degree may be completed in not less than four summer sessions. Graduate work in fields of special interest to high school

UNIVERSITY OF NEW HAMPSHIRE

teachers and superintendents is offered in the summer session, and may be found listed in the bulletin of the summer school.

Students taking graduate work in the summer session must register with the Chairman of the Graduate Committee.

ADVANCED DEGREES

Two types of advanced degrees are conferred: (a) Master of Science and Master of Arts, given only in course, and (b) the professional degrees, Mechanical Engineer and Electrical Engineer, conferred only upon graduates of this institution, and based upon the quality of their professional work and the presentation of a satisfactory thesis. Complete information in regard to these degrees is given in the general catalog of the University.

REQUIREMENTS FOR THE MASTER'S DEGREE

Residence.—A minimum of one full academic year or four summer sessions in residence is required. If a graduate student is serving as a member of the instructional staff or of the experiment station staff, the Master's degree cannot be earned in less than two years, of which at least one year or four summer sessions must be in residence, and then only upon completion of the other requirements for the degree.

Credits.—A minimum of 150 time units (50 units each term) is required, of which not less than 80 or more than 100 shall be devoted to a major subject and a thesis, and not less than 30 or more than 50 to a minor subject. Work in allied departments may be accepted as part of the major requirements if such work is properly correlated with the major subject. Not over 50 units may be given for a thesis, and at least 50 units must represent work regularly scheduled in classes. Of the total time units, not more than half will be accepted from another institution.

Selection of Thesis Subject.—Not later than six months previous to the time the degree is sought, the candidate must file with the Graduate Committee for their approval a statement of the thesis subject as approved by the head of the major department. The same time limit applies to the filing of an application for admittance to candidacy for the degree.

Approval of Candidacy.—At least three months previous to the time

GRADUATE BULLETIN

of granting the degree, an application for admittance to candidacy for the degree, properly approved by the head of the major and minor departments, must be submitted to the Graduate Committee for their approval.

Examinations.—All candidates must meet the regular requirements as to examinations in the subjects for which they are registered. Before a candidate may be recommended for the Master's degree, he must pass an oral examination before a special committee designated by the Graduate Committee and including the heads of the departments in which the major and minor subjects have been taken. At least four weeks previous to the date at which the degree is sought, an application for examination, approved by the head of the major and minor departments, must be filed with the Graduate Committee.

Thesis.—The thesis must be typewritten upon standard paper, eight and one-half by eleven inches, medium weight, neatly bound in black cloth, and gilt-lettered on the first cover with title, name of author, degree sought, and year of graduation. The title page should bear the following statement:

"A thesis submitted to the University of New Hampshire in partial fulfillment of the requirements for the degree of Master of Arts (Master of Science)."

Whenever a thesis is printed in any periodical, it must be designated as having been accepted as a Master's thesis by the University of New Hampshire.

Two bound copies must be filed before Commencement Day, one with the Librarian and one with the head of the department in which the major work is done.

TABULAR SUMMARY OF REQUIREMENTS FOR THE MASTER'S DEGREE

<i>Work</i>	<i>Under Direction of</i>	<i>Date</i>
Course of study	Heads of major and minor departments and Graduate Committee	On entrance
Approval of thesis subject	Head of major department and Graduate Committee	Not later than six months prior to the time the degree is sought
Approval of candidacy	Heads of major and minor departments and Graduate Committee	Not later than six months prior to the time the degree is sought
Application for final examination	Heads of major and minor departments and Graduate Committee	Four weeks prior to the time the degree is sought
Fee for binding thesis	Business Office	One week before Commencement

DESCRIPTION OF SUBJECTS

(Alphabetically arranged)

No subject will be accepted for graduate credit that is not designated by the letter "G" on the Registrar's records.

Credits for the thesis shall be recorded in the registrar's office as "Thesis Credits."

Graduate credit may be given for subjects not listed in the catalog if recommended by the major and minor departments concerned, and approved by the Graduate Committee.

A graduate student taking a subject for graduate credit which is not primarily for graduates may be required to do additional work above that required of undergraduate students.

Prerequisites for the subjects that are described in the catalog are stated with reference to subject numbers of the general catalog of the University.

AGRICULTURAL CHEMISTRY

T. G. PHILLIPS, *Professor*

S. R. SHIMER, *Instructor*

In order to major in this department, students must have credit in General Chemistry, Qualitative Analysis, Organic Chemistry, Quantitative Analysis, Physical Chemistry and the biological sciences.

It is desirable that candidates for the Master's degree have a reading knowledge of German or French.

4-b. Physiological Chemistry. 8 units.

5-c. Physiological Chemistry. 8 units.

6-a. Plant Chemistry. 8 units.

7-a, 8-b, 9-c. Agricultural Analysis. 10 units each.

19-c. Dairy Chemistry. 8 units.

For description and prerequisites for the preceding subjects, see general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

10-a, 11-b, 12-c. Advanced Biochemistry.

This is a special problem course. It consists of library and laboratory work and discussions on such topics as the analysis of proteins and fats,

UNIVERSITY OF NEW HAMPSHIRE

the preparation, structure and properties of carbohydrates, and physico-chemical methods in Biology. Credit to be arranged.

16-a, 17-b, 18-c. Seminar. 3 units each.

AGRONOMY

FREDERICK W. TAYLOR, *Professor*

M. GALE EASTMAN, *Associate Professor*

19-a. Agricultural Marketing. 8 units.

9-b. Agricultural Statistics. 7 units.

10-c. Types of Farming. 7 units.

For description and prerequisites of the preceding subjects, see general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

20-b. **Farm Management and Accounting.** Textbook, lectures, and laboratory work relating to the development, organization, and management of the farm. The theory and practice of farm cost-accounting together with the factors underlying the development of specific types of farming will be studied. Open for students who have not had Farm Management 8-a or Farm Accounting 7-c. Lectures and recitations, 3 units; laboratory, 3 units; preparation, 9 units. Total, 15 units.

21-c. **Advanced Farm Management.** Problems in correlation, tabulation and farm accounting. Intended for those who are interested in research or demonstration work. Accounts on individual farms will be kept and surveys made. Laboratory, 2 units; preparation, 5 units. Total, 7 units.

22-a. **History of Agriculture.** Lecture and library work upon the history and development of agriculture from early Egyptian to modern times. Special attention will be given to such factors as soil, climate, crops, machinery, laws, and character of the people, which have affected this development. Lecture, 1 unit; preparation, 3 units. Total, 4 units.

GRADUATE BULLETIN

ANIMAL HUSBANDRY

JOHN C. McNUTT, *Professor*

To major in Animal Husbandry the student must have had credit in general Animal Husbandry as required for undergraduate students specializing in Animal Husbandry.

- 9-c. Sheep and Swine Husbandry. $8\frac{1}{2}$ units.
- 10-b. Management of Horses and Beef Cattle. $8\frac{1}{2}$ units.
- 12-c. Animal Husbandry Seminar. $5\frac{1}{2}$ units.
- 13-c. Principles of Nutrition. $5\frac{1}{2}$ units.

For description and prerequisites of the preceding subjects, see general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

15-a. **Advanced Livestock Judging.** A systematic study of animal structure to determine the conformation resulting in greatest efficiency for purpose intended; to show standards and methods of judging; to correlate production tests with conformation. $12\frac{1}{2}$ units.

16-b. **Advanced Animal Nutrition.** A careful study of the more recent work in animal nutrition which has a direct bearing on the growth, reproduction and efficiency of our domestic animals. $12\frac{1}{2}$ units.

17-c. **Advanced Animal Breeding.** A careful study of the modern work in genetics as applicable to livestock breeding. $12\frac{1}{2}$ units.

ARCHITECTURE

ERIC T. HUDDLESTON, *Professor*

CHESTER E. DODGE, *Instructor*

Architectural Construction. The department offers, as a major, work leading to the degree of Master of Science and Master of Arts for those who have completed a standard four-year course in Architectural Construction or Architecture substantially equivalent to that required of undergraduates in this institution.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

101-a, 102-b, 103-c. **Architectural History.** A special research coördinated with the major subject elected. 8 units.

UNIVERSITY OF NEW HAMPSHIRE

136-a, 137-b, 138-c. Structural Design. The design of special structures involving problems in reinforced concrete and steel frame construction. 25 units each.

150-a, 151-b, 152-c. Architectural Design. The "Class A program of design problems of the Beaux Arts Institute of Design" will be followed throughout the year. 25 units each.

BOTANY

O. R. BUTLER, *Professor*

MABEL M. BROWN, *Assistant Professor*

F. R. CLARK, *Assistant Professor*

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

20-a, 21-b, 22-c. Seminar. 1 unit each.

23-b. Fungicides. Preparation and use of fungicides and a study of their effect upon the higher plants and the organisms parasitic upon them. 8 units.

23-b and 24-b are given in alternate years.

24-b, 25-c. Advanced Plant Physiology. Mechanics of growth; influence of external conditions on growth; absorption and translocation; the food of plants; constructive and destructive metabolism; respiration and fermentation. 8 units each.

24-b and 25-c are given in alternate years with 23-b.

26-a. Plant Genetics. Lectures and readings on heredity, including Mendelism, neo-Mendelism, mutation and the chromosome theory with special reference to plants. 8 units.

27-b. Soil Bacteriology. A study of soil organisms and their economic importance in relation to soil fertility. $8\frac{1}{2}$ units.

27-b and 28-c are given in alternate years.

28-c. Immunity and Infection. A course of lectures, recitations and readings on susceptibility, resistance and immunity. $8\frac{1}{2}$ units.

28-c and 27-b are given in alternate years.

GRADUATE BULLETIN

CHEMISTRY

CHARLES JAMES, *Professor*

GEORGE A. PERLEY, *Associate Professor*

Graduate work in Chemistry is open to those who have completed the Chemistry Course of either the College of Liberal Arts or the College of Technology, or some similar course of study. Excellent opportunities are offered for research in General and Analytical Chemistry, and the metallurgy of rare metals.

60-a, 61-b, 62-c. **Physical Chemistry.** Rec., 3 units; prep., $4\frac{1}{2}$ units; total, $7\frac{1}{2}$ units.

80-a, 81-b, 82-c. **Advanced Inorganic Chemistry.** Rec., 2 units; lab., $2\frac{1}{2}$ units; prep., 3 units; total, $7\frac{1}{2}$ units.

110-a, 111-b, 112-c. **Industrial Chemistry.** Rec., 3 units; prep., $4\frac{1}{2}$ units; total, $7\frac{1}{2}$ units.

63-b, 64-c. **Physical Chemistry Laboratory.** Lab., 5 units; prep., 2 units; total, 7 units.

For description and prerequisites for the preceding subjects, see general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

301. **Practical Spectroscopic Analysis.** The subject matter includes a study of absorption, spark, arc and phosphorescent spectra, together with the procedure for the detection of the rarer elements, the preparation of vacuum tubes, and the calibration of a spectroscope. Lab., $7\frac{1}{2}$ units; total, $7\frac{1}{2}$ units.

302, 303, 304. **General Chemistry.** This will cover certain selected topics. Rec., 2 units; lab., $2\frac{1}{2}$ units; prep., 3 units; total, $7\frac{1}{2}$ units.

305. **History of Chemistry.** Rec., 3 units; prep., $4\frac{1}{2}$ units; total, $7\frac{1}{2}$ units.

306, 307, 308. **Quantitative Analysis.** The complete analysis of complex minerals, and determinations presenting more than ordinary difficulties. Lab., $7\frac{1}{2}$ units. Total, $7\frac{1}{2}$ units.

309, 310. **Chemistry of the Rarer Elements.** An introduction to this field of chemistry. Rec., 2 units; lab., $2\frac{1}{2}$ units; prep., 3 units; total, $7\frac{1}{2}$ units.

UNIVERSITY OF NEW HAMPSHIRE

DAIRY HUSBANDRY

JOHN M. FULLER, *Professor*

HEBER F. DEPEW, *Assistant Professor*

Students who plan to major in dairy husbandry should have undergraduate training substantially equivalent to that required of undergraduate students in dairy husbandry at this institution.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

14-a, 15-b, 16-c. **Advanced Dairy Husbandry Problems.** Systematic studies of dairy husbandry problems from the standpoint of the producer. 15 units each.

17-a, 18-b, 19-c. **Advanced Dairy Manufacturing Problems.** Systematic studies of dairy manufacturing problems from the standpoint of the dairy manufacturer. 15 units each.

ECONOMICS

HARRY W. SMITH, *Professor*

ARTHUR W. JOHNSON, *Assistant Professor*

NORMAN ALEXANDER, *Assistant Professor*

General provisions governing graduate study in the Department of Economics.

GENERAL GRADUATE CREDIT.

In addition to work offered for major and minor credit, the following courses are offered for general credit but not for credit toward a major or minor.

Economics 71-a, 72-b, 73-c. Commercial Law. For prerequisites and description see general University catalog.

MAJOR AND MINOR.

Students wishing to major in this department are expected to have had three years of work in Economics as a prerequisite.

Students wishing to minor in this department are expected to have had two years of work in Economics as a prerequisite.

GRADUATE BULLETIN

THESIS.

Students majoring in this department are expected to write their thesis on a subject within the field of historical Economics.

Pursuant to the above conditions the following courses are offered for credit toward a major or minor.

10-a. Labor Problems. 10 units.

14-b. Money and Banking. 9 units.

22-a. Corporations. 9 units.

26-b. Transportation. 10 units.

30-a. Public Finance. 10 units.

34-a, 35-b. History of Economics. 9 units.

40-a, 41-b, 42-c. Seminar in Current Economic Problems. 9 units each.

54-b. Corporation Finance. 9 units.

118-a, 119-b, 120-c. Advanced Accounting. 10 units each.

For prerequisites and description of the above subjects, see general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

43-a, 44-b, 45-c. Advanced Seminar in Economic Investigation. May be offered in connection with allied departments. 9 units each.

EDUCATION

JUSTIN O. WELLMAN, *Professor*

VERNON L. MANGUN, *Assistant Professor*

ADOLPH G. EKDAHL, *Assistant Professor*

*WALTER A. PIERCE, *Instructor in Industrial Education*

*CLAIBORNE H. YOUNG, *Instructor in Agricultural Education*

The principal aim of graduate work in the Department of Education is the development of the ability to do independent work, and the promotion of the spirit of research. Each candidate for a degree is expected to have a wide knowledge of his subject and of related fields of work.

*Representing the State Department of Education in the administration of the Smith-Hughes Act.

UNIVERSITY OF NEW HAMPSHIRE

EDUCATION

- 14-b. Secondary Education. 9 units.
- 15-c. Class-room Management and Methods. 9 units.
- 16-a, b, c. Supervised Teaching. 6 to 50 units.
- 17-b. High School Administration. 9 units.
- 20-a. History and Principles of Vocational Education. 9 units.
- 26-c. Junior High School Education. 9 units.
- 28-b. Hygiene of the School Child. 9 units.
- 29-c. New Hampshire State Program of Studies and School Law.
9 units.
- 34-b. Educational and Vocational Guidance. 9 units.
- 35-b. Agriculture in the High School. 9 units.
- 36-c. Supervised Teaching in Agriculture. 50 units.

For description and prerequisites of the preceding subjects, see general catalog of the University.

TRADE AND INDUSTRIAL EDUCATION

- 40-b. Special Methods in Industrial Education. 9 units.
- 41-c. Supervised Teaching in Industrial Education. 6 to 50 units.
- 50-a. School Administration. 9 units.
- 52-a, 53-b, 54-c. Educational Problems. To be arranged.

For description and prerequisites of the preceding subjects, see general catalog of the University.

APPLIED PSYCHOLOGY

(See also Philosophy and Psychology.)

- 5-c. Psychology of Learning. 9 units.
- 4-a. Genetic Psychology. 9 units.
- 6-a. Measurements and Statistics. 9 units.
- 8-a. Applied Psychology. 9 units.
- 9-b. Psychology of Adolescence. 9 units.

GRADUATE BULLETIN

10-a. **Psychology Applied to Commerce and Industry.** 9 units.

30-a, 31-b, 32-c. **Special Problems in Psychology.** To be arranged.

For description and prerequisites of the preceding subjects, see general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

101-a, 102-b, 103-c. **Seminar.** Research in education or psychology. Students who wish to carry on investigations of a documentary, experimental or statistical nature should enroll for this subject.

Special problems may be carried over two or more terms. To be arranged.

ELECTRICAL ENGINEERING

L. W. HITCHCOCK, *Professor*

In order to major in the department, a student must have completed all undergraduate Electrical Engineering subjects required in the undergraduate Electrical Engineering Course.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

31-a. **Engineering Problems.** The analysis and solution of problems of an advanced nature. $7\frac{1}{2}$ units.

32-b. **Illumination.** A study of the latest development in incandescent lamps, shades and reflectors, with their applications. $7\frac{1}{2}$ units.

33-c. **Storage Batteries.** The causes and remedies for battery failure. The practical application of the storage battery both for stationary and automotive purposes. $7\frac{1}{2}$ units.

34-a. **Radio Communication.** Vacuum tube characteristics and applications. Transmitting and receiving circuits and their phenomena. $7\frac{1}{2}$ units.

35-b. **Plant Economy.** A study of a plant already in operation, to determine possible improvements in equipment and methods. $7\frac{1}{2}$ units.

36-c. **Design.** The design of electrical machinery, plant equipment or plant layout. If desired, this subject may supplement E. E. 35-b. $7\frac{1}{2}$ units.

UNIVERSITY OF NEW HAMPSHIRE

ENGLISH

ALFRED E. RICHARDS, *Professor*

HAROLD H. SCUDDER, *Associate Professor*

CLAUDE T. LLOYD, *Assistant Professor*

The candidate must have a reading knowledge of at least two modern languages exclusive of English, preferably French and German.

20-a, -b. **Seventeenth Century English Literature.** Lectures, 3 units; preparation, 6 units. Total, 9 units each.

22-b. **English Novel.** Lectures, 3 units; preparation, 7½ units. Total, 10½ units.

28-b, 29-c. **Shakespeare's Plays.** Lectures, 3 units; preparation, 6 units. Total, 9 units each.

85-a, 86-b, 87-c. **The English Language.** Lectures, 3 units; preparation, 6 units. Total, 9 units each.

For prerequisites and descriptions of the preceding courses, see the general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

101-a, 102-b, 103-c. **Collateral Reading.** This is a seminar course in the masterpieces of world literature. It includes the reading and the discussing of selected epics, dramas, novels and essays, and the writing of a 2000-word term paper upon some phase of the literature studied. Lectures, 3 units; preparation, 9 units. Total, 12 units each term.

ENTOMOLOGY

W. C. O'KANE, *Professor*

P. R. LOWRY, *Assistant Professor*

The student who plans to pursue advanced work in Entomology will be expected to present a broad foundation of underlying sciences, including especially subjects in Zoölogy, Chemistry, Botany, and Plant Pathology. A working knowledge of Bacteriology is desirable.

The Department does not attempt to give a full course of professional training in Entomology within the four years of undergraduate college work, but presupposes that the student will lay his foundations and begin his specialization within that period, continuing his study of advanced Entomology as a graduate student.

GRADUATE BULLETIN

2-a. **Insects of Orchard and Garden.** Lectures and recitations, 2 units; laboratory, $2\frac{1}{2}$ units; preparation, 3 units. Total, $7\frac{1}{2}$ units.

3-b. **Insects of Domestic Animals.** Lectures and recitations, 2 units; laboratory, $2\frac{1}{2}$ units; preparation, 3 units. Total, $7\frac{1}{2}$ units.

4-c. **Household Insects.** Lectures and recitations, 2 units; laboratory, $2\frac{1}{2}$ units; preparation, 3 units. Total, $7\frac{1}{2}$ units.

5-a, 6-b, 7-c. **Advanced Economic Entomology.** Units and hours to be arranged.

8-a, 9-b, 10-c. **Advanced Economic Entomology.** Units and hours to be arranged.

13-c. **Forest Insects.** Lectures and recitations, 2 units; laboratory, $2\frac{1}{2}$ units; preparation, 3 units. Total, $7\frac{1}{2}$ units.

For description and prerequisites of the preceding subjects, see general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

14-a, 15-b, 16-c. **Graduate Entomology.** Prerequisites, Entomology 5-a to 7-c, or the equivalent. Units and hours to be arranged.

17-a, 18-b, 19-c. **Entomological Seminar.** Prerequisite, Entomology 5-a to 7-c, or the equivalent. Units and hours to be arranged.

FORESTRY

K. W. WOODWARD, *Professor*

C. L. STEVENS, *Assistant Professor*

Before commencing graduate work in Forestry, a student will be required to have completed work in Dendrology, Silviculture, Forest Management and Forest Practice similar in content and amount to those now required of undergraduates majoring in Forestry at this institution.

10-a, 11-b, 12-c. **Advanced Forestry.** 9 units each.

For description and prerequisites of the above subjects, see general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

101, 102, 103. **Forest Ecology.** A study of the local problems of forest distribution. 9 units each.

UNIVERSITY OF NEW HAMPSHIRE

104, 105, 106. **Advanced Forest Utilization.** The detailed study of local wood-using industries. 9 units each.

HISTORY AND POLITICAL SCIENCE

DONALD C. BABCOCK, *Professor*

THORSTEN KALIJARVI, *Assistant Professor*

HISTORY

No student is expected to do his major work in History unless he proposes to write his thesis on some phase of New England history, preferably that of New Hampshire. For this purpose the facilities for research are considerable, including the Library of the University, the State Historical Library in Concord, and various town records, private documents, uncollected letters, unrecorded personal memoirs, landmarks, etc. A part of the work of this department is conceived to be the discovery and conservation of the source material existing in the mental and material accumulations of the older type of New England people and in their homes. The major graduate student is expected to enter into the spirit of this permanent departmental project, and add his contribution.

SUBJECTS PRIMARILY FOR UNDERGRADUATES, BUT IN WHICH GRADUATE CREDIT MAY BE SECURED

Graduate credit in the subjects listed in the University catalog as primarily for undergraduates may be secured in most cases by arrangement with the head of the department and the Graduate Committee. Graduate credit, when the work is taken in class with undergraduates, implies certain higher standards of quality as well as a greater quantity,

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

1-a. **New England History to the Revolutionary Period.** This subject takes up the European background of New England, the origins of the separate New England colonies, and the development of their distinguishing traits. 12 units, or more by arrangement.

2-b. **New England History from the Opening of the Revolutionary Period to about 1820.** This subject emphasizes, among other considerations, the part played by New England in the struggle for independence, and its contribution to the foundations of the new nation. 12 units, or more by arrangement.

GRADUATE BULLETIN

3-c. New England History since 1820. Deals partly with the influence of New England upon the rest of the country, and partly with the internal changes in New England in the nineteenth and twentieth centuries. 12 units, or more by arrangement.

4-a, 5-b, 6-c. Seminar or Research in New Hampshire History. Selected topics will be assigned for individual investigation, such as transportation routes, rural decline, the development of the mill town, etc. The relation to a possible rejuvenation of New Hampshire life will be kept in mind throughout these courses. 12 time units each, or more by arrangement.

POLITICAL SCIENCE

A student entering this field for his major work should have acquired a sufficient background to enable him to utilize the fundamentals of American and European history, social theory, and economics, and he should have had either French, German, or Spanish. He must take 121-a, 122-b, 123-c, and also, if he has not already taken them, 101-a, 102-b, 103-c.

Since research work must be based on original sources, the student majoring in political science should choose the subject of his dissertation from one or the other of the following fields:

- I. American (preferably New England or New Hampshire) Politics and Political Theories.
- II. International Law and Foreign Relations.

A graduate student may not elect any of the subjects in Group I of the regular University catalog in Political Science, except 101-a, 102-b, 103-c. Groups II and III are open to him. In Groups I and II the graduate student is expected to do considerably more work than is required of the undergraduate.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

119-a, 120-b, 121-c. Political Theory. From 5 to 15 units.

122-a, 123-b, 124-c. Seminar. 5 units.

125-a, 126-b, 127-c. Research and Thesis. Credit to be arranged.

1-a, 2-b, 3-c. Advanced International Law. To meet two successive hours once a week, and to be given only by arrangement and upon sufficient demand. It will deal chiefly with the Hague Arbitration Court, the Permanent Court of International Justice, recent attempts at codification, and prize cases. 10 units.

UNIVERSITY OF NEW HAMPSHIRE

SUBJECTS PRIMARILY FOR UNDERGRADUATES

- 101-a, 102-b, 103-c. History of Political Theories. 8 units each.
113-a, 114-b, 115-c. International Law. 12 units each.
116-a, 117-b. Comparative Government. 12 units each.
118-c. Introduction to Jurisprudence. 12 units.

HORTICULTURE

GEORGE F. POTTER, *Professor*

J. RAYMOND HEPLER, *Assistant Professor*

The aim of graduate work for students in Horticulture is to acquaint the candidate with the details of present horticultural practices and the experimental evidence bearing on them. Participation in the weekly discussion group or seminar is required. Methods of investigating horticultural problems will be studied, and work must be elected in biological and fundamental sciences which are related to the subject, as for instance, Botany, Chemistry, Genetics and Economics.

The student must have completed a course of study in Horticulture and related sciences equivalent to that required of students majoring in Horticulture at this institution. The student should also have had sufficient practical experience to enable him to understand and appreciate the problems of Horticulture.

The library and equipment of the Experiment Station are available for the use of graduate students who will be expected to become familiar with and share in the experimental work of the department.

- 5-a. Systematic Horticulture. 4 units.
10-c. Evolution and Improvement of Plants. 8 units.
12-a, 12.5-b. Seminar. 4 units each.
14-a, 15-b, 16-c. Advanced Horticulture. To be arranged.

For description and prerequisites of the preceding subjects, see the general catalog of the University.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

101. Horticultural Problems. A critical study of the results of original investigations in Pomology and Olericulture. 12 units.
102. Methods of Horticultural Research. An examination of the methods used in laboratory and field by horticultural investigators. 6 units.

GRADUATE BULLETIN

LANGUAGES

HAMILTON FORD ALLEN, *Professor*

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

French 101-a, 102-b, 103-c. The Classic Drama. Reading of several plays, and study of the technique and sources of the classic drama. Lectures, 3 units; preparation, 9 units. Total, 12 units each.

Spanish 101-a, 102-b, 103-c. Recent Tendencies in Spanish Literature. Prose and poetry of the end of the nineteenth and beginning of the twentieth centuries. Lectures, 3 units; preparation, 9 units. Total, 12 units each.

French and Spanish 104. General Phonetics. A study of the sounds and intonations of French and Spanish. Lectures, 3 units; preparation, 9 units. Total, 12 units.

French 105. History of the French Language. Historical grammar, and reading of selections. Lectures, 3 units; preparation, 9 units. Total, 12 units.

Spanish 105. History of the Spanish Language. Historical grammar, and reading of selections. Lectures, 3 units; preparation, 9 units. Total, 12 units.

MATHEMATICS

HERMON L. SLOBIN, *Professor*

GEORGE N. BAUER, *Associate Professor*

50-a, 51-b, 52-c. Introduction to Advanced Analysis. Differential equations, sequences and series with applications. Prerequisite: Mathematics 9. Recitations, 3 units; preparation, 6 units. Total, 9 units.

53-a, 54-b, 55-c. Advanced Analytic Geometry. Coördinate systems; algebraic curves; application of the theory of invariants to higher plane curves of the third and fourth order; application of calculus to analytic geometry. Prerequisite: Mathematics 5 and 9. Recitations, 3 units; preparation, 6 units. Total, 9 units.

301-a, 302-b, 303-c. Theory of Functions of a Real Variable. A critical study of Infinitesimal Analysis. Prerequisite: Mathematics 52-c. Recitations, 3 units; preparation, 6 units. Total, 9 units.

UNIVERSITY OF NEW HAMPSHIRE

PHILOSOPHY AND PSYCHOLOGY

(See also Applied Psychology under Education.)

HERBERT F. RUDD, *Professor*

ADOLF G. EKDAHL, *Assistant Professor*

- 31-a. Introduction to Reflective Thinking. 9 units.
- 32-b. The Changing World and Changing World-views. 9 units.
- 33-c. The Foundations of Philosophy. 9 units.
- 41-a. History of Philosophy. 9 units.
- 42-b. Literary Contributions to the Field of Philosophy. 9 units.
- 43-c. Ethics. 9 units.
- 51-a, 52-b, 53-c. Seminar. Special Problems in Psychology. Credit to be arranged.
- 54-a, 55-b, 56-c. Seminar. Special Topics in Philosophy. Credit to be arranged.

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

- 104-a, 105-b, 106-c. Research in Psychology. Credit to be arranged.
- 107-a, 108-b, 109-c. Advanced Problems in Philosophy. Credit to be arranged.

PHYSICS

H. L. HOWES, *Professor*

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

- 41-a. Theory of Electrons. A study of the experimental methods employed in determining the properties of the electron. The work of Sir J. J. Thompson, C. T. R. Wilson, R. W. Millikan and others will be considered. Prerequisites: Physics 11; Mathematics 9. 9 units.
- 42-b. Theory of Electrons. A continuation of 41-a to include the theory of gaseous conduction, ratio of charge to mass, ionization by collision, cathode rays, positive rays. Prerequisite: Physics 41-a. 9 units.
- 43-c. Theory of Electrons. A continuation of 42-b to include the theory of thermionic emission, the photo-electric effect, X-rays and a very brief consideration of the modern theory of radiation. Prerequisite: Physics 42-b. 9 units.

GRADUATE BULLETIN

SOCIOLOGY

A. N. FRENCH, *Professor*

E. A. BISHOP, *Assistant Professor*

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

30-a, 31-b, 32-c. **Advanced Seminar in Sociological Research.** Provision is here made for field work and for library research. It may be done in connection with allied departments. Units as authorized.

36-a, 37-b, 38-c. **Population Problems.** Investigations of problems incident to the trend of population. A study of causes for the regional population increases and decreases of urban and rural New England. 3 hours preparation per conference. Units as authorized.

39-a, -b, -c. **The City.** A study of human behavior in the urban environment inclusive of its physical organization, its occupations and cultures. 3 hours preparation per conference. Units as authorized.

40-a, 41-b, 42-c. **Advanced Sociology.** Advanced studies in social theory, social philosophy, the technic of applied sociology, and statistical methods. 3 hours preparation per conference. Units as authorized.

ZOÖLOGY

C. FLOYD JACKSON, *Professor*

The special requirements for graduate work in Zoölogy include a thorough foundation in zoölogical principles, and the equivalent of a major of 27 hours.

In addition to the above, the student must have had 9 hours in General Chemistry, and 9 additional hours in any of the following subjects: Organic Chemistry, Physiological Chemistry, Physics, Botany or Psychology.

16-a, 17-b, 18-c. **Evolution and Genetics.** Recitations, 3 units; preparation, 3 units. Total, 6 units each.

36-a, 37-b, 38-c. **Histology.** Recitations, 2 units; laboratory, 6 units; preparation, 4 units. Total, 12 units each.

39-a, 40-b, 41-c. **Embryology.** Recitations, 3 units; laboratory, 4 units; preparation, 5 units. Total, 12 units each.

For description and prerequisites for the preceding subjects, see the general catalog of the University.

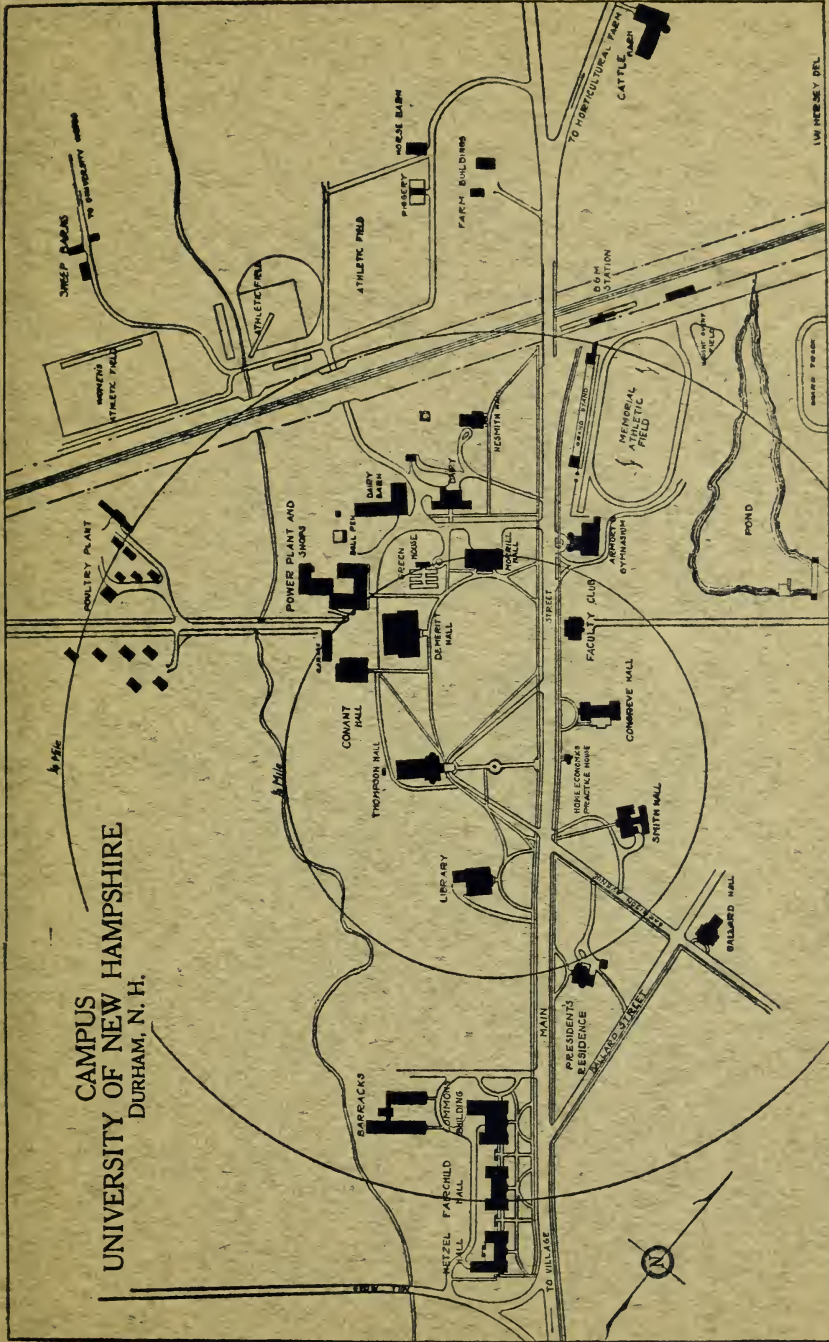
UNIVERSITY OF NEW HAMPSHIRE

SUBJECTS PRIMARILY FOR GRADUATE STUDENTS

22-a, 23-b, 24-c. **Advanced Ecology.** A study of advanced ecological problems and their correlation with Morphology, Physiology and Taxonomy as exemplified by local associations and cenoses. Lectures, 3 units; preparation and laboratory work arranged.

25-a, 26-b, 27-c. **Advanced Seminar.** To be arranged.

CAMPUS UNIVERSITY OF NEW HAMPSHIRE DURHAM, N. H.



L.W. HERSEY DEL.

This map shows the buildings of the University and the immediately adjacent grounds. It does not include the farms, forests, gardens or orchards.

