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Catalog of the Long and Middle Courses 1930 - 1931
College of Agriculture, The University of Wisconsin

Serial No. 1672—Bulletin of the University of Wisconsin—General Series No. 1446

THE UNIVERSITY OF WISCONSIN

**LONG AND MIDDLE COURSES
IN AGRICULTURE**

COLLEGE OF AGRICULTURE

1930-31



BULLETIN OF THE UNIVERSITY OF WISCONSIN
Serial No. 1672; General Series No. 1446

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Madison, Wisconsin
May, 1930

CALENDAR

ACADEMIC YEAR 1930-31

FIRST SEMESTER

Sept. 15, 16	Monday, Tuesday	Examinations for admission
Sept. 17-23	Wednesday-Tuesday	Freshman Period (attendance required)
Sept. 19-23	Friday-Tuesday noon	Registration days for other new students
Sept. 20-23	Saturday-Tuesday noon	Registration days for old students
Sept. 24	Wednesday	Instruction begins
Sept. 27	Saturday	Special examinations for removal of conditions
Nov. 27	Thursday	Thanksgiving Day; legal holiday (one day only)
Dec. 19	Friday noon	Christmas recess commences
Jan. 6	Tuesday 8 a. m.	Instruction resumed
Jan. 17	Saturday	Examinations for removal of conditions
Jan. 26-Feb. 4	Monday-Wednesday	Final examinations

SECOND SEMESTER

Feb. 2, 3	Monday, Tuesday	Examinations for admission
Feb. 5	Thursday	Registration day for new and re-entered students
Feb. 9	Monday	Instruction begins
Feb. (22) 23	(Sunday) Monday	Washington's Birthday; legal holiday
April 7	Tuesday, after last class	Spring recess commences
April 15	Wednesday 8 a. m.	Instruction resumed
April 18	Saturday	Examinations for removal of conditions
May 30	Saturday	Memorial Day; legal holiday
June 8-16	Monday-Tuesday	Final examinations
June 15, 16	Monday, Tuesday	Examinations for admission
June 20	Saturday	Alumni day
June 21	Sunday	Baccalaureate day
June 22	Monday	Commencement day

SUMMER SESSION 1931

June 29	Monday	Registration day, University at large
June 30	Tuesday	Instruction begins, University at large
July 4	Saturday	Independence Day; legal holiday
August 7	Friday	Six-week session closes
August 28	Friday	Nine-week session closes

ACADEMIC YEAR 1931-32

Sept. 23	Wednesday	Instruction begins
Jan. 25-Feb. 3	Monday-Wednesday	Final examinations
Feb. 8	Monday	Instruction begins
June 7-15	Monday-Tuesday	Final examinations
June 21	Monday	Commencement day

THE REGENTS OF THE UNIVERSITY

State-at-Large—CARL DREXLER, Menasha	1936
State-at-Large—ADOLPH GUNDERSEN, La Crosse	1931
State-at-Large—JOHN C. SCHMIDTMANN, Manitowoc	1932
State-at-Large—ARTHUR SHOLTS, Oregon	1935
First District—VICTOR P. RICHARDSON, Janesville.....	1931
Second District—FRED CLAUSEN, Horicon.....	1936
Third District—HARRY L. BUTLER, Madison.....	1931
Fourth District—MRS. META BERGER, Milwaukee.....	1934
Fifth District—JUDGE A. C. BACKUS, Milwaukee.....	1933
Sixth District—MISS ELIZABETH A. WATERS, Fond du Lac.....	1933
Seventh District—MRS. CLARA T. RUNGE, Baraboo.....	1932
Eighth District—GEORGE W. MEAD, Wisconsin Rapids.....	1934
Ninth District—HERMAN ULLSPERGER, Sturgeon Bay.....	1936
Tenth District—BEN F. FAAST, Eau Claire.....	1932
Eleventh District—PETER EIMON, Superior.....	1935
GLENN FRANK, President of the University, <i>ex-officio</i> .	
JOHN CALLAHAN, State Superintendent of Public Instruction, <i>ex-officio</i> .	

OFFICERS OF THE REGENTS

BEN F. FAAST, President
 MISS ELIZABETH A. WATERS, Vice President
 SOLOMON LEVITAN, State Treasurer, *ex-officio* Treasurer
 JAMES D. PHILLIPS, Business Manager
 MAURICE E. MCCAFFREY, Secretary

THE BOARD OF VISITORS

Appointed by the Regents

MRS. CHARLES R. CARPENTER, Madison.....	1930
GEORGE P. HAMBRECHT, Madison.....	1931
LOYAL DURAND, Milwaukee.....	1932
H. W. KIRCHER, Sheboygan.....	1933

Appointed by the Alumni

WILLIAM J. MEUER, Madison.....	1930
CHARLES L. BYRON, Chicago.....	1931
B. E. MCCORMICK, Madison.....	1932
MRS. LUCY M. JOHNSON, Madison.....	1933

Appointed by the Governor

DR. W. C. SULLIVAN, Kaukauna.....	1930
MRS. HATTIE TEGTMEYER, Milwaukee.....	1931
MRS. ALLAN CLASSON, Oconto.....	1932
CARL J. HESGARD, Orfordville.....	1933

THE FUTURE

The future of a great nation depends on a progressive agriculture and the majority of the rural leaders of the future must be men and women trained in the problems of the nation and community, home and the farm. Agriculture is the most important business in the world today because its products are the necessities for the future of other industries.

Men are needed who have the capacity to comprehend the situation, the ability to interpret social and economic factors, and the power to direct the energies of the people in making the necessary civic, political, and business adjustments of the future. Responsible positions are unfilled today for lack of competent men to fill them. It is a wonderful opportunity for ambitious young men. The country needs leaders. Will you prepare yourself to meet the call? The University of Wisconsin through its College of Agriculture is equipped to train you for a future in leadership for agriculture.

HERE ARE MANY OPPORTUNITIES

Many aspects of business, transportation, manufacturing, marketing, banking, publishing, teaching and the like are closely related to the operations of the farm. The man who engages in these fields finds himself constantly placed in contact with the agricultural problems, usually of an economic character. The Agricultural College fits men for a variety of types of work and a study of our graduates finds them filling more than a hundred types of positions for which their agricultural college course was a fundamental training. Training for production on the farm is but one of the opportunities of the graduate of the agricultural courses.

A study of positions held by the graduates of 42 years of this college shows 78 per cent in agricultural work with 10 per cent more indirectly connected with agriculture. Of the graduates 25 per cent were farming, 15 per cent in non-agricultural positions, 17 per cent were in commercial positions and the remaining 43 per cent were in educational work as graduate students, teachers, county agents, extension specialists, regulatory work, bankers' agents, etc. A few important types of work are suggested.

THE FARM. The opportunity and the financial income on the farm is equal to returns in other lines of agricultural effort. Many graduates are going from the agricultural college direct to the farm.

FARM SUPERINTENDENTS AND FARM MANAGERS are in demand; these positions afford opportunity to accumulate capital in preparation for future ownership.

COMMERCIAL PHASES OF AGRICULTURE. Manufacturers of farm implements, tractors, gas engines, fertilizers, dairy products, and so forth, want men with agricultural college training for office, field, extension and sales.

AGRICULTURAL EXTENSION AND COUNTY AGENTS. The state colleges and the United States Department of Agriculture need specialists in all lines of agricultural extension. The demand for county agricultural agents is far in excess of the supply of trained men.

BANKS, DEVELOPMENT COMPANIES, RAILROADS. The business man realizes the dependence of business on the success of the farmers, and trained agricultural men are demanded for development work.

VOCATIONAL AGRICULTURAL TEACHERS. Federal aid for vocational agriculture in schools, especially high schools, has created a new demand for teachers in each state and this aid has provided attractive salaries for teachers.

COLLEGE POSITIONS. Students who have made good records and with practical experience are called into college positions as teachers, research and extension workers. Opportunities are many for such persons to do graduate work on part-time pay, fellowships or scholarships.

AGRICULTURAL PRESS. The field of agricultural journalism and advertising is a promising one which calls for increasing numbers of men and women with agricultural training.

RESEARCH BY COMMERCIAL INTERESTS. The agricultural graduate ready to do investigational work is in great demand in the business world as well as by state agricultural experiment stations and the United States Department of Agriculture.

FOREIGN SERVICE. We have calls from foreign countries for men as farm managers, teachers, and extension specialists and in commercial agricultural lines.

MISCELLANEOUS POSITIONS. Positions as college teachers, county Y. M. C. A. worker, drainage engineer, bacteriologist, soil surveyor, and manager of city milk supply, creamery, shipping associations, or other associations demand the agricultural college graduate. Prospective veterinarians may get fundamental courses and later transfer to a veterinary college. This field has great possibilities at the present time.

THE LONG COURSE (Four Years)

THE LONG COURSE IN AGRICULTURE is the one which most students take and is the course leading to the degree of Bachelor of Science (Agriculture). Four years of University work is required although the course may be taken in less than four years if summer sessions are attended. The more desirable commercial, managerial, and professional positions require this course as the minimum preparation.

PLAN OF COURSE

The Long Course serves a two-fold purpose; it gives a broad general training and furnishes specific technical knowledge of agriculture. It is hoped through this course to fit students to be useful to the highest degree in any line of agricultural effort and at the same time to be active in the uplift of their communities.

Curricula A and B (see pages 8 and 9) are provided which have a common freshman year of required work. Curriculum B has some freedom in the choice of science. The difference in the curricula is primarily in the sophomore year. In the junior and senior years there are few required

subjects, and the student may choose subjects of his major and related work. The major may be chosen as early as the beginning of the sophomore year and the student may at that time choose an adviser in the department in which he intends to major.

GRADUATION REQUIREMENTS. A total of 133 credits and 133 grade points in addition four semesters of military drill or physical education taken during the freshman and sophomore years is required for graduation.

Two optional subjects as listed on page 10 are required. They must be chosen in two departments.

Students may select a major at the beginning of the sophomore year and they must select it not later than the second semester of the junior year. The major cannot be changed after registration for the first semester of the senior year.

A minimum of fifteen elective credits in a chosen department shall constitute a major, except that courses in other departments and colleges may, on approval of the Agricultural faculty, and when printed in the circular be counted towards a major.

A thesis is required as a portion of the major in certain cases and must consist of four credits. See page 7.

No student shall take more than 25 elective credits including Thesis in any one department.

A minimum of 10 elective credits must be taken outside the College of Agriculture. Six of these credits shall be in English, Philosophy, Psychology, Sociology, Political Science or History.

Students except during the first semester of the freshman year when a minimum of 14 credits may be taken, must take at least 16 and not more than 18 credits each semester, exclusive of drill, convocation and physical education, unless they secure special permission from the Executive Committee of Class Advisers to vary from the rule. This applies to seniors regardless of the number of credits remaining to complete the requirements for graduation.

A student who has received a standing of at least B in each subject of a regular schedule for the preceding semester may carry a maximum of 20 credits without Executive Committee action.

No student who does not earn at least one grade-point per credit during the last two semesters of his attendance at the University will be recommended for a degree.

Each student shall have farm experience satisfactory to the department in which he majors.

POINTS. A system of points is in operation for all students in the University of Wisconsin. Graduation from the Long Course in Agriculture requires 133 grade points, and they are awarded on the following basis:

For grade A, excellent, three points for each hour of credit.

For grade B, good, two points for each hour of credit.

For grade C, fair, one point for each hour of credit.

For grade D, poor, credit but no points.

It is evident that an average grade of Fair (C) is required for graduation. If a student by reason of grades of Poor falls behind in the required number of points, he is ineligible for graduation. By the use of the point system the student may readily determine the quality of progress he is making in the course.

PHYSICAL EDUCATION—MILITARY TRAINING. Every male freshman and sophomore is required to take three hours' work a week in either physical

education or military science for a total of four semesters. The student shall express his choice between these alternatives when filling out his semester election card. Freshmen and sophomores who take Military Drill are furnished a uniform by the University. A deposit of \$10.00 must be made which may be returned when equipment is returned, subject to regulations of the military department.

FARM EXPERIENCE. Before graduation from the four year or two year courses, a student must have had farm experience satisfactory to the department in which he majors. Students who have had little or no farm experience before entering college will find it to their advantage to drop out one year during their course in order to secure 12 months consecutive farm experience on some good farm. A good time to do this is at the close of the first semester. At this time the student can get in touch with the winter and spring farm work and become accustomed to the work before the severe spring and summer work begins.



DAIRY MANUFACTURING AT WISCONSIN

The dairy department of Wisconsin is one of the most important as Wisconsin leads in dairying.

FRESHMAN CONVOCATIONS are held regularly to give students an opportunity to hear talks of special interest to freshmen. Attendance upon these convocations is required of all freshmen.

THESIS REQUIREMENT. Students in the four year course in agriculture whose grade points at the beginning of the senior year are 50 per cent more than the number of credits obtained in the various courses which have been taken shall be required to write a thesis. Students whose grade points are less than 50 per cent more than the number of credits obtained may write a thesis only upon the recommendation of the adviser and the permission of the agricultural faculty. The thesis shall be four credits.

THE COLLEGE OF AGRICULTURE

CURRICULUM A

FRESHMAN YEAR

Credits	Credits
English 1a..... 3	English 1b..... 3
Chemistry 1a..... 5	Chemistry 1b..... 5
Animal Husbandry 1 or Agronomy 1.....(A) 3	Agronomy 1 or Animal Husbandry 1...(A) 3
Mathematics 71.....(C) 4	Botany 1..... 9
<hr/>	<hr/>
Total..... 15	Total..... 16
Military Drill or Physical Education Convocation	Military Drill or Physical Education

SOPHOMORE YEAR (D)

Credits	Credits
Chemistry 12 (Quant.)..... 3	Agricultural Chemistry 1 and 2..... 5
Zoology 3..... 3	Economics 1a..... 4
Soils 1..... 5	Agricultural Option.....(B) 3
Agricultural Option.....(B) 3	Physics 61..... 5
Electives..... 2	
<hr/>	<hr/>
Total..... 16	Total..... 17
Military Drill or Physical Education	Military Drill or Physical Education

JUNIOR YEAR

Agricultural Bacteriology 1..... 5	Botany 146 or Physiology 3 or substitute.....(F) 4
Agricultural Economics 1..... 3	Electives.....12-14
Electives (E) (I)..... 10	<hr/>
Total..... 18	Total.....16-18

SENIOR YEAR (K)

Major (I)..... 5	Major (I)..... 5
Electives.....11-13	Electives.....11-13
<hr/>	<hr/>
Total.....16-18	Total.....16-18

A. Students will elect one of these subjects the first semester and the other the second semester.

B. See agricultural optionals, page 10 of this circular.

C. On approval of the Executive Committee of Class Advisers, a student may take in place of Mathematics 71, some other course in Mathematics.

D. Students may choose their major department at the beginning of the sophomore year. Changes in major may be made by meeting departmental requirements.

E. Ten elective credits in the junior or senior year shall be taken in the College of Letters and Science of which 6 credits shall be in English, Philosophy, Psychology, Sociology, Political Science, or History.

CURRICULUM B

FRESHMAN YEAR

	Credits		Credits
English 1a.....	3	English 1b.....	3
Chemistry 1a.....	5	Chemistry 1b.....	5
Animal Husbandry 1 or Agronomy 1.....(A)	3	Agronomy 1 or Animal Husbandry 1...(A)	3
Mathematics 71.....(C)	4	Botany 1.....	5
Total.....	15	Total.....	16
Military Drill or Physical Education Convocation		Military Drill or Physical Education	

SOPHOMORE YEAR (D)

	Credits
An Agricultural option each semester.....	(B) 6
Economics 1a, first or second semester.....	4
Soils 1 (1st Sem.) or Ag. Chemistry 1 and 2 (2nd Sem.).....	(G) 5
Elective (E).....	7-11
Science or Mathematics (Outside College of Agriculture).....	(H) 10
Military Drill or Physical Education	32-36

JUNIOR YEAR

	Credits		Credits
Ag. Bacteriology 1.....	5	Botany 146 or Physiology 3 or subst. (F)	4
Ag. Economics 1.....	3	Major and Electives.....	12-14
Major and Electives (E-J).....	8-10	Total.....	16-18
Total.....	16-18	Total.....	16-18

SENIOR YEAR (J)

Major and Electives (I).....	16-18	Major and Electives (E-I).....	16-18
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F. Students majoring in the following departments may substitute as follows for Plant Physiology or Animal Physiology.

- Agricultural Economics—Economics 1b.
- Agricultural Journalism—Agricultural Economics 25.
- Agricultural Engineering—Advanced Mathematics.
- Agricultural Education—Three credits in Department of Education.
- Dairy Husbandry—Economics 1b.

G. Quantitative Chemistry must be taken the first semester if Agricultural Chemistry 1 and 2 are elected in the second semester.

H. To be taken outside College of Agriculture in Chemistry, Physiology, Zoology, Physics, Geology, Geography or in Advanced Mathematics or Advanced Botany beyond course taken in the freshman year.

I. A major shall consist of not less than 15 elective credits nor more than 25 elective credits. Courses outside the department may be counted as a portion of the departmental major when reported in advance to the faculty of the College of Agriculture.

J. A student must complete a minimum of 50 credits in the agricultural departments (required agricultural courses, major, options, and electives).

K. Forty credits of elective work may be taken outside the College of Agriculture.

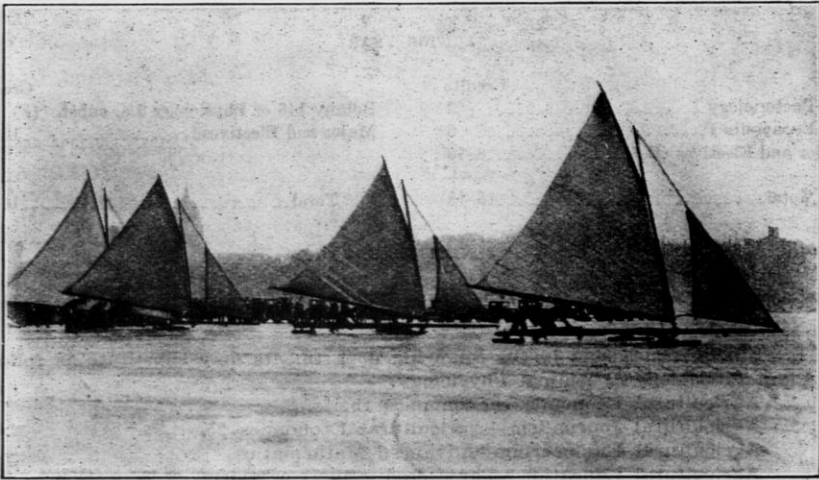
AGRICULTURAL OPTIONALS. The student must choose two of the following options, but from different departments. Any of the subjects not taken as an optional may be taken as an elective.

	Credits
Agricultural Engineering 1—Land Surveying and Drainage--	3
Horticulture 1—Principles of Fruit Growing-----	3
Poultry 1—Poultry Raising -----	3
Veterinary Science 1—The Animal Body-----	3
Dairy 1—General Farm Dairying-----	3
Horticulture 3—Vegetable Gardening-----	3
Economic Entomology 1—Farm Insects-----	3
Agricultural Engineering 5—Farm Machinery-----	3

THE MIDDLE COURSE (Two Years)

This course is designed to meet the needs of students who have had a high school training but who cannot spend more than two years at the university. Requirements for admission are the same as for the Long Course.

Students taking the Middle Course and desiring to transfer to the Long Course must be prepared to spend more than the usual four years in order to complete the requirements. (See outline of Long Course, pages 8 and 9.)



ICE BOATING ON LAKE MENDOTA

Winter sports such as ice boating, tobogganing, skiing and skating are popular with university students.

GRADUATION REQUIREMENTS

A total of 64 credits and 64 grade points in addition to freshman convocation and four semesters of military drill or physical education taken during the freshman and sophomore years is required for graduation. For required subjects see page 11.

Students in the Middle Course except during the first semester of the freshman year must take at least 16 and not more than 18 credits each

semester, exclusive of convocation, drill or physical education, unless they secure special permission from the Executive Committee of Class Advisers to vary from the rule.

A student who has received a standing of at least 85 in each subject of a regular schedule for the preceding semester may carry a maximum of 20 credits without Executive Committee action.

A Middle Course student may receive credit for not more than 10 elective credits outside the College of Agriculture. Subjects of the College of Letters and Science required in the Long Course but not in the Middle Course such as Botany 1, Physics 61, etc., are considered electives outside the College of Agriculture.

For farm experience see page 7 of this circular.

FRESHMAN YEAR

Credits		Credits	
English 1a—Freshman composition.....	3	English 1b—Freshman composition.....	3
Chemistry 1a—General chemistry.....	5	Chemistry 1b—General chemistry.....	5
Electives.....	6	Electives.....	8
Convocation.....	0	Physical activity requirement.....	0
Physical activity requirement.....	0		
	-----		-----
	14		16

SOPHOMORE YEAR

Electives.....	17	Electives.....	17
Physical activity requirement.....	0	Physical activity requirement.....	0
	-----		-----
	17		17

ADMISSION TO THE LONG OR MIDDLE COURSES

The admission requirements for the long and middle courses in agriculture are the same as for the College of Letters and Science.

ENTRANCE REQUIREMENTS

Entrance requirements are stated in terms of units. A unit equals five recitations a week for one year of at least 36 weeks in one branch of study. Two laboratory periods in any science or vocational study are considered equivalent to one class exercise. Three recitations a week for a year and a half may be counted as one unit.

Not more than four units will be accepted in any one subject. Foreign language is not required for entrance but entrants offering one foreign language must have at least two units. They must have two units in one foreign language before one unit in another college may be credited. In exceptional cases one unit in a single foreign language may be offered as an "optional subject."

I. The following units are required of all:

English 3 or 2 units

(Three units of English will be required of all students who do not offer two units of one foreign language.)

Mathematics

Algebra 1 unit

Geometry 1 unit

II. Two units must be presented from one of the following:

One foreign language -----	2 units
(French, German, Greek, Hebrew, Latin, Norse or Spanish.)	
or Science -----	2 units
or History -----	2 units

III. In addition to the units required under I, and II, a sufficient number of units to make a total of fifteen must be offered from groups A and B, except that not more than 4 units may be offered from group B.

GROUP A

English -----	1-2	Mathematics	
Foreign Language		Adv. Algebra -----	½
French -----	1-4	Solid Geometry -----	½
German -----	1-4	Trigonometry -----	½
Greek -----	1-3	Science	
Hebrew -----	1-2	Botany -----	½-1
Latin -----	1-4	Biology -----	1
Norse -----	1-2	Chemistry -----	1
Spanish -----	1-4	General Science -----	½-1
History and Civics		Geography -----	½-1
History -----	1-4	Physics -----	1
Civics -----	½-1	Physiology -----	½
Economics -----	½	Zoology -----	½-1

GROUP B

Agriculture -----	1-4	Domestic Art -----	1-2
Bookkeeping -----	1	Mechanical Drawing -----	1-4
Commercial Law -----	½	Drawing, Art and Design -----	1-4
Commercial Arithmetic -----	½	Shop Work -----	1-2
Commercial Geography -----	½	Shop Work and Drawing -----	1-4
Shorthand -----	1-1½	Music -----	1-4
Typewriting -----	½	Optional -----	½-1
Domestic Science -----	1-2		

* A "unit" is not to be confused with a "credit" the University measurement of work.

METHODS FOR ADMISSION

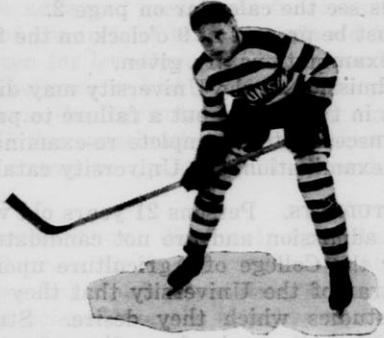
There are four methods for admission to the College of Agriculture for the Long or Middle Course as follows:

ADMISSION UPON CERTIFICATE. Graduates of accredited high schools may enter the University without examination on the presentation of a certificate showing the satisfactory completion of fifteen required units and containing the recommendation of principal. Forms of such certificates, prepared by the University, must be used, and may be obtained from the Registrar. These certificates should be sent to the University before August 1.

Graduates of four-year non-accredited schools in Wisconsin will be admitted without examination but on probation, upon the favorable recommendation of the principal, providing the graduate has fully and satisfactorily covered in his high school course the full requirements for admission to the University.



Russell Rebholz



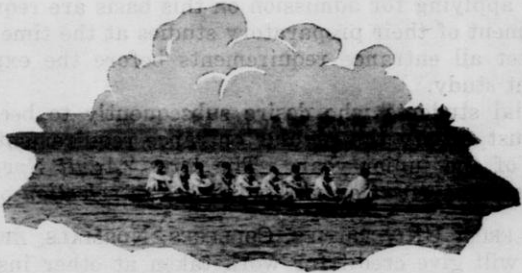
Harold Rebholz



Milo Lubratovich



Eldon M. Marple



Varsity Crew



Milo Lubratovich



Delmar Fink



Vernon Goldsworthy



Harold Rebholz



Myron Hales



McClure Thompson

A FEW AGRICULTURAL STUDENTS ARE ACTIVE IN ATHLETICS

EXAMINATION. There are two regular entrance examinations of the University. For dates see the calendar on page 2.

All candidates must be present at 9 o'clock on the first day of the examination. No special examinations are given.

Candidates for admission to the University may divide the subjects and take the examinations in two trials; but a failure to pass all of the subjects in the two trials will necessitate a complete re-examination. For the character of the entrance examination, see University catalog.

ADULT SPECIAL STUDENTS. Persons 21 years old who do not possess all the requirements for admission and are not candidates for a degree, may be permitted to enter the College of Agriculture upon giving satisfactory evidence to the registrar of the University that they are prepared to take advantageously the studies which they desire. Students are generally allowed to select their studies only from the courses open to freshmen. Exceptions are permitted by the Executive Committee of the College of Agriculture upon satisfactory grounds, but the student must show special preparation and special necessity for the exception.

Candidates applying for admission on this basis are required to present a detailed statement of their preparatory studies at the time of their admission and to meet all entrance requirements before the expiration of two years of resident study.

Adult special students who desire subsequently to become candidates for a degree must satisfy the regular entrance requirements before beginning the work of the junior year. The term "*Adult Special*" applies to entrance and does not grant special privileges in selection of subjects.

ADMISSION FROM UNIVERSITIES, COLLEGES, NORMALS, ETC. The College of Agriculture will give credit for work taken at other institutions where such work corresponds with the requirements of the agricultural courses. Evidence must be presented showing sufficient entrance units before advanced credits will be considered.

Transcripts should be sent to Assistant Dean J. A. James before September first if possible. A satisfactory scholastic record and honorable dismissal are required.

SCHOOLS OUTSIDE WISCONSIN. Graduates of secondary schools outside Wisconsin will be admitted when recommended and certified by the principal, provided the minimum entrance requirements are met. Work submitted to be satisfactory for entrance shall be interpreted to mean an average standing of "good." This applies to schools of the North Central Association or of a school maintained on the basis of regular inspection accredited relationship with the state university or other university included in the membership of the Association of American Universities.

Credentials properly certified by the principal on forms provided by the University should be submitted for approval by the University before August 1.

ADVANCED CREDIT for high school work may be granted to students with satisfactory average standings presenting more than 15 units accepted for admission, provided: (1) the subjects in which advanced credit is sought are the general subjects accepted for admission to the University; (2) the work is as advanced as work given in the freshman year; (3) the student's course of study in which credit is desired be approved by the chairman of the department and (4) the students pass a satisfactory examination at

least two hours in length, held at the University before or during the Christmas recess. No advanced credit will be given for work in language unless it be in excess of six units of language offered for admission, nor will advanced credit be given for less than three semester hours.

Any student who believes he had in the secondary school the equivalent of any required course in the Agricultural College, may apply for examination in the course. If the examination be satisfactory to the department, exemption from the course is granted without reducing the number of credits for graduation.

STUDIES BY CORRESPONDENCE. No purely agricultural courses are given by correspondence. Courses which are required of students in the College of Agriculture, such as English, Mathematics, Botany, and electives in the College of Letters and Science, may be taken by correspondence and where such work is satisfactorily performed may be applied on the courses. For further information address University Extension Department.



THE WISCONSIN LITTLE INTERNATIONAL

During the Farmer's Week the students hold a livestock show and have a fine entertainment for our visitors.

FEES AND EXPENSES

The largest expense of the student is for board and room. Rooms can be obtained in student rooming houses and private residences in the city at prices ranging from \$2 to \$5 a week for each student. The average price is \$3 a week. Board in clubs, private families, and cafeterias ranges from \$5 to \$8 a week. Many students partly support themselves by assisting at boarding houses or by doing other kinds of work that do not conflict with their studies.

The cost of text books, stationery, locker fees, athletic suits, and so forth is from \$25 to \$40 a year.

An incidental fee of \$20.50 a semester is charged each student. This includes a fee for medical attention, as explained on page 19. Non-residents of Wisconsin pay a tuition fee of \$100 a semester in addition to this incidental fee. An additional fee of \$3 is charged students who pay their fees after the regular registration days (see calendar). The Bursar shall refuse to accept fees from any student who does not pay promptly after his registration card is issued. The University reserves the right to alter these charges without further notice.

Laboratory fees for required courses taken in the College of Letters and Science are as follows. In all courses there is a possible refund at the end of the semester, depending on the amount of breakage in the laboratory.

Chemistry 1 (each semester) ---	\$17.50	Botany 146 -----	\$ 5.00
Physics 61 -----	7.00	Physiology 3 -----	3.00
Botany 1 -----	5.00	Chemistry 12 -----	20.00
Zoology 3 -----	5.00		

When elective courses are taken laboratory fees vary according to courses taken.

Graduate students pay the same fees as undergraduate students. Fellows, scholars, and student assistants are required to pay the regular laboratory fees, but instructors and assistants are exempt, in their own department.

Freshman or sophomore students who take military drill are furnished a uniform by the University. A deposit of \$10 must be made subject to regulations of the Military Department.

A study of the above shows that a freshman has laboratory fees of approximately \$35, and incidental fee of \$20.50 for each semester and also military uniform deposit of \$10 for the first semester.

FINANCIAL HELP FOR STUDENTS

The University has made provision for a limited amount of financial help for needy students. While every possible assistance is rendered self-supporting students of the College of Agriculture they are advised not to enter the University without some available funds. Students of the College of Agriculture are urged to make use of the following suggestions and apply to proper persons.

OPPORTUNITY FOR WORK WHILE TAKING THE COLLEGE COURSE. Many students help to pay the expense of their college course by waiting on tables, tending furnaces, restaurant work, dish washing, work in private homes, clerical, canvassing, etc. The University operates an employment bureau which endeavors to secure satisfactory employment for worthy students. Students desiring work should write the Student Employment Office, Administration Building, University of Wisconsin, Madison, and receive application blanks and detailed information about student employment in Madison. They should arrive in Madison a few days ahead of registration to get work that may be available. As places of employment are eagerly sought for and cannot always be obtained at once, those dependent upon themselves for support should not come to the University unless they have reserve funds for use until employment is obtained.

STUDENT LOAN FUND. There is a fund of nearly \$2,000 which is available to all students in the College of Agriculture. This fund is to be loaned to needy students, in small amounts without interest, for short time loans. The money is to be returned from the first available earnings of the student. If the note is not paid at maturity, 6 per cent interest will be charged from the date of maturity until payment is made. Apply to Assistant Dean J. A. James.

FRESHMAN SCHOLARSHIPS. Five scholarships of \$100.00 each will be awarded to freshmen in the Agricultural courses who are residents of Wisconsin. An essay on an assigned topic must be presented to Assistant Dean J. A. James, together with certain references, before August 15, 1930. For further information write Assistant Dean J. A. James, College of Agriculture, Madison, Wisconsin.

WISCONSIN LEGISLATIVE SCHOLARSHIPS. The Regents of the University remit the tuition to a number of needy and worthy non-resident students upon the basis of scholastic attainment. Apply to Assistant Dean J. A. James during the second semester and before March 1.

WISCONSIN SCHOLARSHIPS. Students who are residents of Wisconsin and who are attending the University for their first year of residence and are in need of financial assistance should apply to Assistant Dean J. A. James, who represents the agricultural college on the University committee which awards 50 Wisconsin scholarships of \$100 each. Applications should be made near the close of the first semester and before the opening of the second semester.

FELLOWSHIPS AND SCHOLARSHIPS. Ten fellowships and two scholarships, are offered graduate students in this college. These are granted to those candidates best fitted for the work selected. The fellowships return \$600 a year and the scholarships \$250 a year. Application for these honors must be made to the Registrar of the University on proper forms on or before Feb. 15.



THE BOYS' DORMITORIES NEAR AGRICULTURAL HALL

AGRICULTURAL STUDENT ORGANIZATIONS

Several societies, maintained by the agricultural students, meet at intervals to discuss questions related to their special interests. The following list will give an idea of the nature of the various clubs and societies.

ALPHA ZETA. A chapter of the national honorary agricultural fraternity is maintained by faculty and student members.

THE COUNTRY MAGAZINE is a student magazine published monthly by students in the college.

THE SADDLE AND SIRLOIN CLUB is an organization of students interested in animal husbandry. The "Wisconsin International" is a phase of this work and their support is given to the Stock Judging Teams which represent the agricultural college at the International Livestock Show and the National Dairy Show.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS (Student Branch). This organization meets every two weeks and students report on agricultural engineering topics. Special lectures appear three or four times each semester. Students take charge of an "exhibition night" once each year.

BLUE SHIELD consists of a group of students interested in rural organization work. Its programs prepare the men in spirit, mind, and body to become rural workers and leaders particularly in community work.

HONORS IN THE COLLEGE OF AGRICULTURE

Honors and high honors are awarded at the end of the sophomore year and at graduation upon the number of grade points earned.

SOPHOMORE HONORS AND SOPHOMORE HIGH HONORS are awarded on the basis of a minimum of two full years of work acquired in residence. The student averages two and one-quarter grade points per credit to secure honors, and two and three-quarters grade points per credit to secure high honors. Adjustments are made when students carry more than the regular schedule.

In 1929 the following Long Course students were awarded Sophomore Honors:

SOPHOMORE HONORS

High Honors

Ahlgren, Henry L.

Honors

Bandoli, Harold
Carter, Donald

Erickson, Robert
Renk, Wilbur N.

Richards, Claire I.

SENIOR HONORS AND SENIOR HIGH HONORS are awarded at the completion of at least two full years of work, acquired in residence, after the completion of sophomore work. The student must average two and one-quarter grade points per credit to secure honors.

The following were granted at Commencement in June, 1929.

SENIOR HONORS

High Honors

Wilcox, Donald E.

Honors

Clark, Harold G.
Delwiche, Edmond

Ehler, Elisabeth
Hendrickson, Adolph

Proctor, Robert P.

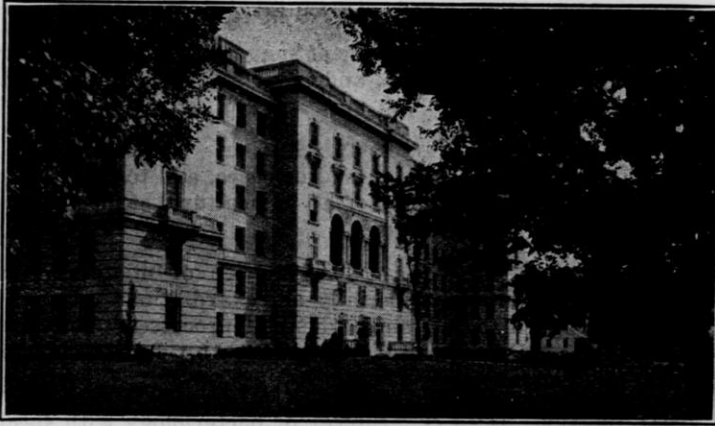
STUDENT HEALTH

The Department of Clinical Medicine has general supervision of the health of the students. It aims to determine the medical fitness of each student, to study the intricate problems of the relation of health to higher education, and to prevent disease among the students.

MEDICAL EXAMINATIONS. Students entering the University for the first time undergo a careful medical examination to determine their fitness for university work. An appointment for medical examination is made at the time of registration. Records of the results of these examinations are kept in the office of the Department of Clinical Medicine for future reference in the supervision of the mental and physical development of the student. The Medical Adviser's Office is established for the general supervision of students needing medical attention. All cases of student illness should be promptly reported to the office whether or not professional service is desired.

Conditions affecting the general welfare of the University community are treated by the members of the staff, but students requiring special care—major surgery, treatment of the eyes, ear, x-rays, and so forth, are referred to specialists.

A modern and completely equipped infirmary is maintained by the University for the care of students requiring medical and surgical treatment and for the isolation of those suffering from communicable diseases. Cases requiring special methods of study and treatment are cared for by the University medical staff in the Wisconsin General Hospital erected in gratitude by the people of the state.



GUARDIAN OF STUDENT HEALTH

To provide the best medical and hospital care the university has this institution—the Wisconsin Memorial Hospital—where the students go for medical attention.

DEPARTMENTS OF INSTRUCTION

Abbreviations in the announcement of courses:

Yr.—course continues throughout the year

I—given during the first semester

II—given during the second semester

I and II—repeated each semester. If used with Yr., means course may be begun first or second semester

cr.—credits, i. e., hours of credits. Unless otherwise stated, the number of credits per semester is given.

AGRICULTURAL BACTERIOLOGY

EDWIN GEORGE HASTINGS, M.S., *Professor of Agricultural Bacteriology, Chairman*

EDWIN BROWN FRED, Ph.D., *Professor of Agricultural Bacteriology*

WILLIAM DODGE FROST, Ph.D., D.P.H., *Professor of Agricultural Bacteriology*

IRA LAWRENCE BALDWIN, Ph.D., *Associate Professor of Agricultural Bacteriology*

OSCAR NELSON ALLEN, M.A., *Instructor in Agricultural Bacteriology*

HARRY E. SAGEN, M.S., *Instructor in Agricultural Bacteriology*

Students majoring in this department may take Medical Bacteriology 102 or 104 or Veterinary Science 126, and count five of these credits toward the major requirement.

1. GENERAL SURVEY OF BACTERIOLOGY. I; 5 cr. The relation of micro-organisms to soil fertility, to animal diseases, and to food. Prerequisite: Chemistry 1a. Required of all agricultural students. Lab. fee \$6.75. Mr. Baldwin, Mr. Sagen.
2. GENERAL SURVEY. II; 4 cr. The relation of micro-organisms to chemical transformations, especially as regards their relation to water, food, sewage disposal, and industrial processes. For chemistry course students. Prerequisite: Chemistry 1b. Lab. fee \$6.75. Mr. Baldwin, Mr. Sagen.
4. GENERAL SURVEY. II; 5 cr. Survey of bacteriology with special emphasis on the relation of micro-organisms to foods and domestic sanitation. One out-of-town class trip taken. Prerequisite: Chemistry 1a. Required of students in home economics. Lab. fee \$6.75. Mr. Frost.
100. THESIS. Yr; 2 cr. A definite problem in dairy, soil, or household bacteriology or in animal diseases. Prerequisites: Agr. Bact. 1, 2, or 4, and consent of instructor. Lab. fee \$2.25 per lab. cr. Staff.
121. DAIRY BACTERIOLOGY. II; 3 cr. The bacteriology of milk production and distribution and of dairy manufacturing. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee \$4.50. Mr. Hastings.
123. SOIL BACTERIOLOGY. II; 3 cr. The relation of micro-organisms to soil fertility. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee \$4.50. Mr. Fred.

124. **ADVANCED TECHNIQUE. II; 3 cr.** Training in special methods of laboratory technique. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Not offered 1930-31. Lab. fee \$4.50. Staff.
125. **FOOD BACTERIOLOGY. I; 3 cr.** The role of bacteria as related to the preservation, preparation, and sanitation of foods. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee \$4.50. Mr. Frost.
126. **PHYSIOLOGY OF BACTERIA. I; 3 cr.** The chemistry and physics of bacterial processes. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee \$4.50. Mr. Baldwin, Mr. Allen.
130. **DETERMINATIVE BACTERIOLOGY. Yr; 2-5 cr.** Training in the common methods of the bacteriological laboratory. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee \$2.25 per lab. cr. Mr. Frost.
200. **RESEARCH. Yr; 2-5 cr.** A detailed study of a definite problem in the field of agricultural bacteriology. Prerequisites: Agr. Bact. 121, and 123, 124, 125, or 130. Lab. fee \$2.25 per lab. cr. Staff.
231. **SEMINARY. Yr; 1 cr.** Discussion of the research work of the department and of current problems in the fields covered by the department. Staff.

AGRICULTURAL CHEMISTRY

- EDWIN BRET HART, B.S., *Professor of Agricultural Chemistry, Chairman*
 WILLIAM HAROLD PETERSON, Ph.D., *Professor of Agricultural Chemistry*
 HARRY STEENBOCK, Ph.D., *Professor of Agricultural Chemistry*
 WILLIAM EDWARD TOTTINGHAM, Ph.D., *Associate Professor of Agricultural Chemistry*
 KARL PAUL LINK, Ph.D., *Associate Professor of Agricultural Chemistry*
 JAMES WADDELL, Ph.D., *Research Associate in Agricultural Chemistry*
 CONRAD ARNOLD ELVEHJEM, Ph.D., *Instructor in Agricultural Chemistry*
 SEYMOUR WILLIAM FREDERICK KLETZIEN, Ph.D., *Instructor in Agricultural Chemistry*
 BLANCHE MARYE RIISING, B.S., *Instructor in Agricultural Chemistry*
 HENRY THOMAS SCOTT, Ph.D., *Instructor in Agricultural Chemistry*

The courses offered in this department are intended to give a broad view of farm chemistry useful to the general agricultural student, and to develop men fitted for instructional or experimental work in the various fields of chemical activity applied to agriculture. Courses 120 and 122 are for students desiring a more detailed knowledge of the special subjects treated and are preliminary to greater specialization. These courses should be preceded or accompanied by work in biology and organic chemistry. Physiology and bacteriology are desired prerequisites. All other advanced courses in this department are open to undergraduates and graduates who have had the necessary preliminary training.

1. **AGRICULTURAL CHEMISTRY. II; 3 cr.** A general discussion of chemistry applied to the farm, including the chemistry of plants and animals and the processes involved in their growth. Prerequisite: Chemistry 1b or concurrent registration. Mr. Elvehjem.

2. **AGRICULTURAL ANALYSIS. II; 2 cr.** Analytical chemistry applied to agricultural materials; quantitative analysis of soils, fertilizers, manures, feeding stuffs, and insecticides. Prerequisites: Chemistry 1b and 12. Lab. fee \$4.50. Mr. Elvehjem.
3. **HOUSEHOLD CHEMISTRY. I; 5 cr.** The composition, physical properties, and nutritive value of foods; chemistry of the home, cleaning materials, dyes, etc. Required of all home economics students. Prerequisite: Chemistry 1b. Lab. fee \$6.75. Mr. Peterson.
100. **THESIS. Yr; 2 cr.** May be taken in plant, animal, fermentation, or dairy chemistry. Lab. fee \$2.25 per lab. cr. Mr. Hart, Mr. Peterson, Mr. Steenbock, Mr. Tottingham.
120. **PLANT CHEMISTRY. II; 2 or 5 cr.** The mechanism and course of chemical processes in the growth of plants, including the effect of environmental factors. Selected methods for the determination of plant constituents. Prerequisites: Chemistry 1b and 120. Lab. fee \$2.25 per lab. cr. Mr. Tottingham.
121. **DAIRY CHEMISTRY. I; 2 or 5 cr.** The chemistry of milk and its products, including the chemistry of fermentation and detection of adulterants. Prerequisites: Chemistry 1, 12, and 120. Lab. fee \$2.25 per lab. cr. Mr. Hart.
122. **ANIMAL CHEMISTRY. I; 2 or 5 cr.** The chemistry of feeds, processes of digestion, use of nutrients, and metabolic changes involved in the nutrition of animals. Prerequisites: Chemistry 1, 12, and 120. Lab. fee \$2.25 per lab. cr. Mr. Steenbock.
124. **ADVANCED BIO-CHEMISTRY. I, II; 1-3 cr.** A survey of important analytical processes used in the study of bio-chemical problems. Prerequisites: Chemistry 1, 12, 120, and Agr. Chem. 122. Lab. fee \$2.25 per lab. cr. Mr. Waddell.
125. **THE VITAMINS. II; 1-3 cr.** Lectures and laboratory work on the vitamins, including the animal technique used in their identification. Prerequisite: Agr. Chem. 122. Lab. fee \$2.25 per lab. cr. Mr. Steenbock.
126. **MODERN VIEWS OF ANIMAL NUTRITION AND THEIR APPLICATION. II; 2 cr.** A course of lectures and conferences on the newer knowledge of nutrition applied to man, poultry, dairy cattle, swine, etc. Prerequisite: Agr. Chem. 122. Mr. Hart.
127. **FERMENTATION BIO-CHEMISTRY. II; *cr.** Lectures and laboratory work on the chemistry and bacteriology of fermentation. Lab. fee \$2.25 per lab. cr. Mr. Peterson, Mr. Fred.
128. **CARBOHYDRATE CHEMISTRY. I; *cr.** Laboratory work with conferences on the chemistry of the carbohydrates. Includes a study of the properties and methods of separation and identification of the more important sugars. Lab. fee \$2.25 per lab. cr. Mr. Link.
230. **PLANT NUTRITION. Yr; *cr.** The influence of fertilizers upon the development and composition of plants in field and pot experiments, including the effects of environmental factors. Prerequisite: Agr. Chem. 120. Lab. fee \$2.25 per lab. cr. Mr. Tottingham.

231. ANIMAL NUTRITION. Yr; *cr. Composition and digestibility of foods and their influence upon growth, production of milk, etc. Prerequisite: Agr. Chem. 122. Lab. fee \$2.25 per lab. cr. Mr. Hart.
232. ADVANCED DAIRY CHEMISTRY. Yr; *cr. The proximate analysis of milk and its products, and a study of the changes which occur in the manufacture of dairy products. Prerequisites: Agr. Chem. 121. Lab. fee \$2.25 per lab. cr. Mr. Hart.
233. SEMINARY. Yr; 1 cr. Original articles of importance are studied in detail, to broaden and deepen the understanding and to act as a stimulus to further research. Mr. Hart and staff.

AGRICULTURAL ECONOMICS

BENJAMIN HORACE HIBBARD, Ph.D., *Professor of Agricultural Economics, Chairman*

JOHN HARRISON KOLB, Ph.D., *Professor of Rural Sociology*

PRESTON ESSEX MCNALL, M.S., *Professor of Agricultural Economics*

GEORGE SIMON WEHRWEIN, Ph.D., *Professor of Agricultural Economics*

ELLIS LORE KIRKPATRICK, Ph.D., *Associate Professor of Rural Sociology*

HENRY HARRISON BAKKEN, M.A., *Assistant Professor of Agricultural Economics*

ISAAC FULTS HALL, Ph.D., *Assistant Professor of Agricultural Economics*

ARTHUR F. WILEDEN, M.S., *Assistant Professor of Rural Sociology*

JOHN SWEET DONALD, B.S., D.D.S., *Lecturer in Agricultural Economics*

MILES CHARLES RILEY, LL.B., *Lecturer in Agricultural Economics*

MARVIN ARNOLD SCHAARS, M.S., *Instructor in Agricultural Economics*

RUDOLPH KNUGAARD FROKER, M.A., *Instructor in Agricultural Economics*

The courses in agricultural economics are intended to give the students a knowledge of the economic principles which relate to the production and marketing of farm products, and to the economic and social conditions of the agricultural classes. As such it is a field of general interest to all concerned with farmers and their welfare.

There are two methods of taking agricultural economics. First, it may be taken as a joint major along with work in one or more other departments, economics being recognized as a phase of farming coordinate with many other lines of inquiry; second, agricultural economics may be taken as a full major by those who decide to make it a main line of study preparatory to teaching, research, or work of an economic character. The major consists of 15 credits, including the thesis.

1. PRINCIPLES OF AGRICULTURAL ECONOMICS. I; 3 cr. Application of economics to agriculture. Required of all agricultural students. Prerequisite: Economics 1a. Mr. Hibbard.
8. FARM RECORDS AND ACCOUNTS. II; 2 cr. Inventories, bookkeeping, and accounting principles as applied to farm operations. Mr. Mitchell.
10. FARM ORGANIZATION AND MANAGEMENT. II; 3 cr. Farm methods and practices as applied to business management on the farm. Mr. McNall.

14. FARM BUSINESS AND LEGAL PRACTICE. II; 3 cr. Mr. Riley.
25. RURAL LIFE. I; 3 cr. The rural life movement with special attention given to the group organization of rural society; rural social institutions, such as the family, the school, the church, social and welfare agencies; principles and policies of rural community organizations. Prerequisite: Sophomore standing. Mr. Kolb.
100. THESIS. Yr; 2 cr. Staff.
107. FARM COST ACCOUNTING. II; 2 cr. Systems of cost accounting in their application to the problems of farm organization and operation. Prerequisite: Agr. Econ. 8. Mr. McNall.
117. OUTLINES OF LAND ECONOMICS. I; 3 cr. This course undertakes to cover the theoretical principles underlying landed property including the theories of rents, taxation, and conservation, together with the leading facts of land utilization. Prerequisite: Econ. 1a. Mr. Hibbard.



SEMINARY GROUP IN AGRICULTURAL ECONOMICS

Problems of co-operation, marketing, farm management, farm credit and land tenure are of greatest importance to the nation.

126. RURAL STANDARDS OF LIVING. II; 2 cr. Origin, development, and contact of rural standards of living; prevailing rural standards respecting food, clothing, housing, operating, health, and advancement; factors conditioning rural standards; and relation of community arrangements and institutions. Prerequisite: Junior standing. Mr. Kirkpatrick.
127. COOPERATIVE MARKETING. II; 2 cr. The structure, business essentials, policies, scope, and merchandising of cooperative corporations. Examination of the principal cooperative marketing companies, their consumer brands, reasons for success, and influence upon their respective industries. Prerequisite: Agr. Econ. 128. Mr. Schaars.
128. MARKETING OF FARM PRODUCTS. II; 3 cr. Essential marketing services, methods employed and agencies operating the marketing system. Consideration of price making forces, weaknesses in marketing agencies, avenues of improvement, governmental relations and marketing status of leading farm products. Prerequisite: Econ. 1a, or middle course sophomore standing. Mr. Schaars.
150. ECONOMIC THOUGHT AND THE FARM PRESS. II; 2 cr. Mr. Hibbard.

152. FARMER MOVEMENTS. I; 2 cr. A discussion of the great farmer movements such as the Grange, the Alliance, and the American Farm Bureau Federation. Prerequisite: Agr. Econ. 1. Mr. Hibbard.
180. TOPICAL WORK. Yr; *cr. Staff.
200. RESEARCH. Yr; *cr. Cooperation and marketing, Mr. Bakken, Mr. Schaars; Farm surveys and financial accounts in their relation to farm management, Mr. McNall; Cost accounting and its relation to farm management, Mr. McNall; History of agricultural production, Mr. Hibbard; Rural life, Mr. Kolb; Farmer movements, taxation and farm credit, Mr. Hibbard; Land economics and land problems, Mr. Wehrwein.
221. LAND INCOME. II; 2 cr. The economic characteristics of land; the economics of land utilization with reference to costs and income; theories of rent; valuation and taxation of land. Mr. Wehrwein.
225. SEMINARY IN RURAL SOCIAL ORGANIZATION. I; 2 cr. The theory and practice of rural social organization related to rural population groups, to villages and small town groups, and to towns and county organization policies. Emphasis is given to research methods of study. Prerequisite: Agr. Econ. 25. Mr. Kolb.
226. LAND PROBLEMS. Yr; 2 cr. The economic status of the agricultural classes with special reference to the relations of landlord and tenant. Prerequisite: Agr. Econ. 117 or 229 or concurrent registration. Mr. Hibbard, Mr. Wehrwein.
229. ADVANCED AGRICULTURAL ECONOMICS. Yr; 2 cr. The fundamentals of economics in their application to agricultural problems. Recent works in English, German, and French will be used. Prerequisite: Agr. Econ. 1 or Econ. 1a. Mr. Hibbard.

AGRICULTURAL EDUCATION

JOHN AMBROSE JAMES, B.S., *Professor of Agricultural Education, Chairman*
 KIRK LESTER HATCH, B.S., *Professor of Agricultural Education*
 THOMAS LYMAN BEWICK, M.S., *Professor of Agriculture*
 VINCENT EARL KIVLIN, M.S., *Assistant Professor of Agricultural Education*
 IVAN GLEN FAY, B.S., *Assistant Professor of Agriculture*
 WARREN WILLIAM CLARK, B.S., *Associate Professor of Agricultural Extension*

Students in the College of Agriculture who wish to prepare for the teaching of agriculture in secondary schools must complete, in addition to a major, the general requirements of the Long Course in Agriculture and the fifteen credits in education required for the University Teachers' Certificate as outlined below. The major consists of a minimum of fifteen elective credits in any department of the College of Agriculture but preferably in Agricultural Education.

Students who receive the degree of Bachelor of Science (Agriculture) and who have satisfied the following requirements are entitled to receive the University Teachers' Certificate and a license to teach issued by the State Superintendent: (a) registration in the School of Education at the beginning of the junior year, (b) the recommendation of the College of Agriculture, (c) the completion of the following courses:

	Credits
Educ. 31—Principles of secondary education	3
Educ. 75—Psychology and practice of teaching	5
Agr. Educ. 1—Rural education	2
Agr. Educ. 301—Program building in vocational agriculture...	2
Agron. 302—Teaching of agriculture	3
	15

Students beginning work for a certificate may arrange their courses most satisfactorily by starting to meet the requirements during the second semester of the sophomore year or the first semester of the junior year. Education 31 and 75 should definitely be completed before the beginning of the senior year. During the senior year the three courses in agricultural education are prescribed. This provides the best sequence and one which interferes least with technical subjects. Students should secure a list of



A WISCONSIN "GRAD" TEACHING FARMERS OF THE FUTURE
Students in agricultural education do practice work with
classes of high school age.

the desirable technical agricultural elective courses from the chairman of the Department of Agricultural Education, and discuss with him the requirements for the certificate.

Graduates of the professional courses of the state teachers' colleges who are majoring in agriculture and who wish to qualify for the University Teachers' Certificate, should elect 8 credits as follows:

	Credits
Education (advanced)	3-4
Agricultural Education (advanced; or 302)	3
Agricultural Education 301	2

Candidates may be excused from the departmental teachers' course with the approval of the Chairman of the Department of Agricultural Education.

MAJOR. Not more than 5 credits in education taken in Letters and Science may count on the major in agricultural education. These 5 credits shall in no way be counted as a portion of the 50 credits required in the strictly agricultural subjects.

There is a demand for men trained as principals and superintendents for rural communities and small cities. Teachers' college graduates and others with teaching experience are urged to consider this opportunity. The opportunity for electives outside this college makes it possible to take many courses in the Department of Education and thus to prepare for this field.

1. **RURAL EDUCATION.** I; 2 cr. Origin and development of vocational education for rural communities. Problems, principles, and practices of rural education. For future leaders, farmers, and teachers. Open to sophomores. Mr. James.
5. **JUNIOR EXTENSION.** I; 2 cr. Place of boys' and girls' clubs in rural education. Educational values, methods of organization, leadership, meetings, demonstrations, follow-up materials, exhibits and reports. For prospective extension workers and teachers. Lectures and demonstrations. Mr. Bewick.
25. **RURAL LIFE (Ag. Econ. 25).** I; 3 cr. Counts as part of education major. Mr. Kolb.
100. **THESIS.** Yr; 2 cr. Original work on problems of agricultural extension or teaching. Staff.
103. **SEMINARY.** I, II; *cr. Special problems in rural education and educational problems of county agent, demonstrator, extension workers, teachers, and rural leaders. Mr. James.
110. **TRAINING COURSE FOR COUNTY AGENTS.** II; 2 cr. Development and administration of the county agent system. The agent's responsibilities to the federal and state governments and the community. Projects, plans for work, and county organization; relation of college specialists and local organization. Open only to seniors and graduate students. Mr. Clark.
200. **RESEARCH.** Yr; *cr. Topical work relative to problems of elementary, vocational, or college agricultural education; extension, county agent, or demonstration work. Mr. James, Mr. Clark.
301. **PROGRAM BUILDING IN VOCATIONAL AGRICULTURE.** II; 2 cr. Factors determining the program of work, directed practice, part-time and evening schools, etc., adapted to teaching agriculture in secondary schools. Prerequisites: Agr. Educ. 1 and senior standing. Mr. Kivlin.
302. **TEACHING OF AGRICULTURE.** I, II; 3 cr. Directed teaching based upon participation in agricultural activities of the Wisconsin High School, problems of subject matter and methods of teaching. Open only to seniors registered for a teachers' certificate. Mr. Kivlin.

AGRICULTURAL ENGINEERING

EDWARD RICHARD JONES, M.S., *Professor of Agricultural Engineering, Chairman*

FLOYD WALDO DUFFEE, B.S., *Professor of Agricultural Engineering*

FREDERICK GROVER WILSON, B.S.F., *Assistant Professor of Forestry*

OTTO REINHART ZEASMAN, B.S., *Associate Professor of Soils and Agricultural Engineering*

MARVIN FREDERICK SCHWEERS, B.S., *Instructor in Agricultural Engineering*

Aggressive, alert men with an agricultural background supplemented by thorough training in technical engineering are in keen demand by rural power, construction, and reclamation companies and the manufacturers of farm machinery and equipment.

Students inclined toward engineering and desiring to return to their farms or to take positions as agricultural agents or farm managers or to enter the farm equipment business, are advised to major in non-technical agricultural engineering, which has no special requirement in mathematics. They are advised to take, in addition to their major studies, liberal electives in soils, agronomy, agricultural economics, and business methods. A non-technical major in agriculture may be combined with a University Teachers' Certificate giving the legal qualifications to teach in the high schools.

Those desiring to enter the more technical field, or mechanical, electrical, civil, or structural engineering as applied to agriculture, are recognized as majors in technical agricultural engineering, and are requested to consult the department chairman before or during the first semester of the freshman year so that the proper sequence of studies in mathematics, drawing, and mechanics may be followed, substituting Mathematics 51 for Mathematics 71 and then shaping Curriculum B so as to include in addition to the required courses in the College of Agriculture, Mathematics 52, 54, and 55, Drawing 1, 2, and 3, Mechanics 1 and 2, and Physics 51 and 52 in the College of Engineering. In addition to graduating from agriculture at the end of four years, it is possible for these men to finish a course in civil, mechanical, or electrical engineering at the end of the fifth year.

Throughout the year the majors in both technical and non-technical agricultural engineering function as a student branch of the American Society of Agricultural Engineers, and during the first semester of both junior and senior years they take Agricultural Engineering 121, if possible.

About one-third of the work included in each of the courses listed below is made technical for students who have sufficient prerequisites in mathematics and mechanics; and more general for students without such prerequisites, but with more farm experience.

1. LAND SURVEYING AND DRAINAGE. I; 3 cr. Surveying and engineering as applied to land drainage. Subdivision of land, chaining, levelling, mapping, computing, and designing for drainage systems. Lectures accompanied by field work, drafting, and laboratory tests. Laying tile on university marsh. Optional subject for all agricultural students. Lab. fee \$4.50. Mr. Jones.
2. FARM STRUCTURES. I; 3 cr. The arrangement, construction economics, and design of the farm house, barns, and other farm buildings. Strength and selection of materials in the economical design of farm structures. Preparation of bills of material and estimates of cost from plans and specifications. Lectures, laboratory, drafting room, and field practice. Lab. fee \$2.25. Mr. Jones.

3. **GAS ENGINES. I; 3 cr.** Construction and operation of gasoline engines; electrical generators; application of power to farm work. It is desirable to have this course preceded by course 14. Lab. fee \$4.50. Mr. Duffee.
4. **CONCRETE CONSTRUCTION. II; 2 cr.** Use of concrete in farm building work. Selection and proportioning of concreting materials; general principles of concrete construction. Reinforced concrete. Field practice on local concrete work. Offered 1930-31 and in alternate years. Lectures, field work, and laboratory practice. Lab. fee \$2.25. Mr. Jones.



GOING TO THE MARSH

Practical work in drainage is done by students in the course, Agricultural Engineering 1.

5. **FARM FIELD MACHINERY. II; 3 cr.** Lectures and laboratory studies on the construction and operation of tools and machinery for preparing the seed bed, sowing and planting, tilling and harvesting farm crops. Optional subject for all agricultural students. Lab. fee \$2.25. Mr. Duffee.
8. **DOMESTIC ENGINEERING AND PRACTICE. I; 2 cr.** Water supply, sanitation, heating, and lighting of farm houses and operation of household equipment. Rope work, belt-lacing, soldering, and babbitting. Lab. fee \$2.25. Mr. Schweers.
100. **THESIS. Yr; 2 cr.** Lab. fee \$2.25 per lab. cr. Staff.
101. **ADVANCED GAS ENGINES AND FARM TRACTORS. II; 3 cr.** Laboratory tests of gas engines and field practice with farm tractors. Prerequisite: Agr. Engr. 3. Lab. fee \$4.50. Mr. Duffee.
102. **DRAINAGE DESIGN. II; 2 cr.** Preliminary and final surveys and designs for farm and community drainage systems near Madison and other convenient places. Optional work is provided for those specializing in irrigation. Field work and conferences by appointment. Prerequisite: Agr. Engr. 1 or Top. Engr. 1 and 2. Mr. Jones.
105. **BELT AND TRACTOR MACHINERY. II; 2 cr.** Threshers, silo fillers, and other belt-driven farm machines, large and small; tractor plow; ma-

- chinery calibration tests. Lectures, laboratory studies, and field demonstrations. Prerequisites: Agr. Engr. 5 and 101 or concurrent registration. Offered 1929-30 and in alternate years. Lab. fee \$2.25. Mr. Duffee.
121. SEMINARY. I; 1 cr. Review of current literature and studies of agricultural engineering problems. For juniors, seniors, and graduate students. Mr. Jones and staff.
122. EXPLOSIVES. II; 1 cr. Principles and practices in the use of explosives in agriculture and industry, including demolition of old structures and excavation for new ones. Lectures, laboratory, and field work during the spring recess. Lab. fee \$2.25. Mr. Rowlands.
200. RESEARCH. I, II; *cr. Special problems in farm buildings, farm machinery, farm power, forestry, land clearing, or land drainage are assigned to advanced students who have had the necessary previous training. Lab. fee \$2.25 per lab. cr. Mr. Jones and staff.



A TYPICAL SCIENTIFIC LABORATORY

Our many laboratories are in constant use by students or for research.

ELECTIVES IN THE COLLEGE OF ENGINEERING

- SHOP 2. BENCH WORK, FORGE, AND WELDING. I, II; 1 cr. Forge and bench work in iron and steel. The processes involved in forging, welding, and brazing of iron and steel. The use of the chisel, file, and drill in finishing and fitting. Lab. fee \$3.00. Mr. Hollander.
- SHOP 15. GENERAL FARM CARPENTRY. I, II; 1 or 2 cr. The use and care of tools and principles involved in the construction of such structures as concrete forms and farm buildings; framing of doors and windows, and interior finishing. Lab. fee \$3.00. Mr. Cluley.

ELECTIVES GIVEN BY FOREST PRODUCTS STAFF

1. FORESTRY AND UTILIZATION OF WOOD. I; 2 cr. General introductory course. Includes identification of native trees, forest conditions and forest policy in the United States and utilization of wood. Mr. Tiemann.
102. WOOD TECHNOLOGY. II; 2 cr. Includes a study of the formation, structure, and properties of wood, laboratory identification of United States species of wood. Forms a logical sequence to Course 1 but can be taken independently. Especially suited for students who expect to go into some wood-using business, or for students intending to specialize in forestry elsewhere. Mr. Tiemann.

AGRICULTURAL JOURNALISM

ANDREW WINKLE HOPKINS, B.L., *Professor of Agricultural Journalism, Chairman*

WILLIAM ALLISON SUMNER, B.S., *Associate Professor of Agricultural Journalism*

GRACE LANGDON, M.A., *Instructor in Agricultural Journalism*

RUPERT HENRY RASMUSSEN, M.S., *Instructor in Agricultural Journalism*

The ability to write simple, understandable English is invaluable to the teacher, extension worker, county and home demonstration worker, and farmer. To render the greatest service the technically trained worker must use the printed page. Selling and advertising are important in the neglected half of farming—the business side. More and more farmers are coming to appreciate the need of salesmanship, sales letter writing, effective classified and display advertisement, and systematic sales campaigns.

For students returning to the farm, Agricultural Journalism 1 and 3 are suggested. For prospective teachers and extension workers, courses 1, 3 and 103 are recommended. For research workers and future college staff workers Agricultural Journalism 1, 103, and 105 are advised.

Majors in the department will be expected to take Agricultural Journalism 1, 2, 3, 100, 103, 111, 150, and 200. Courses in the Department of Journalism in the College of Letters and Science may be taken and not to exceed 5 credits from the following courses may count on the major: Journalism 2, Newspaper reporting and correspondence; Journalism 3, Copy reading; Journalism 7, Community newspaper; Journalism 104, Editorial writing.

1. WRITING FARM NEWS. I, II; 3 cr. An elementary course to help students who expect to write news articles about farming for publication in the weekly or daily papers or the various agricultural journals. Mr. Sumner.
2. PRACTICE IN EDITING. I, II; 1 cr. The editorial, business, and circulation problems of the Wisconsin Country Magazine are analyzed and actual practice given on the magazine. Mr. Sumner.
3. AGRICULTURAL ADVERTISING. II; 3 cr. How to write "want ads", advertisements to sell livestock, dairy products, fruit, berries, truck, food products; how to write the business letters of the farmer; the preparation of booklets, posters, sales bills, and other mediums. Lectures and assignments for practice. Mr. Sumner.

8. **WRITING HOME ECONOMICS NEWS.** I; 3 cr. A course in the fundamentals of writing home economics material. Designed to aid teachers and extension workers in publicity and to give training to students who plan to make a profession of journalism. Mr. Sumner.
100. **THESIS.** Yr; 2 cr. Original studies of a journalistic or advertising nature. Practical problems are investigated. Mr. Hopkins, Mr. Sumner.



EVERY AG NEEDS THE "MAG"

The editors of the Country Magazine learn the business of writing articles by actual experience.

103. **AGRICULTURAL PUBLICITY METHODS.** II; 2 cr. Outlining and finding effective methods of publicity. This course takes up the publicity campaign, the different mediums as to their advantage and uses, publicity copy, exhibits, and charts. Prerequisite: Agr. Journ. 1 or 8. Mr. Hopkins.
104. **THE HISTORY OF FARM PAPERS.** II; 2 cr. A survey of the farm paper field, past and present. Mr. Sumner.
105. **WRITING AND EDITING FARM BULLETINS.** I; 2 cr. A course for those who have to use or write station or extension bulletins and circulars. Mr. Sumner.
106. **ADVERTISING SURVEY FOR HOME ECONOMICS.** II; 2 cr. A general course to present to the home economics student who expects to enter the business world, a background of sales and advertising methods and practices. Mr. Sumner.
111. **WRITING FARM AND HOME FEATURES.** II; 2 cr. A course to follow the elementary courses in writing farm and home stories. The technique of writing the longer feature stories for the farm papers and women's magazines is given primary consideration. Prerequisite: Agr. Journ. 1 or 8. Mr. Sumner.
150. **SEMINARY.** I, II; 2 cr. Mr. Sumner.
200. **RESEARCH.** I, II; *cr. A practice problem such as confronts the county agent, scientist, publicity man, extension worker, or editor is analyzed and an effort made for a constructive solution. Advertising problems and policies such as confront the breeder or pure-bred seed grower may be studied. Prerequisite: Agr. Journ. 1, 3, or 8. Mr. Hopkins, Mr. Sumner.

AGRONOMY

RANSOM ASA MOORE, *Professor of Agronomy, Chairman*
 EDMOND JOSEPH DELWICHE, M.S., *Professor of Agronomy*
 LAURENCE FREDERICK GRABER, M.S., *Professor of Agronomy*
 GEORGE BYRON MORTIMER, B.S., *Professor of Agronomy*
 BENJAMIN DONALD LEITH, B.S., *Professor of Agronomy*
 GEORGE McSPADDEN BRIGGS, B.S., *Associate Professor of Agronomy*
 ANDREW HAMILTON WRIGHT, M.S., *Associate Professor of Agronomy*
 ALDEN LESCOMBE STONE, *Assistant Professor of Agronomy*
 EUGENE DAVENPORT HOLDEN, M.S., *Assistant Professor of Agronomy*

GENERAL MAJOR. Students majoring in agronomy and wishing to prepare for the business of farming, farm managers, county agricultural agents, crop reporting positions, commercial positions in seed trade, or teachers of secondary school agriculture, should pursue Curriculum B, electing 10 credits from the following: Physics 61, 5 cr.; Zoology 3, 3 cr.; Geology 1, 5 cr.; Geography 4, 5 cr.; Geography 104, 2 cr.; Botany 2, 5 cr.; Chemistry 11, 3-5 cr.; Mathematics 2, 4 cr.; Mathematics 3, 3 cr. In addition the regular course requirement must be taken as prescribed.

It is suggested that the courses selected in agronomy be taken in the following order: For the sophomore year, 120, 3 cr.; 102, 2 cr.; for the junior year, 106, 3 cr.; for the senior year, 107, 2 cr.; 121, 3 cr.; 130, 3 cr.; 131, 2 cr.

General majors desiring to teach secondary school agriculture should note the regular teacher training requirements given under Agricultural Education.

SPECIAL MAJOR. Students desiring to prepare as professional agronomists such as plant breeders, either institutional or commercial research and extension specialists, teachers, or seed analysts should take a more specialized major emphasizing scientific subjects. In the sophomore year Chemistry 11, 3 cr., and Zoology 3, 3 cr., should be taken, together with an additional 4 cr. in either science or mathematics. Soils 1, 5 cr., and Agricultural Chemistry 1 and 2, 5 cr., are suggested. In the junior year, Chemistry 20, 4 cr., Botany 109, 3 cr., and Genetics 101, 3 cr. In the senior year, Chemistry 130, 5 cr., Soils 127, 2 cr., and Plant Pathology 101, 3 cr.

Departmental requirement should be followed as suggested under the general major with the addition of Agronomy 205, 2 cr., in the senior year. If graduate work is intended a foreign language should be added beginning with the junior year. A thesis may be taken in either major with the consent of the adviser. Not to exceed five credits from the following courses may be counted as a portion of the major requirement in Agronomy: Soils 120, Soil management; Soils 127, Soil science and plant nutrition; Plant Pathology 101, Diseases of plants; Plant Pathology 116, Diseases of field crops; Botany 109, Structure of economic plants; and Botany 129, Classification of cultivated plants.

1. **GENERAL FARM CROPS.** I, II; 3 cr. Includes a study of varieties and types, botanical relations, adaptations, cultural practices, judging, and studies of individual crops. Required of all agricultural students. Lab. fee \$4.50. Mr. Mortimer.
100. **THESIS.** Yr; 2 cr. Lab. fee \$2.25 per lab. cr. Staff.
101. **SPECIAL CROP PROBLEMS.** Yr; *cr. Offered at Madison and the branch experiment stations. Lab. fee \$2.25 per lab. cr. Staff.

- 102 PASTURES AND PASTURE PROBLEMS. I; 2 cr. Pasture studies based on kinds; best methods of establishing, maintaining and improving them; and the crops best suited to this use. Prerequisite: Agronomy 1. Mr. Mortimer.



FARM MANAGEMENT AND CROP ROTATION

A class in agronomy considering the problems of crop rotation and their relation to the management of the farm.

106. FORAGE CROPS. II; 3 cr. Growing and handling forage crops, with emphasis on recent developments in relation to livestock farming. Prerequisite: Agronomy 1. Mr. Moore, Mr. Graber.
107. FORAGE PROBLEMS. II; 2 cr. Physiological, anatomical, and morphological aspects of forage plants in relation to field practices, with emphasis on food reserves, winter injury, and other agronomic problems. For seniors and graduate students. Lab. fee \$4.50. Mr. Graber.
120. SEED AND WEED CONTROL. I; 3 cr. A study of the economic relations of farm seeds and weeds to profitable agriculture. Prerequisite: Agronomy 1. Lab. fee \$4.50. Mr. Stone.
121. GRAIN PRODUCTION AND CROP JUDGING. II; 3 cr. Varieties, uses, distribution, and approved practices in growing, together with judging competitive farm crop displays. Prerequisite: Agronomy 1. Lab. fee \$4.50. Mr. Mortimer.
130. PLANT BREEDING. II; 3 cr. Methods and principles involved in the improvement of crops. Prerequisites: Agronomy 1 and Botany 1. Mr. Leith.
131. SEMINARY. Yr; 1 cr. A review of current literature and studies of agronomic problems. For seniors and graduate students. Prerequisites: Agronomy 1 and Botany 1. Staff.
200. RESEARCH. Yr; *cr. Agronomic problems for students qualifying for advanced degrees. Given in connection with thesis or graduate study. Lab. fee \$2.25 per lab. cr. Staff.
205. CROP ENVIRONMENT. II; 2 cr. Reports and discussions on the findings in fields related to crop plants, and their interrelations. Offered 1930-31 and in alternate years. Mr. Wright.

ANIMAL HUSBANDRY

GEORGE COLVIN HUMPHREY, B.S., *Professor of Animal Husbandry, Chairman*
 GUSTAV BOHSTEDT, Ph.D., *Professor of Animal Husbandry*
 JAMES GARFIELD FULLER, M.S., *Professor of Animal Husbandry*
 ARLIE MAX MUCKS, B.S., *Associate Professor of Animal Husbandry*
 JOHN MERRILL FARGO, M.S., *Assistant Professor of Animal Husbandry*
 ISAAC WALKER RUPEL, M.S., *Assistant Professor of Animal Husbandry*
 ARTHUR OWEN COLLENTINE, *Instructor in Animal Husbandry*
 ALBERT JULIUS CRAMER, B.S., *Instructor in Animal Husbandry*
 ROY THEODORE HARRIS, *Instructor in Animal Husbandry*
 JAMES JEROME LACEY, *Instructor in Animal Husbandry*
 BENJAMIN HAMILTON ROCHE, M.S., *Instructor in Animal Husbandry*

Two majors are offered students in animal husbandry. The practical major is intended primarily for students who intend to return to the farm either at home or as farm managers or herdsmen. Students taking this major should follow Curriculum B, electing Chemistry 12, Quantitative analysis, 3 cr., and Agr. Chem. 1 and 2, 5 cr., in their sophomore year. In the junior year they should elect Physiology 3, Animal physiology, 4 cr., in addition to animal husbandry courses in feeding, breeding, and production. In the senior year Agr. Journalism 3, Advertising, 3 cr., Dairy Husbandry 5, City milk supply, 3 cr., and Agr. Bact. 121, Dairy bacteriology, 3 cr., are suggested in addition to animal husbandry production courses.

The scientific major is planned for men desiring to go into college or experiment station work and is suggested for those intending to do extension work. For training in this field Curriculum A should be followed, electing Veterinary Science 1, 3 cr., and Dairy Husbandry 1, 3 cr., in the sophomore year. Organic chemistry should be taken in the junior year in addition to courses suggested in the practical major. In the senior year desirable electives, in addition to some production courses, are Agr. Chem. 121; Dairy chemistry, 2 or 5 cr.; Agr. Chem. 122, Animal chemistry, 2 or 5 cr.; and Genetics 101 and 102, 5 cr. Not to exceed five credits from the following courses may be counted as a portion of the major requirement in animal husbandry: Agr. Chem. 121 and 122, Genetics 101 and 102, Veterinary Science 2 and 3.

1. LIVESTOCK PRODUCTION. I, II; 3 cr. Livestock survey, breed history, judging, market classification; practical problems, lectures, and laboratory exercises. Required of all agricultural students. Lab. fee \$4.50. Mr. Fuller.
100. THESIS. Yr; 2 cr. Lab. fee \$2.25 per lab. cr. Mr. Humphrey and staff.
124. ANIMAL BREEDING. II; 2 cr. The principles and approved methods relating to the breeding of livestock. Prerequisite: An. Husb. 1. Mr. Fargo.
126. LIVESTOCK FEEDING. I; 4 cr. A study of the principles of feeding and the composition of feeds; practice in formulating rations for the various classes of livestock; evaluation of feeds and feeding practices from a study of experiments and customs. Prerequisite: An. Husb. 1. Mr. Bohstedt, Mr. Rupel.
129. SHEEP PRODUCTION. II; 2 cr. A study of breed history and judging; farm flock management for production of market and pure-bred sheep,

- including wool-grading and judging; fattening western lambs for market. Prerequisite: An. Husb. 1. Lab. fee \$2.25. Not offered 1930-31.
130. SWINE PRODUCTION. I; 3 cr. Judging of breeding and market hogs; history of the hog industry in America; systems and costs of production and marketing; the hog carcass and consumption of pork products; and the breeding, feeding, and management of breeding and market hogs. Prerequisites: An. Husb. 1 and 126. Lab. fee \$4.50. Mr. Fargo.
131. HORSE PRODUCTION. I; 2 or 3 cr. Pedigree work, conformation study, judging, production problems, and fundamentals in breaking and hitching. Prerequisite: An. Husb. 1. Lab. fee \$2.25. Mr. Fuller.
132. BEEF CATTLE PRODUCTION. II; 2 cr. Pedigree work, judging, feeding, and marketing beef cattle; production problems. Prerequisite: An. Husb. 1. Lab. fee \$2.25. Mr. Fuller.
133. DAIRY CATTLE AND MILK PRODUCTION. II; 3 cr. Selection of animals for milk production and for breeding purposes. Present day types and breed characteristics. Herd management, advanced registry testing, calf raising, selling of surplus breeding stock. Control measures relating to quality in commercial and special grades of milk. A two-day tour to visit leading pure-bred herds, dairy equipment plants, and farms producing certified milk is required; the cost is from \$10.00 to \$15.00. Prerequisite: An. Husb. 1. Lab. fee \$4.50. Mr. Rupel.
134. SPECIAL PROBLEMS. Yr; *cr. Special problems on feeding, management, breeding, or judging of livestock, including laboratory, library, or field work with conferences and reports. These problems will be assigned by respective members of the staff. Consent of instructor required. Lab. fee \$2.25 per lab. cr. Mr. Fuller and staff.
135. ANIMAL HUSBANDRY SEMINARY. Yr; 1 cr. Studies and discussions of research work in animal husbandry and related fields; reports on articles of interest. For advanced and graduate students. Mr. Bohstedt.
200. RESEARCH. Yr; *cr. A detailed study of a definite research problem in animal husbandry. Conference on experimental methods. Lab. fee \$2.25 per lab. cr. Mr. Bohstedt and staff.

DAIRY HUSBANDRY

HOWARD CAMPBELL JACKSON, Ph.D., *Professor of Dairy Husbandry, Chairman*
 WALTER VAN PRICE, Ph.D., *Professor of Dairy Husbandry*
 HUGO HENRY SOMMER, Ph.D., *Professor of Dairy Husbandry*
 JOHN LANGLEY SAMMIS, Ph.D., *Associate Professor of Dairy Husbandry*
 LOUIS CHARLES THOMSEN, B.S., *Assistant Professor of Dairy Husbandry*
 HANS TJELLESEN SONDERGAARD, *Instructor in Dairy Husbandry*

The department offers instruction in the science and art of manufacturing dairy products, suited to the needs of (a) farm dairymen, (b) investigators or teachers, (c) managers, operators, or inspectors of creameries, cheese factories, city milk, ice cream plants, and condenseries.

Students majoring in dairy manufacturing should follow Curriculum B, electing Chemistry 12, 3 cr., Physics 61, 5 cr., Chemistry 20 or 120, 5 cr., Agricultural Chemistry 1 and 2, 5 cr., and Dairy Husbandry 1, 3 cr., in the sophomore year. Agr. Chem. 121, Dairy chemistry, 5 cr., and Agr. Bact. 121, Dairy bacteriology, 3 cr., should be taken in the junior year; and Dairy Husbandry 3, 4, and 5, 3 cr. each, and Dairy Husbandry 123, 2 cr., should be taken in the senior year as a minimum.

Dairy Husbandry is intimately connected with the Departments of Animal Husbandry, Agricultural Bacteriology, and Agricultural Chemistry, and with marketing given in the Department of Agricultural Economics. Students preparing for dairy manufacturing should consider courses in these departments when selecting electives related to the major.

1. INTRODUCTION TO DAIRYING. II; 3 cr. A general survey course designed to give the student an understanding of the relationship of dairy manufacturing to general farm problems. Emphasis is given to methods of quality control, judging, and elementary analysis of dairy products. Lab. fee \$4.50. Mr. Jackson, Mr. Thomsen.
3. CREAMERY OPERATION AND MANAGEMENT. I; 1-3 cr. The theory and practice of cream separation, the pasteurization and handling of dairy products under commercial conditions, composition and flavor control of butter, and the management and operation of creameries. Lab. fee \$2.25 per lab. cr. Mr. Jackson, Mr. Thomsen.
4. CHEESE-MAKING. I; 4 cr. A combined lecture and laboratory course to study the manufacture of cheese. Several types of cheese will be made by the students in the laboratory to acquaint them with commercial practices and to illustrate the importance of certain physical, chemical, and biological factors which influence curd-making and cheese-ripening. Lab. fee \$4.50. Mr. Price.
5. CITY MILK SUPPLY AND ICE CREAM MAKING. I; 3 cr. The commercial handling of market milk and preparations. Milk ordinances and board of health regulation of milk supplies. Theory and practice of ice cream making. Lab. fee \$4.50. Mr. Sommer.
8. DAIRY MECHANICS. II; 3 cr. Dairy plant construction, heating, ventilation, sewage disposal, refrigeration, installation and operation of dairy machinery. Lab. fee \$2.25. Mr. Thomsen.
100. THESIS. Yr; 2 cr. Lab. fee \$2.25 per lab. cr. Staff.
102. DAIRY PRACTICE. Yr; 1-4 cr. One credit for each 48 hours of work. Lab. fee \$2.25 per lab. cr. Mr. Jackson.
121. ADVANCED DAIRY MANUFACTURING PROBLEMS. Yr; 1-3 cr. Problems relating to dairy manufacturing. Lab. fee \$2.25 per lab. cr. Staff.
123. SEMINARY. Yr; 1 cr. For advanced and graduate students. Mr. Sommer and staff.
124. PHYSICAL CHEMISTRY OF DAIRY PRODUCTS. II; 3 cr. Physical chemistry of dairy products, laboratory exercises on hydrogen ion concentration, oxidation-reduction potentials, surface tension, absorption, viscosity and plasticity, isoelectric point of proteins, colloidal properties of milk constituents. Offered 1929-30 and in alternate years. Lab. fee \$4.50. Mr. Sommer.
200. RESEARCH. Yr; *cr. Experimental study of problems in dairy manufacturing. Lab. fee \$2.25 per lab. cr. Staff.

ECONOMIC ENTOMOLOGY

HARLEY FROST WILSON, M.S., *Professor of Economic Entomology, Chairman*
 CHARLES LEWIS FLUKE, JR., Ph.D., *Associate Professor of Economic Entomology*

ALEXANDER ANASTACIEVITCH GRANOVSKY, M.S., *Assistant Professor of Economic Entomology*

GEORGE EUGENE MARVIN, M.S., *Instructor in Economic Entomology*

CLEMENT HALL GRIFFITH, B.S., *Instructor in Economic Entomology*

Students majoring in economic entomology and desiring to be trained in entomological or beekeeping research for the positions offered by the state agricultural experiment stations and the government service, should follow Curriculum B. Those preparing for entomological chemical work, especially with insecticides, should elect more work in chemistry and physics. Students pursuing specialized lines, such as biological control of insects, insect physiology, and insects in relation to plant diseases, should elect more work in plant pathology, botany, and physiology.

Those interested in the opportunities in the field of entomology and beekeeping should write to the Department of Economic Entomology for a special circular of information.

1. FARM INSECTS. II; 3 cr. A study of the insect groups, especially those in relation to the farm and home. Each student makes a collection of at least one hundred specimens, which he classifies. Optional subject for all agricultural students. Lab. fee \$4.50. Mr. Fluke.
2. ELEMENTARY ECONOMIC ENTOMOLOGY. I; 3 cr. The fundamental principles of entomology are stressed, giving the student a foundation in the subject which prepares him for advanced studies of insects. Lab. fee \$4.50. Mr. Fluke.
10. ELEMENTARY BEEKEEPING. I; 2 cr. Elementary principles of beekeeping with lectures and practical laboratory work. A general survey of the subject is taken up, with the fall and winter care in the apiary being stressed. Lab. fee \$2.25. Mr. Marvin.
100. THESIS. Yr; 2 cr. Lab. fee \$2.25 per lab. cr. Mr. Wilson and staff.
103. ORCHARD INSECTS. II; 2 cr. A laboratory study of the life histories and controls of the principal insect pests of the orchard and bush fruits. Prerequisite: Economic Entomology 1 or 2, or Zoology 3. Offered 1930-31 and in alternate years. Lab. fee \$2.25. Mr. Fluke.
105. FIELD CROP AND GARDEN INSECTS. II; 2 cr. A laboratory study of the principal insect pests of field, garden, and truck crops; their life histories and controls. Prerequisite: Economic Entomology 1 or 2, Zoology 3. Offered 1929-30 and in alternate years. Lab. fee \$2.25. Mr. Granovsky.
110. COMMERCIAL HONEY PRODUCTION. II; 2 cr. Lectures and laboratory periods dealing with the yearly management of the apiary for intensified honey production, building up in the spring, swarm control, supering for the honey flow, and care of bees in the fall and winter. Lab. fee \$4.50. Mr. Marvin.
120. TAXONOMY AND TOPICAL WORK. I, II; *cr. a. Biological relations of insects; physiology of insects. b. Methods in entomology and insect photography. c. Taxonomy of insects. Prerequisite: Economic

- Entomology 1 or 2. Lab. fee \$2.25 per lab. cr. Mr. Wilson, Mr. Fluke, Mr. Granovsky.
125. INSECTS IN RELATION TO PLANT DISEASES. I; 2 cr. A study of the principal insect carriers and their habits; types of insect injuries affecting health of plants; modes of insect transmission and dissemination of plant diseases; and the methods of rearing and handling the carriers. Arranged to meet the needs of students in entomology, plant pathology, horticulture, and agronomy. Prerequisite: A course in entomology and plant pathology or consent of instructor. Lab. fee \$2.25. Mr. Granovsky.
130. SEMINARY. I, II; 1 cr. For advanced and graduate students. Mr. Wilson.
200. RESEARCH. Yr; *cr. Lab. fee \$2.25 per lab. cr. Mr. Wilson and staff.

GENETICS

LEON JACOB COLE, Ph.D., *Professor of Genetics, Chairman*
 ROYAL ALEXANDER BRINK, D.Sc., *Associate Professor of Genetics*

The following courses are designed for those who desire a general knowledge of the subjects of heredity and breeding, or who contemplate following these lines, either from the theoretical or practical point of view. Special opportunity is offered those doing advanced work to get practical experience in the methods of experimental breeding.

100. THESIS. Yr; 2 cr. Lab. fee \$2.25 per lab. cr. Mr. Cole, Mr. Brink.
101. PRINCIPLES OF BREEDING. I; 3 cr. Elementary principles of heredity in their application to plant and animal breeding. Additional prescribed reading and written reports for graduate credit. Prerequisite: A course in biology. Mr. Cole.
102. ELEMENTARY LABORATORY. I; 1-2 cr. Breeding experiments illustrating the principles of heredity. Prerequisite: Genetics 101 or concurrent registration. Lab. fee \$2.25 per lab. cr. Mr. Brink and staff.
104. PLANT GENETICS. I; 3 cr. Variation and inheritance in plants, including genetics of sterility and disease resistance, and principles of plant improvement. Prerequisite: Genetics 101 or equivalent in zoology or botany. Mr. Brink.
105. ANIMAL GENETICS. II; 2 cr. Inheritance of economic characters in domesticated animals; study of animal breeding methods; evaluation and analysis of pedigrees; application of genetics to the problems of livestock production. Prerequisite: Same as for Genetics 104. Mr. Cole.
106. BIOMETRIC METHODS. II; 2 cr. Lectures and laboratory work in calculation of statistical measures of variability and correlation and their practical application. Determination and usage of probable errors of such measures and for Mendelian data. Prerequisite: Same as for Genetics 104. Lab. fee \$4.50. Mr. Brink.
120. SEMINARY. Yr; 1 cr. Consent of instructor required before election. Mr. Cole.

121. **TOPICAL WORK.** Yr; *cr. Either (a) assigned topics in laboratory or field work with reading, conference, and report, or (b) practice work, including practical experience in the various lines of research carried on in the department; problems, technique, and methods of record keeping. For those not prepared to elect Course 200. May be taken in connection with, or subsequent to, Genetics 101; consent of instructor required. Lab. fee \$2.25 per lab. cr. Mr. Cole, Mr. Brink.
200. **RESEARCH.** Yr; *cr. For students qualified by preliminary training. Work may be based on the analysis of available data, or upon new data acquired by experiment. The summer season offers exceptional opportunity for breeding work with both animals and plants. Opportunity is offered to a limited number of properly qualified students for research under direction during the summer. Such work may extend through the whole season and is applicable toward advanced degrees. Lab. fee \$2.25 per lab. cr. Mr. Cole, Mr. Brink.

HORTICULTURE

- JAMES GARFIELD MOORE, M.S., *Professor of Horticulture, Chairman*
 JAMES JOHNSON, Ph.D., *Professor of Horticulture*
 JAMES GARFIELD MILWARD, M.S., *Professor of Horticulture*
 RAY HARLAND ROBERTS, Ph.D., *Professor of Horticulture*
 FRANZ AUGUST AUST, M.S., M.L.D., *Associate Professor of Horticulture*
 JOHN WILLIAM BRANN, M.S., *Assistant Professor of Horticulture and Plant Pathology*
 CONRAD LOUIS KUEHNER, B.S., *Assistant Professor of Horticulture*
 EARL FREDERICK BURK, M.S., *Instructor in Horticulture*
 GEORGE WILLIAM LONGENECKER, B.S., *Instructor in Horticulture*
 WILLIAM BUTLER OGDEN, B.S., *Instructor in Horticulture*

The courses offered in horticulture permit of the student specializing in fruit growing, landscape design, or vegetable production. The choice of electives taken in other departments to supplement horticultural courses will be determined by the specialization and the particular phase of the work the student expects to enter. Courses 1, 2, 5, 6, and 7 should be of particular interest to students specializing in other departments who are fitting themselves to be county agents, teachers in vocational or high schools, or farm managers or operators.

Majors in general horticulture may count a maximum of five credits towards the major requirement by electing Economic Entomology 1 and Plant Pathology 5. Students specializing in landscape gardening may count toward the major five credits in the above mentioned courses or in the following: Agricultural Economics 25, Applied Arts 52, 62, and Topographic Engineering 108. Such students are also referred to courses in city planning, offered by the College of Engineering; see page 280.

1. **PRINCIPLES OF FRUIT GROWING.** I; 3 cr. The principles of fruit growing and their application to our common tree fruits. Optional subject for all agricultural students. Lab. fee \$2.25. Mr. Moore.
2. **ADVANCED FRUIT GROWING.** Yr; 2 cr. Lecture and laboratory work dealing with orchard practice, pruning, spraying, cultivation, harvesting, storing, and marketing fruits. Prerequisite: Hort. 1 or consent of instructor. Lab. fee \$2.25. Mr. Roberts.

3. **VEGETABLE GARDENING.** II; 3 cr. Principles and practices involved in the growing of vegetables. Practical work in the gardens; hot-bed construction and manipulation. Lectures and laboratory. Optional subject for all agricultural students. Lab. fee \$4.50. Mr. Moore.
4. **VEGETABLE FORCING.** I; 3 cr. Principles involved in growing vegetables under glass with practical work in the forcing house. Forcing house construction and heating. Offered 1928-29 and in alternate years. Lab. fee \$4.50. Mr. Moore.
5. **SMALL FRUIT CULTURE.** I; 2 cr. Principles and practices of the successful culture of cane, bush, and other small fruits. Mr. Moore.
6. **LANDSCAPE GARDENING.** I; 3 cr. Discussion of the principles of landscape art. Field and laboratory work in the study of decorative plants and making of planting plans. A trip to some nursery will be taken for the purpose of studying plant materials and nursery practice. Lab. fee \$4.50. Mr. Aust, Mr. Longenecker.
7. **PLANT PROPAGATION.** II; 2 cr. Principles and practices involved in propagating horticultural plants. Lectures and laboratory. Lab. fee \$2.25. Mr. Moore.
8. **FLORICULTURE.** II; 3 cr. Propagation and care of greenhouse, garden, and lawn plants with reference to home floriculture. Designed for women. Lab. fee \$2.25. Mr. Moore.
11. **POTATOES AND TRUCK CROPS.** I; 2 cr. Lectures and laboratory work on the methods of growing and improving potatoes, including variety, identification, and disease control. Also a general consideration of the more important truck crops, as cabbage, onions, celery. Lab. fee \$2.25. Mr. Milward, Mr. Brann, Mr. Burk.
100. **THESIS.** Yr; 2 or more cr. Research work on horticultural subjects. Fees depend upon character of thesis work. Lab. fee \$2.25 per lab. cr. Mr. Aust, Mr. Johnson, Mr. Moore, Mr. Roberts.
110. **SEMINARY.** Yr; 1 cr. For advanced and graduate students. Mr. Roberts, Mr. Aust.



LANDSCAPE ART

An interesting field of work is found in landscape gardening.

121. HORTICULTURAL PROBLEMS. Yr; 1-5 cr. The student is assigned a special problem in the phase of horticulture in which he is particularly interested: (a) fruit-growing, Mr. Roberts, Mr. Moore; (b) gardening and floriculture, Mr. Moore; (c) landscape design, Mr. Aust; (d) plant materials, Mr. Aust; (e) landscape construction, Mr. Aust. Prerequisite: Consent of the instructor. Lab. fee \$2.25 per lab. cr.
122. SYSTEMATIC POMOLOGY. I; 3 cr. Classification, identification, judging and distribution of our common fruits. Prerequisite: Consent of instructor. Offered 1929-30 and in alternate years. Lab. fee \$4.50. Mr. Moore.
125. ADVANCED LANDSCAPE GARDENING. II; 2 to 5 cr. Continuation of Horticulture 6. Advanced work in landscape design and drafting. A trip is taken to Lake Geneva for the purpose of studying different landscape treatments. Prerequisite: Hort. 6. Lab. fee \$4.50. Mr. Aust, Mr. Longenecker.
126. RURAL IMPROVEMENT. I; 2-3 cr. A discussion of farmstead, community center, and regional planning and their relation to rural conditions. Lectures, assigned readings, reports. Prerequisite: Economics 1a. Mr. Aust.

LIBRARY

CLARENCE SCOTT HEAN, B.A., *Librarian*

1. LIBRARY PRACTICE. I; 1 cr. The classification and arrangement of books, filing of bulletins, use of card catalogs, periodical indexes, abstract journals, public documents, standard reference works, including handbooks in the various fields of knowledge, and the compiling of bibliographies. Mr. Hean.

PLANT PATHOLOGY

GEORGE WANNAMAKER KEITT, Ph.D., *Professor of Plant Pathology, Chairman*

JAMES GEERE DICKSON, Ph.D., *Professor of Plant Pathology*

BENJAMIN MINGE DUGGAR, Ph.D., *Professor of Botany and Plant Pathology*

EDWARD MARTINIUS GILBERT, Ph.D., *Professor of Botany and Plant Pathology*

LEWIS RALPH JONES, Ph.D., Sc.D., *Professor of Plant Pathology*

RICHARD ENGLISH VAUGHAN, M.S., *Professor of Plant Pathology*

JOHN CHARLES WALKER, Ph.D., *Professor of Plant Pathology*

ALBERT JOYCE RIKER, Ph.D., *Associate Professor of Plant Pathology*

JOHN WILLIAM BRANN, M.S., *Assistant Professor of Horticulture and Plant Pathology*

JOHN JEFFERSON DAVIS, B.S., M.D., *Curator of the Herbarium*

CLARICE AUDREY RICHARDS, Ph.D., *Lecturer in Forest Products*

Courses 104, 149, 220, 221, and 252 are offered in the Department of Botany, College of Letters and Science.

5. CROP DISEASES AND THEIR CONTROL. I; 2 cr. Lectures and demonstrations dealing with the occurrence, symptoms, and control of the

- more important diseases of the commonly cultivated crops. Lab. fee \$2.25. Mr. Vaughan and staff.
100. **THESIS.** Yr; 2 cr. Investigation of some problem in plant pathology. Subject should be chosen early, preferably the preceding spring, in order to take advantage of the summer session to secure material. Lab. fee \$2.25 per lab. cr. Mr. Jones and staff.
101. **DISEASES OF PLANTS.** I; 3 cr. The nature, causes, and remedies of the diseases of economic plants, including field and laboratory studies of a typical series of examples. Prerequisites: Botany 1 and Agr. Bact. 1. Lab. fee \$4.50. Mr. Walker, Mr. Gilbert.
102. **METHODS IN PLANT PATHOLOGY.** I; 3 cr. Isolation of parasites, technique of cultural methods, spore germination, and infection. Prerequisite: Plant Path. 101. Lab. fee \$4.50. Mr. Keitt and staff.
104. **MORPHOLOGY OF FUNGI.** I; 3 cr. Prerequisite: Botany 1. Lab. fee \$3.50. Mr. Gilbert.



STUDYING PLANT DISEASES

Farmers lose thousands of dollars each year through plant disease.
Most plant diseases can be controlled or prevented.

116. **DISEASES OF FIELD CROPS.** II; 2 cr. Arranged to meet the needs of students in plant pathology and agronomy. Prerequisite: Plant Path. 101. Offered 1929-30 and in alternate years. Lab. fee \$2.25. Mr. Dickson.
117. **DISEASES OF ORCHARD FRUITS.** II; 2 cr. A study of the more important diseases of deciduous orchard fruits. Prerequisite: Plant Path. 101. Offered 1929-30 and in alternate years. Lab. fee \$2.25. Mr. Keitt.
119. **DISEASES OF TIMBER.** I; 2 cr. A survey of fungi causing rot in living trees and structural timbers, and control measures. Prerequisite: Plant Path. 101. Offered 1929-30 and in alternate years. Lab. fee \$2.25. Miss Richards.

120. DISEASES OF VEGETABLE CROPS. II; 2 cr. A study of the more important field and storage diseases of vegetable crops. Prerequisite: Plant Path. 101. Offered 1930-31 and in alternate years. Lab. fee \$2.25. Mr. Walker.
122. FUNGICIDES IN RELATION TO HOST AND PARASITE. II; 1 cr. Advanced course, primarily intended for students specializing in plant pathology and horticulture. Prerequisite: Plant Path. 101. Offered 1930-31 and in alternate years. Mr. Keitt.
149. SPECIAL PHYSIOLOGY OF PATHOGENIC FUNGI. II; 2 cr. Prerequisite: Botany 146. Mr. Duggar.
200. RESEARCH. Yr; *cr. Lab. fee \$2.25 per lab. cr. Staff.
220. ADVANCED MYCOLOGY. Yr; 2 cr. Prerequisite: Botany 104. Lab. fee \$2.00 per semester. Mr. Gilbert.
221. CLASSIFICATION OF PARASITIC FUNGI. Yr; 1 cr. Prerequisite: Botany 104 or Plant Path. 101. Mr. Davis.
223. SEMINARY IN PLANT PATHOLOGY. Yr; 1 cr. For advanced and graduate students. Mr. Jones and staff.
252. CYTOLOGY OF FUNGI. II; *cr. Prerequisite: At least one semester of general cytology. Lab. fee \$2.00 per cr. Mr. Gilbert.

POULTRY HUSBANDRY

JAMES GARFIELD HALPIN, B.S., *Professor of Poultry Husbandry, Chairman*
 JOHN BARRY HAYES, B.S., *Associate Professor of Poultry Husbandry*
 CLAYTON ERNEST HOLMES, B.S., *Instructor in Poultry Husbandry*
 GERALD EVERETT ANNIN, B.S., *Instructor in Poultry Husbandry*

Students majoring in poultry husbandry may prepare for commercial poultry farming, for one of the various lines of commercial work with which poultry husbandry is related, or for educational work in extension, instruction, or research. Poultry majors should supplement their training by electing such courses as Animal Husbandry 126, Agr. Chem. 1 and 2, Agr. Econ. 127 and 128, and Genetics 101. Students preparing for educational work along the more scientific lines should elect Chemistry 20 or 120, Agr. Chem. 122, Zoology 103 and 105. Opportunities are provided for students majoring in poultry husbandry to become familiar with methods of poultry management by working at the university poultry plant, local hatcheries, etc. Not to exceed five credits from the following courses may be counted as a portion of the major requirement in poultry husbandry: Veterinary Science 125, Diseases of Poultry; Animal Husbandry 126, Live-stock feeding; Agr. Chem. 122, Animal chemistry; Agr. Econ. 127, Cooperative Marketing; Agr. Econ. 128, Marketing farm products; and Genetics 105, Animal genetics.

1. POULTRY RAISING. I; 3 cr. A general survey course designed to give the student an understanding of the various problems concerned in poultry raising. Emphasis is given to the study of the various breeds and varieties, breeding and selection for egg production, and the housing of laying hens for egg production. Optional subject for all agricultural students. Lab. fee \$2.25. Mr. Halpin, Mr. Holmes.

2. **POULTRY FEEDING. II; 2 cr.** A study of the feeding, breeding, and management of poultry. Mr. Holmes.
5. **ARTIFICIAL INCUBATION AND BROODING. II; 1-3 cr.** Designed to give poultry majors and other students interested in poultry a thorough understanding of the factors influencing the hatchability of eggs; a practical study of chick embryology; practical problems in the operation of incubators and brooders. Prerequisite: Poultry Husbandry 2 or concurrent registration. Lab. fee \$2.25 per lab. cr. Mr. Holmes.
8. **MARKETING POULTRY PRODUCTS. I; 2 cr.** A consideration of those factors tending to produce quality in market poultry. Laboratory practice in fattening, dressing, grading, and packing various classes of market poultry; a consideration of those factors tending to produce quality in market eggs. Laboratory practice in candling, grading and packing market eggs; methods of marketing poultry products. Prerequisite: Poultry Husbandry 1. Lab. fee \$2.25. Mr. Holmes.
100. **THESIS. Yr; 2 cr.** Mr. Halpin, Mr. Holmes.
106. **POULTRY JUDGING. I; 3 cr.** Origin, history, and points of excellence of the various breeds and varieties of poultry as described in the American Standard of Perfection. A study of the inheritance of common characters in poultry. Prerequisite: Poultry Husbandry 1 or Genetics 101. Lab. fee \$2.25. Mr. Halpin.
107. **ADVANCED POULTRY MANAGEMENT. II; 3 cr.** Influence of recent investigations in poultry husbandry as they affect modern methods of feeding, housing, breeding, care and management of poultry. Special emphasis on rations and practices where poultry is kept on a large scale. Prerequisites: Poultry Husbandry 1 and 2 or Animal Husbandry 126. Mr. Halpin.
200. **RESEARCH PROBLEMS. Yr; *cr.** Lab. fee \$2.25 per lab. cr. Mr. Halpin, Mr. Holmes.



STUDENT JUDGES AT THE INTERNATIONAL

Each year a group of our students take part in the collegiate judging contest at Chicago.

SOILS

ANDREW ROBINSON WHITSON, B.S., *Professor of Soils, Chairman*

FRED LUDWIG MUSBACH, B.S., *Professor of Soils*

EMIL TRUOG, M.S., *Professor of Soils*

CLINTON JOSEPH CHAPMAN, B.S., *Associate Professor of Soils*

EDWARD JOHN GRAUL, M.S., *Associate Professor of Soils*

OTTO REINHART ZEASMAN, B.S., *Associate Professor of Soils and Agricultural Engineering*

ARTHUR ROBERT ALBERT, B.S., *Assistant Professor of Soils*

HAROLD HAIGHT HULL, M.S., *Instructor in Soils*

Soils 1 is prerequisite to all other courses in soils. Soils 122 may be elected by middle course sophomores. Soils 1 and 120 are general in character and are adapted to the needs of all students of agriculture. Advanced students specializing in this subject are advised to elect courses in chemistry, soils bacteriology, plant physiology, agronomy, or geology, according to their special needs, during their senior and graduate years. The summer period is particularly suited to advanced work in soil fertility; for courses offered see summer session bulletin.

GENERAL MAJOR. Students majoring in soils and preparing for practical farming, positions as farm manager, teacher of agriculture, or county agricultural agent, should follow Curriculum B, taking Physics 61, 5 cr., Botany 146, 4 cr., and science or mathematics, 5 cr.; and select the courses in soils in the following order: For the sophomore year, 1, 5 cr.; 122, 3 cr.; for the junior year, 120, 2 cr.; for the senior year, 127, 2 cr.; 128, 2 cr.; and thesis, 4 cr., or 121, 4 cr. In addition to these suggestions, students are urged to elect courses in the Departments of Agronomy, Botany, Agricultural Economics, Agricultural Engineering, Animal Husbandry, Bacteriology, and Geology to supplement the required work in soils. General majors desiring to teach should consult the chairman of the Department of Agricultural Education concerning requirements not later than the beginning of the junior year.

TECHNICAL MAJOR. Students desiring to prepare for the work of soil surveying, land classification, or field experimentation should follow the general suggestions given above for the general major, but choose supplementary electives from the following group: Agr. Engr. 5, 102; Agronomy 102, 106, 120; Botany 109; Chemistry 11 or 12; Geology 1, 11; Soils 121.

Students preparing to become soil chemists should take Curriculum B with Soils 1, 5 cr., and Soils 122, 3 cr., in the sophomore year Soils 127, 2 cr., and Soils 121, 4 cr., in the junior year; and Soils 120, 2 cr., Soils 125, 3 cr., Soils 100, 4 cr., and Soils 128, 2 cr. in the senior year. In addition, Chemistry 12, 3 cr., Zoology 3, 3 cr., Geology 2, 3 cr., Agronomy 106, 3 cr., should be elected in the sophomore year; Chemistry 120, 3 or 5 cr., and a language in the junior year; and Agr. Bact. 123, 4 cr., Chemistry 130, 5 cr., Agronomy 102, 2 cr., in the senior year.

Students are urged to consult a member of the department not later than the second semester of their sophomore year so that a logical sequence of courses may be arranged. Agr. Bact. 123, Soils bacteriology, will be considered as a part of the major.

1. PRINCIPLES OF SOIL FERTILITY. I; 5 cr. Discussions and laboratory work on the formation, composition, tilth, and fertility of soils in relation to the growth of plants. Prerequisite: Chemistry 1b or concurrent registration. Lab. fee \$4.50. Mr. Graul and staff.

100. THESIS. Yr; 2 cr. Lab. fee \$2.25 per lab. cr. Mr. Whitson and staff.
120. SOIL MANAGEMENT. I; 2 cr. Lectures and field work, maintenance of fertility, including principles of fertilizer practice, and adaptation of system of agriculture to type of soil and climate. Prerequisite: Soils 1. Mr. Whitson.
121. SOIL ANALYSIS. II; 4 cr. Lectures and laboratory. Soil acidity methods, limestone analysis, determination of essential elements, availability methods, complete soil analysis. The use of chemical analysis in soil diagnosis. Prerequisites: Soils 1, Chemistry 12. Lab. fee \$4.50. Mr. Truog.
122. SOIL PHYSICS AND TILLAGE. II; 2-3 cr. Lectures and laboratory. The physical properties of the soil constituents, tilth, soil moisture, heat, in relation to the growth of plants, with practical applications to farm practice. Prerequisite: Soils 1. Lab. fee \$2.25 per lab. cr. Mr. Graul.
125. AGRICULTURAL CLIMATOLOGY; SOIL AND LAND CLASSIFICATION. II; 3 cr. Lectures and field work in soil mapping. The principles of climatology and soil and land classification in relation to agriculture, including a study of the soils and climate of the United States and of the chief foreign countries. Prerequisite: Soils 1 or graduate standing. Mr. Whitson.
127. SOIL SCIENCE AND PLANT NUTRITION. I; 2 cr. Lectures and discussions. The constitution of the soil, especially as a medium for plant growth. The newer applications of scientific principles to such problems as soil acidity, use of fertilizers, soil amendments, and toxic agents. Prerequisite: Soils 1 or graduate standing. Mr. Truog.
128. SEMINARY IN SOILS. I, II; 1 cr. Mr. Whitson, Mr. Truog.
180. TOPICAL WORK. Yr; *cr. Mr. Whitson, Mr. Truog, Mr. Graul.
200. RESEARCH. I, II; *cr. Lab. fee \$2.25 per lab. cr. Mr. Whitson, Mr. Truog, Mr. Graul.
228. FIELD COURSE. Yr; 2-4 cr. Soil and crop rotation problems, soil acidity and legumes, farm soil survey, factors determining fertility balance sheet, planning and use of experimental and demonstrational fertilizer plots. Prerequisite: Soils 1. Mr. Whitson, Mr. Musbach, Mr. Albert.

VETERINARY SCIENCE

FREDERICK BROWN HADLEY, D.V.M., *Professor of Veterinary Science,*
Chairman

ALEXANDER SEPTIMUS ALEXANDER, F.H.A.S., M.D.C., *Professor of Veterinary Science*

BURR ABRAHAM BEACH, D.V.M., *Associate Professor of Veterinary Science*

CHARLES ROY STRANGE, D.V.M., *Instructor in Veterinary Science*

The courses described below have been planned to give the students an appreciation of the various branches of veterinary science. They are taught largely by the laboratory method. Besides giving information needed for

the intelligent care and management of sick animals, they aid advanced students to secure a knowledge of animal breeding, animal pathology, and veterinary bacteriology.

1. **THE ANIMAL BODY.** I; 3 cr. The structure, functions, and derived products of the animal body. The student learns about the form, capacity and productivity of farm animals as well as the fundamentals relative to their feeding and breeding. Optional subject for all agricultural students. Lab. fee \$4.50. Mr. Hadley.
2. **DISEASES OF HORSES AND SWINE.** II; 2 cr. Their causes, symptoms, prevention and treatment, including conformation and soundness. Mr. Hadley.
3. **DISEASES OF CATTLE AND SHEEP.** I; 2 cr. Their causes, symptoms, prevention, and treatment. Mr. Hadley, Mr. Alexander.
100. **THESIS.** Yr; 2 cr. Mr. Hadley, Mr. Beach.
124. **TOPICAL WORK.** Yr; *cr. Assigned work for advanced students. Mr. Hadley and staff.



LABORATORY WORK IN VETERINARY SCIENCE

These students are learning how the animal body is constructed and works.

125. **DISEASES OF POULTRY.** II; 2 cr. A study of the more common diseases of poultry. Prerequisite: Vet. Science 1 or Poultry Husb. 1. Offered 1929-30 and in alternate years. Mr. Beach.
126. **INFECTION AND IMMUNITY.** II; 3 cr. An experimental study of the principles of infection and immunity. Prerequisite: A course in bacteriology. Offered 1930-31 and in alternate years. Lab. fee \$4.50. Mr. Hadley and staff.
200. **RESEARCH.** Yr; 2 cr. Lab. fee \$2.25 per lab. cr. Mr. Hadley, Mr. Beach.

**When you are through with this catalog,
please pass it on to a friend.**