# Courses in agriculture: 1933-1934. 1933

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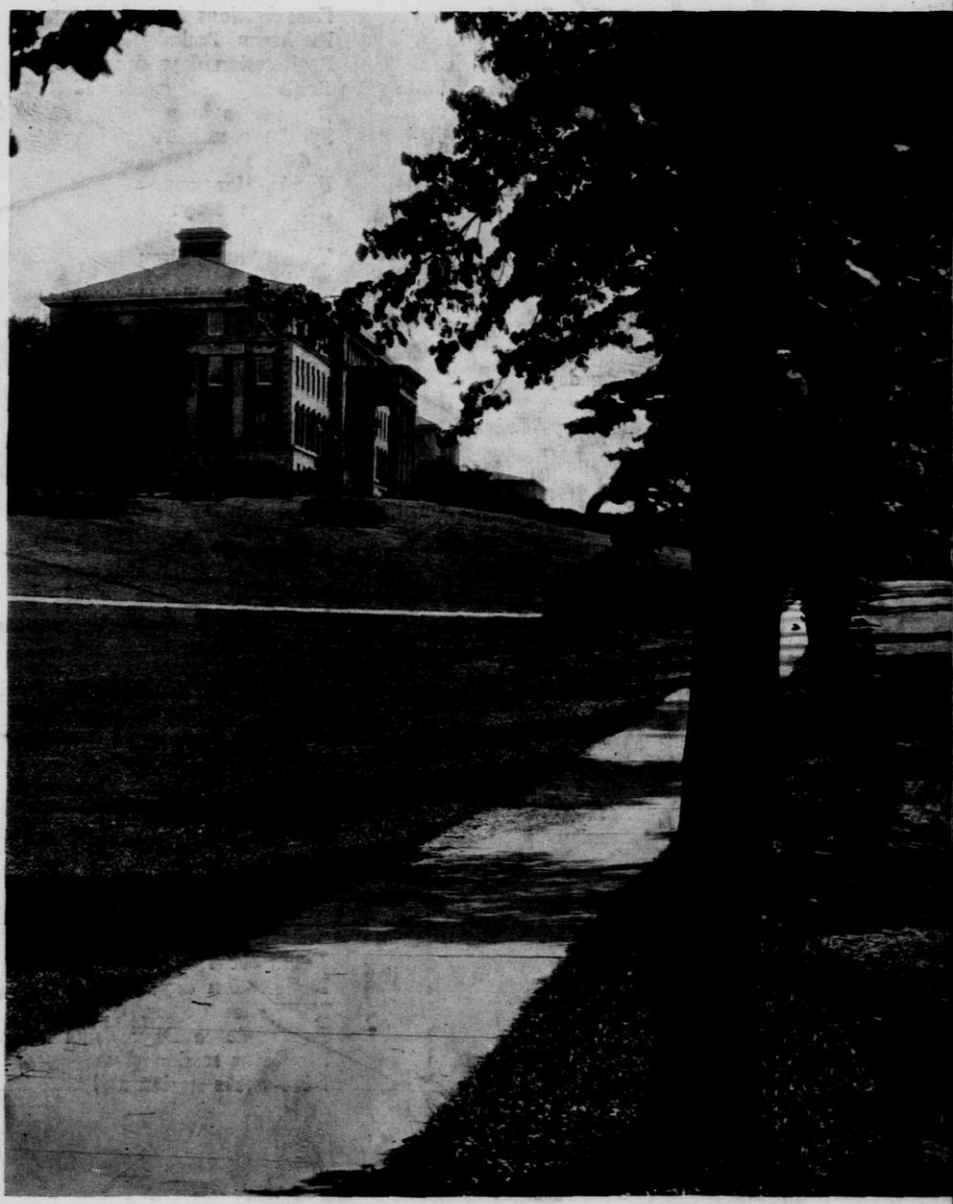
# Courses in Agriculture



## 1933-1934

College of Agriculture, University of Wisconsin, Serial No. 1900
Bulletin of the University of Wisconsin. General Series No. 1684

# CALENDAR

## ACADEMIC YEAR 1933-34

### FIRST SEMESTER

| | | |
|---|---|---|
| Sept. 8, 9 | Friday, Saturday | Examinations for admission |
| Sept. 13-19 | Wed.-Tues. noon | Freshman Period (attendance required) |
| Sept. 15-19 | Friday-Tuesday noon | Registration days for other new students |
| Sept. 16-19 | Saturday-Tuesday noon | Registration days for old students |
| Sept. 20 | Wednesday | Instruction begins |
| Sept. 23 | Saturday | Special examinations for removal of conditions |
| Sept. 30 | Saturday | Foreign language attainment examinations |
| Nov. 11 | Saturday | Armistice Day: legal holiday (one day only) |
| Nov. 30 | Thursday | Thanksgiving Day: legal holiday (one day only) |
| Dec. 20 | Wednesday noon | Christmas recess commences |
| Jan. 4 | Thursday 8 a.m. | Instruction resumed |
| Jan. 13 | Saturday | Foreign language attainment examinations<br>Examinations for removal of conditions |
| Jan. 22-31 | Monday-Wednesday | Final examinations |

### SECOND SEMESTER

| | | |
|---|---|---|
| Jan. 29, 30 | Monday, Tuesday | Examinations for admission |
| Feb. 1 | Thursday | Registration day for new and re-entered students |
| Feb. 5 | Monday | Instruction begins |
| Feb. 22 | Thursday | Washington's birthday: legal holiday |
| April 3 | Tuesday, after last class | Spring recess commences |
| April 11 | Wednesday 8 a.m. | Instruction resumed |
| April 14 | Saturday | Examinations for removal of conditions |
| May 12 | Saturday | Foreign language attainment examinations |
| May 30 | Wednesday | Memorial Day: legal holiday |
| June 4-12 | Monday-Tuesday | Final examinations |
| June 11, 12 | Monday, Tuesday | Examinations for admission |
| June 16 | Saturday | Alumni day |
| June 17 | Sunday | Baccalaureate day |
| June 18 | Monday | Commencement day |

## SUMMER SESSION 1934

| | | |
|---|---|---|
| June 18 | Monday | Law School opens |
| June 25 | Monday | Registration day, University at large |
| June 26 | Tuesday | Instruction begins, University at large |
| July 4 | Wednesday | Independence Day: legal holiday |
| August 3 | Friday | Six-weeks session closes |
| August 24 | Friday | Nine-weeks session and Law School close |

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# Courses in Agriculture

NEVER BEFORE in the field of agriculture was the need for education so great as it is today. And never before was the man without an education handicapped as he is today. New developments in the fields of distribution and marketing have transformed the farmer from a mere producer of raw food stuffs to a business man with a definite interest in the economic and social well being of his community and the world at large.

Agriculture today needs not only men trained for actual farm operations, but also specialists in the various branches of agriculture for service in the schools, in the state and federal bureaus, and in the industries related to agriculture. The curriculum in the Wisconsin College of Agriculture is designed to serve these needs and is sufficiently flexible to give a broad general education in the cultural and scientific subjects, as well as practical training in agriculture. Here is a field worthy of the best young men of the nation. It will try their mettle and reward their industry and intelligence.

### Opportunities in Agriculture

The great scope of the agricultural field provides a correspondingly wide range of opportunities for the trained man. Graduates of the College of Agriculture are finding useful and satisfactory careers as farm operators, either owners or managers, as teachers, club leaders, or county agents, as workers in the commercial enterprises related to agriculture and as scientists in the state, federal, or industrial laboratories.

A recent survey of the graduates of this College, covering a range of 51 years, found them occupying over 100 different types of positions. Seventeen per cent of the graduates were farm operators, 22 per cent were in commercial or industrial work related to agriculture, 38 per cent were in educational or scientific agricultural positions and 23 per cent were in non-agricultural fields.

*Farm operators.* Successful farming of the present is founded on economical production of a high quality product, but in addition to this there must be an orderly distribution and satisfactory marketing of this product. The problems of distribution and marketing are no longer

individual and can be met only by the cooperative activities of farmers. The success or failure of these cooperatives will in the end depend upon the intelligence and training of the farmers. The permanent solution of the agricultural problem will only be attained by the education of the farmer, not alone in the arts and sciences of agriculture but also in the economic and social fields.

The young man who wishes to operate his own farm or to manage a farm for another will find that the training received in the College of Agriculture will be worth many times its cost, both in the increased income and the enriched life which will result.

*Teachers and Extension Workers.* Many agricultural graduates have found the field of rural education very attractive. Teachers in the rural high schools, 4-H Club leaders and county agricultural agents are all aiding in training the farmers in the science of economical production and in the new problems of cooperative endeavor. Work in these fields offers a splendid opportunity for service to agriculture and the state, and at the same time offers an opportunity for a return on the time and money invested in a college education.

*Agricultural Scientists.* The development of agricultural colleges and state and federal experiment stations has furnished positions for a large percentage of the Wisconsin agricultural graduates. The men in these fields have prepared themselves as experts in some field of agricultural science. Frequently they have continued their study beyond the four years of college work and have secured the M.S. or Ph.D. degree. Almost every phase of natural and social science is represented in the agricultural field and students are offered a wide latitude of choice in selecting their major line of study.

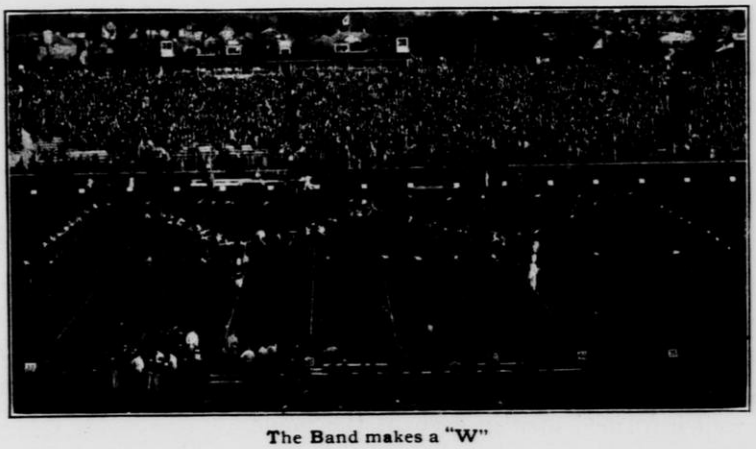
The future development of agricultural science depends upon the constant recruiting of capable young men for these fields, and splendid opportunities are waiting for the intelligent and industrious young man.

*Agricultural Commerce and Industry.* With the rapid development of the industries related to agriculture and with the constantly increasing importance of agricultural commerce, there has arisen a demand for agriculturally trained men in many parts of the business world. Such industries as feed and fertilizer manufacturing, the seed trade, the dairy products plants, the canning companies, the agricultural machinery concerns, and the meat packing establishments are furnishing splendid opportunities for agricultural college graduates. Others are finding positions with the large banks, trust companies, railroads, or insurance companies in their agricultural divisions. Agricultural economics,

Harold Smith

Kenneth Ryckman

Paul Ellicker



The Band makes a "W"

Ray Wichman

Kenneth Kundert

David Tubias


George Wright

landscape gardening and agricultural journalism are offering commercial opportunities to others.

### Facilities and Resources

As one unit of the University of Wisconsin, the College of Agriculture combines the advantages of the large university and the smaller college. All of the courses and resources of the University in general are available to the Agricultural College student. All of the basic science and cultural studies are carried outside of the College of Agriculture and wide latitude is offered the student in his selection of courses in any department of the University.

The presence of the Wisconsin Agricultural Experiment Station and the Wisconsin Agricultural Extension Service as integral parts of the College of Agriculture offers many additional opportunities to the agricultural student. He has an opportunity to follow the progress of the agricultural research work and in many instances to help with it. The extension workers bring back to the College the constantly shifting picture of agricultural conditions throughout the state and the student is thus kept informed of changing conditions.

The College possesses an excellent physical plant and equipment. The Experiment Station laboratories, equipment, and livestock, much of which is available for student use, give the College a wonderful advantage. Ten large buildings as well as numerous smaller ones, such as barns and greenhouses, are devoted exclusively to the College of Agriculture. The library, located in Agricultural Hall, is one of the finest in the Middle West. The staff of the College is large enough to offer well informed men in each of the fields.

## Courses Offered

THE College of Agriculture offers five different courses or types of work; the Long Course, the Middle Course, the Short Course, the Winter Dairy Course, and Graduate Work.

*The Long Course* gives the most thorough type of training and offers the most opportunities to graduates. Four scholastic years are required for the completion of this work and it leads to the degree of Bachelor of Science in Agriculture. The course is planned to insure a thorough education in cultural subjects, basic sciences and practical agriculture. The central core of the work consists of courses which are required of all, but ample opportunity is offered for the student to elect work which will fit him for particular lines of work. The curriculum and plan of the course are described in more detail on page 12.

*Graduate Work* is offered for those desiring further specialization in various lines of agriculture. The staff and the equipment of the entire University are available for this work and offer excellent opportunities. The chairman of the department concerned should be addressed for additional information.

*The Middle Course* is planned to give most of the practical agricultural work of the Long Course, with less however of the cultural and basic science features. see page 13 for a complete description.

*The Short Course* consists of two winter sessions of fifteen weeks each and is designed to give young men training for the business of farming. Special courses are offered covering the practical application of science to the problems of production, marketing and rural life. A special circular describing this course may be obtained by writing V. E. Kivlin, Director.

*The Winter Dairy Course* offers an opportunity for young men who have some practical experience in a dairy manufacturing plant to secure training in the basic sciences and in the newer methods of handling dairy products. The work is offered in the winter months and covers a term of twelve weeks. For further information write H. C. Jackson, Dairy Department.

*Studies by correspondence.* No purely agricultural courses are given by correspondence. Courses which are required of or may be elected by students in the College of Agriculture, such as English, mathematics, botany, and economics and others, may be taken by correspondence and where such work is satisfactorily completed may be applied toward graduation. For further information address the University Extension Division.

## Admission

THERE are four methods for admission to the College of Agriculture for the Long or Middle Course: (1) Certification of the satisfactory completion of certain high school work; (2) Examination covering the work of high school grade; (3) Adult special students; and (4) Advanced standing students, from universities, colleges, normals, etc.

### 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 the 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.

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 universty 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.

## Entrance Requirements

Entrance requirements are stated in units of high-school work, a term which is not to be confused with the term *credit* as applied to university work. A unit represents five class periods a week in one branch of study for a school year of at least 36 weeks. Two laboratory periods in any science or vocational study are considered as equivalent to one class period. In closely allied subjects, such as botany and zoology, not usually taught throughout the entire year, units may be constructed by adding the respective time values of the subjects. Three periods a week for a year and a half may be counted as one unit.

Fifteen units, distributed as follows, are the fundamental requirement for regular admission to any college or course in the University:

I. Two units of English are required of all entrants; three units are recommended for all and are required of those who do not offer two units of foreign language. One unit of algebra and one of geometry are also required of all, with an additional half or whole unit of algebra recommended for those interested in the technical agricultural engineering major.

II. Two units of science or history, or two units of one of the following foreign languages—French, German, Greek, Hebrew, Italian, Latin, Norse, or Spanish—must be presented by all. If foreign language is offered there must be at least two units in a single language, although in exceptional cases one unit may be offered as the optional subject.

III. The remaining units necessary to bring the total to fifteen must be offered from groups A and B, with a maximum of four units from Group B and a total of not more than four units in any single subject.

## Group A

| | Units |
|---|---|
| English | 1-2 |
| Foreign language | |
| French | 1-4 |
| German | 1-4 |
| Greek | 1-3 |
| Hebrew | 1-2 |
| Italian | 1-2 |
| Latin | 1-4 |
| Norse | 1-2 |
| Spanish | 1-4 |

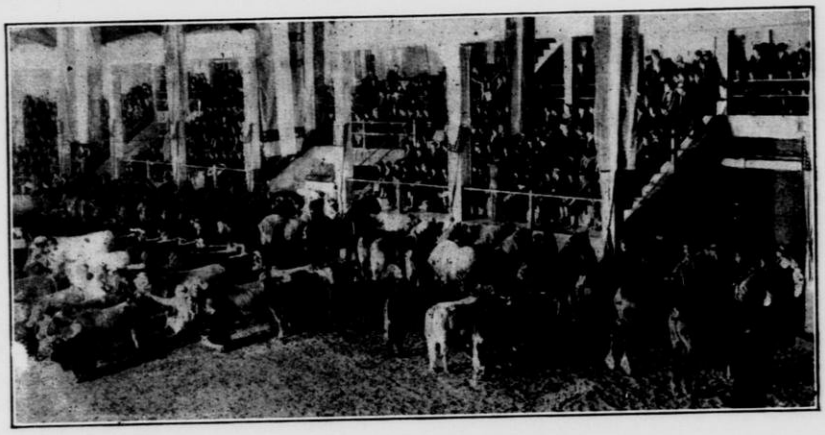
| | Units |
|---|---|
| History and Civics | |
| History | 1-4 |
| Civics | ½-1 |
| Economics | ½ |
| Mathematics | |
| Advanced algebra | ½-1 |
| Solid geometry | ½ |
| Trigonometry | ½ |

| | Units |
|---|---|
| Science | |
| Botany | ½-1 |
| Biology | 1 |
| Chemistry | 1 |
| General Science | ½-1 |
| Geography | ½-1 |
| Physics | 1 |
| Physiology | ½ |
| Zoology | ½-1 |

## Group B

| | |
|---|---|
| Agriculture | 1-4 |
| Bookkeeping | ½-2 |
| Commercial law | ½ |
| Commercial arithmetic | ½ |
| Commercial geography | ½ |
| If taken in the junior or senior year | Business organization ½ Office practice ½ Salesmanship |
| Shorthand | 2 |
| Typewriting (only ½ unit if not combined with shorthand) | ½-1 |
| Domestic art | 1-2 |
| Domestic science | 1-2 |
| Drawing, art, and design | 1-4 |
| Mechanical drawing | 1-4 |
| Shop work | 1-2 |
| Shop work and drawing | 1-4 |
| Music | 1-4 |
| History and appreciation | 1 |
| Theory and harmony* | 2 |
| Choral music | ½-1 |
| Orchestra | ½-2 |
| Band | ½-2 |
| Applied music | ½-2 |
| Optional (not including drill subjects such as penmanship, physical education, or military training) | ½-1 |

*Not less than 2 units accepted.



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

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.

## Admission Upon Examination

Applicants who have not been graduated from a secondary school may be admitted to the University upon passing entrance examinations in the required number and kinds of units as specified above. The dates of the regular entrance examinations are listed in the calendar on the front cover.

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.

## Admission on the Adult Special Basis

Citizens of Wisconsin, 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 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.

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 Asst. Dean I. L. Baldwin before September first if possible. A satisfactory scholastic record and honorable dismissal are required.

## Freshman Period

All freshmen are required to be present at the University on the Wednesday preceding the beginning of instruction in September 1933 and to remain throughout the week. This period (September 13 to 19) will be devoted to registration, conferences with advisers, physical examinations, aptitude tests, special educational examinations, assignments to classes, lectures and discussions on subjects of importance to new students, and a general introduction to university life.

Because attendance throughout the entire period is required, it is essential that all details connected with admission be attended to as early as possible. Students who graduate from high schools or academies in June should inform their principals sometime in May or early June of their intention to attend the University in the fall, so that the necessary certificates may be prepared and other important data furnished to university authorities.

Rooms for the semester should be secured in advance of Freshman Period so that there will be no confusion, uncertainty, or waste of time during the days when attention should be centered on "getting started."

## 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 about $2 a week for each student. Board in clubs, private families, and cafeterias ranges from $5 to $7 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 $21.50 a semester is charged each student. This includes a fee for medical attention, as explained on page 9. Nonresidents 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 |
| Physics 61 | 7.00 |
| Botany 1 | 5.00 |
| Zoology 3 | 5.00 |
| Botany 146 | 5.00 |
| Physiology 3 | 3.00 |

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.

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 $25, and incidental fee of $21.50 each semester and also may have a military uniform deposit of $10 for the first semester.

## Financial Help for Students

The University has made provisions 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, 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 Asssitant Dean I. L. Baldwin.

FRESHMAN SCHOLARSHIPS. Five scholarships of $100 each will be awarded to freshmen in the Agricultural courses who are residents of Wisconsin. An essay on an assigned topic must be presented together with certain references, before August 15, 1933. For further information write Assistant Dean I. L. Baldwin, 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 I. L. Baldwin during the second semester and before March 1.

GRADUATE FELLOWSHIPS AND SCHOLARSHIPS. Twelve fellowships and two scholarships are offered graduate students in this college. The fellowships carry a payment of $600 cash for the year in addition to a remission of the non-resident fees of $200 for students who live in other states, and the scholarships carry $250 a year with the remission of non-resident fees to students from other states.

There are also three all-university fellowships and two special scholarships for which our graduate students may compete with other graduate students of the University.

These are granted to those applicants who are best fitted for the work selected. Application for these honors is made to the Dean of the Graduate School on proper forms before February 15.

## 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.

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.

The 4-H Club is an organization composed of students who have carried the 4-H Club work before coming to college.

The Agricultural Student Council with representation from each of the Agricultural and Home Economics student organizations serves to coordinate all of the student activities.

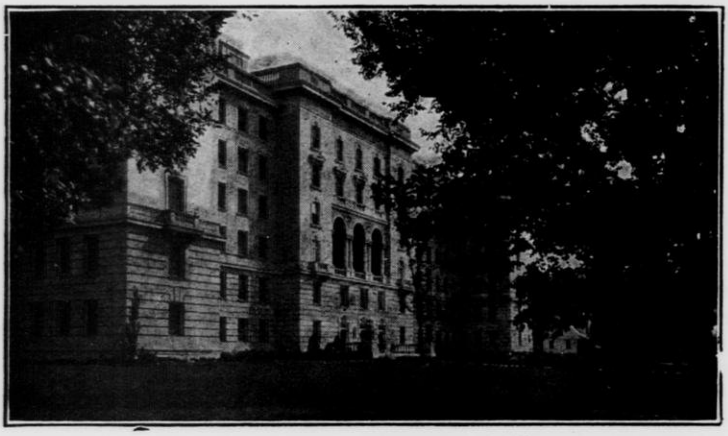
## Student Health

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, ears, 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.

## 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 HONRS 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 1932 the following Long Course students were awarded Sophomore Honors:

Arthur Wilson Dewey
Joseph Sherburne Elfner
Harold Frank Fick
John Roberts Harrower
Wenzel Koula
Charles Maxwell Lingley
Bruce Jack Longley
Stanley James Otis
Fred Christopher Wagner

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. They are awarded on the same basis as sophomore honors and sophomore high honors.

The following were granted at Commencement in June, 1932.

*High Honors*

Robert John Muckenhirn
Forrest Ward Quackenbush

*Honors*

Melvin Hazelton Doner
Robert Francis Fuelleman
Olaf Frederick Larson
Wilbur Nicholas Renk
Max Otto Schultze

## The Long Course in Agriculture

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 are 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.

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.

The curriculum contains the required subjects taken by all students in agriculture. The first two years are foundational and consist of 29 credits in the College of Letters & Science, 25 credits in specified courses in the College of Agriculture and 9 to 13 credits in selective courses dependent on the students interests and probable major. Part of the elective work of the sophomore year is dependent on choice of major.

Students should select a major at the middle

of the sophomore year to insure sufficient time to secure all requirements for the major.

The major consists of a minimum of 15 elective credits in a department. Not more than 5 credits in certain courses outside the given department may be substituted for an equivalent number of credits within the major department if reported in advance to the faculty. In case a student is interested in a line of endeavor involving more than one department, he may select as a major study a minimum of 25 elective credits of suitably related work in two or more departments. In the latter case the program must have the approval of the Executive Committee not later than the middle of the junior year. In either of the above cases, not more than 25 elective credits in any one department may count toward graduation.

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

A minimum of 20 elective credits must be taken outside the College of Agriculture, preferably during the junior and senior years.

Each student shall complete a minimum of 50 credits in the College of Agriculture, including required agricultural courses, options, majors and electives. Courses taken outside the College as a part of the major do not count as a portion of the 50 credit requirement. Courses taught in departments outside the College of Agriculture even though listed in departments of the College of Agriculture do not count as part of the 50 required credits in the College of Agriculture. Courses given by staff members of the Forest Products Laboratory, approved by the Faculty of the College of Agriculture, shall be counted as agriculture.

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.

A student who does not earn at least one grade-point per credit during the last two semesters of his attendance at the University will not be recommended for a degree with his class.

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

A system of grade points is in operation for all students in the University of Wisconsin. Graduation from the Long Course in Agriculture requires 133 credits and 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 ACTIVITY REQUIREMENT. Every freshman is required to take three hours a week in either physical education, military science or band instruction for a total of four semesters. The student shall express his choice between these alternatives when filling out his semester election card. Students who elect Military Drill must carry the work for two years. 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 partially returned when the equipment is returned, subject to regulations of the military department.

Alpha Zeta. The honorary agricultural fraternity. Juniors and Seniors are elected to membership on the basis of scholarship.

For the completion of the basic course in Military Science a total of four scholastic credits will be awarded. For the completion of the advanced course in Military Science a total of eight credits will be awarded. Each two-year period shall be regarded as a unit and credits shall be granted only upon the completion of each one of these units. The appropriate number of credits are to be entered each semester as provisional until the course, basic or advanced as the case may be, has been completed. Grade points are to be awarded for the credits earned in Military Science as for other scholastic work.

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 except those who enter with one semester of work completed in some other collegiate institution or enter this college the second semester and complete that semester of work. Students who have been permitted to defer Convocation by the Executive Committee must present one additional credit for graduation.

## Plan of Course

### FRESHMAN YEAR

| First Semester | Credits | Second Semester | Credits |
|---|---|---|---|
| Engl. 1a—Freshman composition | 3 | Engl. 1b—Freshman composition | 3 |
| Chem. 1a—General chemistry | 5 | Chem. 1b—Qualitative analysis | 5 |
| Math. 71, 1 or 51 | 4 | Botany 1—General botany | 5 |
| An. Husb. 1—Livestock production | 3 | Agron. 1—General farm crops | 3 |
| or Agron. 1—General farm crops | (3) | or | |
| Convocation | 0 | An. Husb. 1—Livestock production | (3) |
| Physical activity requirement | 0 | Physical activity requirement | 0 |
| | 15 | | 16 |

Students will elect their animal husbandry or agronomy in the first semester and the alternative subject in the second semester. Students who are certain they wish to continue mathematics beyond the required course should elect Mathematics 1; students who are to major in Agricultural Engineering should choose Mathematics 51; and those who carry Mathematics 71 with success will be permitted to take Mathematics 2 if they wish to continue training in mathematics. Majors in the technical agricultural engineering course may substitute Mechanics 3 for Botany 1. Majors in Landscape Gardening may substitute Art Education 50 for Animal Husbandry 1 and Topographical Engineering 108 for Mathematics 71, 1 or 51.

### SOPHOMORE YEAR

| First Semester | | Second Semester | |
|---|---|---|---|
| Agr. Bact. 1—General survey | 4 | Agr. Econ. 1—Prin. of Agr. Economics | 3 |
| Soils 1—Soil fertility | 5 | Agr. Chem. 1 and 2—Agr. Chem. and analysis | 5 |
| Econ. 1a—General economics | 4 | Agricultural option | 3 |
| Agricultural option | 3 | Botany 146, Physiology 3 or substitute | 4 |
| Electives | 0-7 | Electives | 1-8 |
| | 16-18 | | 16-18 |

Students majoring in the following departments will take the following subjects instead of Botany 146 or Physiology 3:

Agricultural Economics, Dairy Husbandry—Economics 1b.

Agricultural Journalism—Rural Sociology 25.

Agricultural Engineering—Advanced mathematics.

Agricultural Education—Three credits in the Department of Education.

Rural Sociology—Sociology 1 or 2.

## Agricultural Options

Freshmen in the Middle Course and sophomores in the Long Course must choose two courses from the following group. Only one subject in a given department can be counted as an option in meeting this requirement, but subjects not chosen as options may later be taken as electives.

Agr, Engr. 1—Land surveying and drainage .....3
Hort. 1—Principles of fruit growing .....3
Poultry 1—Poultry raising .....3
Vet. Sci. 1—The animal body .....3
Dairy 1—Introduction to dairying .....3
Hort. 3—Vegetable gardening .....3
Econ. Ent. 1—Farm insects .....3
Agr. Engr. 5—Farm field machinery .....3

## Preparation For Specific Objectives

AT THE Wisconsin College of Agriculture we have a single curriculum of minimum requirements and the student selects with the advice of the major professor, the subjects which point to a major objective. Such objectives may be preparation as a high school teacher of agriculture, marketing adviser, county agricultural agent, agricultural chemist along plant or animal lines, agricultural journalist, agricultural engineer, landscape designer, plant operator for dairy manufacturing, farming, or any one of over a hundred different types of positions in agriculture. The earlier the objective is determined the better the chances are for a well balanced training for the future.

The Wisconsin Curriculum has advantages over many others. Of the 133 credits required for graduation, 49 credits are required in the College of Letters and Science and 50 credits in the College of Agriculture. There are 35 credits of fundamental work that are chosen with few limitations according to the student's interest and 75 credits are electives of the major grouping or student's interest.

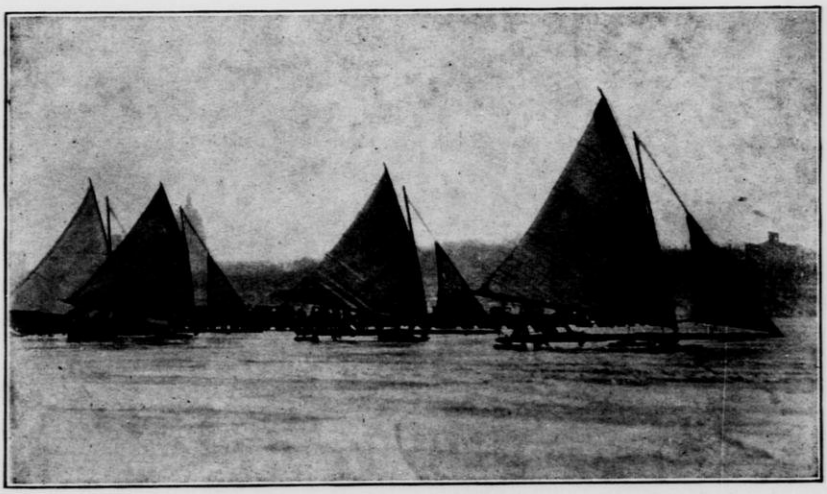
It is apparent that curricula cannot be printed for all objectives. However, a number of suggested groupings of courses which are planned to fit students for specific lines of work are available in mimeographed form.

In the field of agricultural industry and commerce outlines are available for the following: agricultural commerce, canning industry, meat and poultry products industries, dairy manufacturing industries, livestock feed industry, agricultural equipment industry, fertilizer industry, and seed industry.

Another outline is available for those who are interested in agricultural extension or vocational teaching.

In the fields of the agricultural arts and sciences each department is prepared to recommend grouping of suitable courses for a major. Mimeographed outlines are available for the following: agricultural chemist, agricultural engineer—technical, agricultural journalist, animal husbandry science major, dairy manufacturing major, economic entomologist, landscape design and construction major and soil chemist or physicist.

Many other groupings are possible and you are asked to write Assistant Dean Baldwin for the above outlines or other suggested groupings to meet your needs.



ICE BOATING IS POPULAR

# The Middle Course

*Leading to the Title of Graduate in Agriculture*

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.

The total requirements for graduation in the Middle Course are 64 credits and 64 grade-points. All Middle Course students are required to take convocation and one year of physical education or two years of military science, or band instruction.

A maximum of ten elective credits may be taken outside the College of Agriculture. Subjects of the Long Course taken in the College of Letters and Science and not required in the Middle Course are considered electives outside the College of Agriculture.

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.

This course gives the maximum opportunity for choosing work for a vocational objective. Students should have an objective in mind when entering the course and plan their work so prerequisites may be taken for all courses desired. Early in the first semester the Assistant Dean should be consulted concerning objectives and future courses desired. Dairy manufacturing, poultry, animal husbandry, horticulture, or farm crops are usual fields of specialization, but others may be made.

## FRESHMAN YEAR

### First Semester

| | Credits |
|---|---|
| Engl. 1a—Freshman composition | 3 |
| Chemistry 1a—General chemistry | 5 |
| Electives | 6 |
| Convocation | 0 |
| Physical activity requirement | 0 |
| | 14 |

### Second Semester

| | Credits |
|---|---|
| English 1b—Freshman composition | 3 |
| Chem. 1b—Qualitative analysis | 5 |
| Electives | 8 |
| Physical activity requirement | 0 |
| | 16 |

In the Sophomore year 16-18 credits of elective work must be carried each semester.

## 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*
IRA LAWRENCE BALDWIN, Ph.D., *Professor of Agricultural Bacteriology*
EDWIN BROUN FRED, Ph.D., *Professor of Agricultural Bacteriology*
WILLIAM DODGE FROST, Ph.D., D.P.H. *Professor of Agricultural Bacteriology*
ELIZABETH MCCOY, Ph.D., *Assistant Professor of Agricultural Bacteriology*
WILLIAM BOWEN SARLES, Ph.D., *Assistant Professor of Agricultural Bacteriology*
MILDRED A. ENGELBRECHT, M.S., *Instructor in Agricultural Bacteriology*
HARRY EDWIN SAGEN, Ph.D., *Instructor in Agricultural Bacteriology*
PERRY WILLIAM WILSON, Ph.D., *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; 4 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. Sarles.

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. Wilson.

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, Miss Engelbrecht.

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, Mr. Sagen.

123. SOIL BACTERIOLOGY. I; 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.

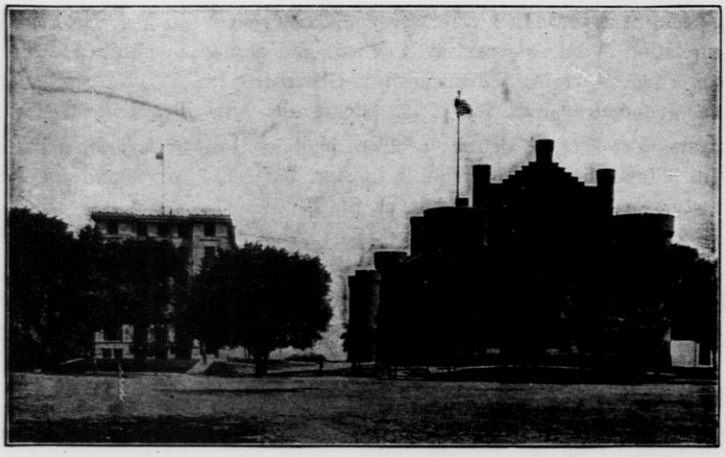
125. FOOD BACTERIOLOGY. I; 3 cr. The microbiology of foods and of industrial fermentations. Prerequisite: Agr. Bact. 1, 2 or 4 or Medical Bacteriology 102. Lab. fee $4.50. Miss McCoy.

126. PHYSIOLOGY OF BACTERIA. II; 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.

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, Miss Engelbrecht.

200. RESEARCH. Yr; 2-5 cr. A detailed study of a definite problem in the field of agricultural bacteriology. Prerequisites: Agr. Bact. 121, 123, 124, 125, 126, 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.



THE "Y" AND "GYM"
These are among the first buildings that the new student learns to know.

# AGRICULTURAL CHEMISTRY

EDWIN BRET HART, B.S., *Professor of Agricultural Chemistry, Chairman*
KARL PAUL LINK, Ph.D., *Professor of Bio-Chemistry*
WILLIAM HAROLD PETERSON, Ph.D., *Professor of Agricultural Chemistry*
HARRY STEENBOCK, Ph.D., *Professor of Agricultural Chemistry*
CONRAD ARNOLD ELVEHJEM, Ph.D., *Associate Professor of Agricultural Chemistry*
WILLIAM EDWARD TOTTINGHAM, Ph.D., *Associate Professor of Agricultural Chemistry*
BLANCHE MARYE RIISING, M.S., *Instructor in Agricultural Chemistry*

The courses offered in this department are intended to give a broad view of biological 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. ELEMENTARY BIOCHEMISTRY. II; 3 cr. Introduction to the chemistry of living matter. A general discussion of the composition, the nutritional requirements, and the metabolism of plants and animals. Prerequisite: Chemistry 1b or concurrent registration. Mr. Elvehjem.

2. ELEMENTARY BIOCHEMISTRY. Laboratory II; 2 cr. Qualitative and quantitative chemical analysis applied to agricultural materials. Prerequisite: Credit or concurrent registration in Agr. Chem. 1. Lab. fee $4.50. Mr. Elvehjem.

A CLASS IN AGRICULTURAL CHEMISTRY

Every opportunity is given the students to familiarize themselves with the science which has contributed to the present development of agriculture.

3. FOOD BIOCHEMISTRY. I; 4 cr. Lectures and laboratory work on the chemistry and metabolism of the essential food constituents; carbohydrates, fats, proteins, etc. Required of all home economics students. Prerequisite: Chemistry 1b. Lab. fee $4.50. Mr. Peterson.

100. THESIS. Yr; 2 cr. May be taken in plant, animal, fermentation, or dairy chemistry. Lab. fee $2.25 per lab. cr. Staff.

120. PLANT BIOCHEMISTRY. 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. 1; 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 BIOCHEMISTRY. I; 3 cr. The biochemistry of fats, lipoids, proteins, carbohydrates, enzymes, hormones, and other constituents of plant and animal tissues. Two lectures and one laboratory period. Prerequisites: quantitative and organic chemistry. Laboratory fee $2.25. Mr. Steenbock.

124. BIOCHEMICAL METHODS. I; 1-3 cr. A survey of important analytical processes used in the study of biochemical problems. Prerequisites: Chemistry 12, 120, and Agr. Chem. 120, 121 or 122. Lab. fee $2.25 per lab. cr. Mr. Elvehjem.

125. ANIMAL METABOLISM AND VITAMINS. II; 4 cr. Caloric relations; the chemistry of urine, blood, bone, and other tissues and vitamins, with feeding experiments on animals. Two lectures and two laboratory periods. Prerequisites: Agricultural chemistry 122 or its equivalent. Laboratory fee $4.50. 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 BIOCHEMISTRY. II; 2 cr. Lectures on the chemical composition of microorganisms and the mechanism of fermentation processes. Prerequisite: Agr. Bact. 1 or 2 desirable, Organic Chemistry 120, required. Mr. Peterson.

128. CARBOHYDRATE CHEMISTRY. I; 2 cr. Lectures on the structural and biochemical relationship of the simple sugars and sugar derivatives. II; 1 cr. The chemistry and biochemistry of the polysaccharides. Prerequisite: 1 year of Organic Chemistry or consent of instructor. Mr. Link.

200. RESEARCH. Yr. *cr. Carbohydrate and plant chemistry, Mr. Link. Plant nutrition and plant metabolism, Mr. Tottingham. Fermentation bio-chemistry, Mr. Peterson. Animal chemistry and animal nutrition, Mr. Hart, Mr. Steenbock, Mr. Elvehjem. Dairy chemistry, Mr. Hart. Lab. fee $2.25 per lab. cr.

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

ASHER HOBSON, Ph.D., *Professor of Agricultural Economics, Chairman*
CHRISTIAN LAURITHS CHRISTENSEN, B.S., *Professor of Agricultural Economics*
BENJAMIN HORACE HIBBARD, Ph.D., *Professor of Agricultural Economics*
PRESTON ESSEX MCNALL, Ph.D., *Professor of Agricultural Economics*
GEORGE SIMON WEHRWEIN, Ph.D., *Professor of Agricultural Economics*
HENRY HARRISON BAKKEN, M.A., *Associate Professor of Agricultural Economics*
RUDOLPH KNUGAARD FROKER, M.A., *Associate Professor of Agricultural Economics*
DON S. ANDERSON, B.S., *Assistant Professor of Agricultural Economics*
JOHN SWEET DONALD, B.S., D.D.S., *Assistant Professor of Agricultural Economics*
ISAAC FULTS HALL, Ph.D., *Assistant Professor of Agricultural Economics*
AUSTIN CLAIR HOFFMAN, M.S., *Assistant Professor of Agricultural Economics*
WILLIAM PETER MORTENSON, Ph.D., *Assistant Professor of Agricultural Economics*
MARVIN ARNOLD SCHAARS, Ph.D., *Assistant Professor of Agricultural Economics*
DONALD RICHARDS MITCHELL, M.S., *Instructor in Agricultural Economics*
CARL FREDERICK WEHRWEIN, Ph.D., *Instructor in Agricultural Economics*
MILES CHARLES RILEY, LL.B., *Lecturer in Agricultural Economics*
WALTER AUGUSTUS ROWLANDS, B.S., *Extension Specialist in Land 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 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.

Students are advised to take Economics 1a and 1b, Agricultural Economics 1 and 8 in the Sophomore year; Agricultural Economics 14, 117, 128, 155 and 179 in the Junior year; and Agricultural Economics 10, 107, 126, 127 and 152 in the Senior year. This sequence gives the desired background for graduate work.

SEMINARY GROUP IN AGRICULTURAL ECONOMICS
Problems of cooperation, marketing, farm management, farm credits and land tenure are of greatest importance to the nation.

A curriculum in Agricultural Commerce gives a background in agricultural science as well as a training in economics and business practice.

1. PRINCIPLES OF AGRICULTURAL ECONOMICS. II; 3 cr. Application of economics to agriculture. Required of all agricultural students. Prerequisite: Economics 1a. Mr. Hibbard.

8. FARM RECORDS AND ACCOUNTS. I; 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. Prerequisite: Junior standing. Mr. Mitchell.

14. FARM BUSINESS AND LEGAL PRACTICE. II; 3 cr. Mr. Riley.

100. THESIS. Yr; 2 cr. Staff.

107. ADVANCED FARM MANAGEMENT. II; 2 cr. Diminishing returns, proportioning of factors and farm management; problems of joint costs and comparative advantage in relation to farm production; farm adjustments and the price system. Prerequisite: Agricultural Economics 10 or equivalent. Mr. McNall.

117. OUTLINES OF LAND ECONOMICS. I; 3 cr. Principles underlying land classification, characteristics, relation to population and policies. Prerequisite: Economics 1a. Mr. Wehrwein.

124. RURAL-REGIONAL PLANNING. II; 2-3 cr. A seminary approach to the field of rural-regional planning. Analysis of actual case studies of land classification, land utilization, and rural ecology as these apply to the creation of rural development plans and zoning ordinances for any given region. The extra credit is based upon topical and drafting room work. Prerequisites: Graduate standing or seniors with consent of instructors. Mr. Aust, Mr. Kolb, Mr. Wehrwein.

126. INTERNATIONAL TRADE IN AGRICULTURAL PRODUCTS. I; 3 cr. Review of theories of international trade and foreign exchange; history of foreign trade in agricultural products; analysis of agricultural imports and exports; agricultural price supporting measures; current international trade problems in their relation to American agriculture. Prerequisite: Economics 1a. Mr. Schaars.

127. COOPERATIVE MARKETING. II; 3 cr. An analysis of marketing organizations, methods and theory underlying cooperative and private enterprises. Current agricultural marketing problems together with a consideration of the economic, legal and social aspects of cooperative marketing. Governmental relations and selected phases of the cooperative movement will be considered. Prerequisite: a course in marketing or concurrent registration. Mr. Bakken.

128. MARKETING AGRICULTURAL PRODUCTS. I; 3 cr. Development of agricultural marketing; services, agencies, methods; emphasis on principles and practices; price factors; commodity exchanges; current marketing problems; governmental relations; marketing costs. Prerequisite: Economics 1a. Mr. Schaars.

129. COOPERATIVE MANAGEMENT PROBLEMS. II; 2 cr. A consideration of the business structure of cooperative associations engaged in commercial activities; problems involving membership relations, pooling, financing, internal control, directors' responsibilities, trade and sales practice, and administrative policies. Prerequisite: Agr. Economics 127 or consent of instructor. Mr. Hobson.

152. FARMER MOVEMENTS. I; 2 cr. History of the efforts of farmers to better their economic condition by forming general, even nation-wide, organizations designed

to control markets and influence legislation in the interest of fairness. Prerequisite: Agr. Econ. 1 or consent of instructor. Mr. Hibbard.

155. PRICES OF AGRICULTURAL PRODUCTS. II; 3 cr. An analysis and interpretation of the factors affecting the prices of agricultural products, together with a study of price movements, trends, cycles and minor fluctuations. The interrelationship of price, demand and supply of various types of agricultural products. Attention given to the interpretation of materials contained in public and private outlook reports. Prerequisite: Agricultural Economics 1. Mr. Mortenson.

179. URBAN LAND ECONOMICS. II; 3 cr. Urbanization, localization, and structure of cities, urban land utilization, home ownership and tenancy, housing and credit, zoning, city and regional planning. Prerequisite: Economics 1b. Mr. Wehrwein.

180. TOPICAL WORK. Yr; *cr. Staff.

200. RESEARCH. Yr; *cr. Cooperation and marketing, Mr. Bakken and 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. Farmer movements, taxation and farm credit, Mr. Hibbard. Land economics and land problems, Mr. Wehrwein. Agricultural prices and statistics, Mr. Mortenson. International Agricultural Relations, Mr. Hobson.

221. LAND INCOME. II; 3 cr. The characteristics of land as a factor of production, spatial element of land, economics of land utilization, theories of rent, principles of land valuation and taxation. Prerequisite: graduate standing. Mr. Wehrwein.

226. SEMINARY: LAND PROBLEMS. Yr; 2 cr. Land tenure and utilization in the principal countries studied in a two year cycle; the new countries including the United States (1932-33); the countries with a feudal heritage (1933-34). Prerequisite: Agricultural Economics 117, 229 or concurrent registration. Mr. Hibbard, Mr. Wehrwein.

228. SEMINARY: THEORY OF MARKETS AND MARKETING. II; 2 cr. A study of the historical development of markets from early continental fairs; the practices and customs of auctions, clearing houses, exchanges, and boards of trade; the emergence of modern sales agencies operating under cooperative, private, and governmental initiative. Prerequisite: graduate standing. (Given in 1932-33 and in alternate years). Mr. Bakken.

229. ADVANCED AGRICULTURAL ECONOMICS. Yr; 2 cr. The field of agricultural economics with respect to its origin and the main issues around which the thinking of those interested in agriculture revolves. Prerequisite: graduate standing. Mr. Hibbard.

252. SEMINARY: INTERNATIONAL AGRICULTURAL RELATIONS. II; 2 cr. An examination of international agricultural organizations and institutions, and their activities, together with an analysis of national agricultural measures and their influences in the international sphere. Prerequisite: Graduate standing or consent of instructor. Mr. Hobson.

255. SEMINARY PRICE ANALYSIS. II; 3 cr. The application of statistical methods involved in isolating and analyzing agricultural price problems. Stress will be placed on proper interpretations. Prerequisite: Economics 130 or equivalent. Mr. Mortenson.

# AGRICULTURAL EDUCATION

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

Students in the College of Agriculture who wish to prepare for the teaching of agriculture in secondary schools must complete a major and certain elective courses in animal husbandry, poultry, dairying, agronomy, horticulture, soils, agricultural engineering, agricultural economics, and agricultural journalism as a background of agriculture and also 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 in the College of Agriculture but preferably in Agricultural Education where twelve of the credits for the Teachers' Certificate are a portion of the major, thus allowing for greater choice of electives.

Students completing the requirements for graduation in Agriculture as suggested above and qualifying for a University Teachers' Certificate will receive the degree Bachelor of Science (Agriculture and Education) and a license to teach issued by the State Superintendent of Public Instruction. Such students must (a) register for the certificate in the School of Education at the beginning of the junior year, (b) receive the recommendation of the teacher training committee of the College of Agriculture, (c) complete 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. 128—Program building in vocational agriculture | 2 |
| Agr. Educ. 50—Teaching of agriculture | 3 |

Students beginning work for a certificate may arrange their courses most satisfactorily by starting 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. Each senior spends a week in a high school vocational agricultural department each semester. Students should secure a list of 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 50) | 3 |
| Agricultural Education 128 | 2 |

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

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 the School of Education 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. II; 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 (Rural Sociology 25). I; 3 cr. Counts as part of agricultural education major. Mr. Kolb.

50. 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.

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, Mr. Kivlin.

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 organizations. Open only to seniors and graduate students. Mr. Clark.

128. PROGRAM BUILDING IN VOCATIONAL AGRICULTURE. I, 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. James.

142S. ADMINISTRATION AND SUPERVISION ON EXTENSION. Summer Session, 2 cr. Mr. Clark.

175S. ORGANIZATION AND PLANNING OF EXTENSION. Summer Session, 2 cr. 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.

STUDENTS ENJOY WATER SPORTS

# AGRICULTURAL ENGINEERING

EDWARD RICHARD JONES, M.S., *Professor of Agricultural Engineering, Chairman*
FLOYD WALDO DUFFEE, B.S., *Professor of Agricultural Engineering*
OTTO REINHART ZEASMAN, B.S., *Associate Professor of Soils and Agricultural Engineering*
FRED BENJAMIN TRENK, M.S., *Instructor in Forestry*
MILON GEORGE HUBER, B.S., *Instructor in Agricultural Engineering.*
STANLEY ARTHUR WITZEL, C.E., *Instructor in Agricultural Engineering*

The undergraduate courses in this department are service courses for students majoring in other departments, as well as the basis for advanced work of majors in agricultural engineering, both the non-technical and the technical.

The laboratories are well-equipped with farm machinery, engines and tractors for the study of general mechanical principles. Some of the laboratory work is given in the fields of the University farms. The University Marsh of 100 acres of tile-drained land is an excellent drainage laboratory.

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 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 major in non-technical agricultural engineering 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 fields of 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. In addition to the required courses in the College of Agriculture the student takes Mathematics 52, 54, and 55; Drawing 1, 2, and 3; Physics

STUDENTS ASSIST IN DYNAMOMETER TESTS

51 and 52; and Mechanics 1, 2, and 3, using the latter as a substitute for Botany 1. Graduating from agriculture at the end of four years, it is possible for these men to finish the course in civil, mechanical, or electrical engineering with two semesters of additional work. This gives them thorough training in pure engineering, which, in addition to an agricultural background, is so essential to professional agricultural engineers. This training fits them for valuable service in developing the rural branches of utility companies; in the design and manufacture of farm machinery; the development of modern dairy product factories, canning factories, and refrigeration plants; and in the construction of farm buildings that harmonize with the times. A circular on technical agricultural engineering will be sent on request.

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 either the junior or senior years they take Agricultural Engineering 121.

1. LAND DRAINAGE. I; 3 cr. Subdivision of land, leveling, chaining, plane table mapping, contours and profiles. Principles, practices and economics of land drainage, irrigation and erosion control. Design of drainage systems, computation of gradients, tile testing, and water measurement. Engineering students previously trained in topographic surveying substitute additional field work on farms around Madison. Optional subject for all agricultural students. Lab. fee $2.25. Mr. Jones.

2. FARM STRUCTURES. I; 3 cr. Requirements of farm buildings and their economical design, including the house, animal and machinery shelter, feed and vegetable storage, and other farm structures. Wall insulation, heating, lighting and ventilation. Water supply, sewage disposal and concrete construction. Lab. fee $2.25. Mr. Jones.

3. GAS ENGINES. I; 3 cr. Construction and operation of gasoline engines; farm electric light plants and electric motors; power transmission. It is desirable to have this course preceded by Shop 2. Lab. fee $4.50. Mr. Duffee.

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.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Staff.

101. DRAINAGE DESIGN. II; 2 cr. (formerly numbered 102) 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 erosion control or irrigation. Field work and conferences by appointment. Prerequisite: Agr. Engr. 1 or Top. Engr. 1 and 2. Mr. Jones.

103. FARM TRACTORS. II; 3 cr. (formerly numbered 101) Laboratory tests of gas engines and field practice with farm tractors. Prerequisite: Agr. Engr. 3. Lab. fee $4.50. Mr. Duffee.

105. BELT AND TRACTOR MACHINERY. II; 2 cr. Threshers, silo fillers, and other belt-driven farm machines, large and small; tractor plow; machinery calibration tests. Lectures, laboratory studies, and field demonstrations. Prerequisites:

Agr. Engr. 5 and 103 or concurrent registration. Offered 1933-34 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.

180. SPECIAL PROBLEMS. I and II; *cr. Open to technical majors who have had prerequisite training for advanced work in farm machinery, farm power, farm structures, land clearing, drainage or forestry. Lab. fee $2.25 per lab. cr. Mr. Jones, Mr. Duffee, Mr. Witzel.

200. RESEARCH. Yr; *cr. Agricultural Engineering problems for students qualifying for advanced degrees. Lab. fee $2.25 per lab. cr. Mr. Jones, Mr Duffee, Mr Witzel.

## 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. Schumann, Mr. Peters.

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. GENERAL FORESTRY. I; 2 cr. An outdoor study of trees and their identification. Lectures on the natural forest conditions and the development of forest policy in the United States and elsewhere. No Prerequisite. Mr. Tiemann.

102. WOOD TECHNOLOGY. II; 2 cr. Open to all students. Microscopic structure of wood, and its formation by the living tree. Distinction between species. Its properties, uses and products. No prerequisite. Mr. Tiemann.

GOING TO THE MARSH
Practical work in drainage is done by students in the course, Agricultural Engineering 1.

# AGRICULTURAL JOURNALISM

ANDREW WINKLE HOPKINS, B.L., *Professor of Agricultural Journalism, Chairman*
WILLIAM ALLISON SUMNER, M.Ph., *Associate Professor of Agricultural Journalism*
KENNETH GAPEN, B.S., *Assistant in Agricultural Journalism.*

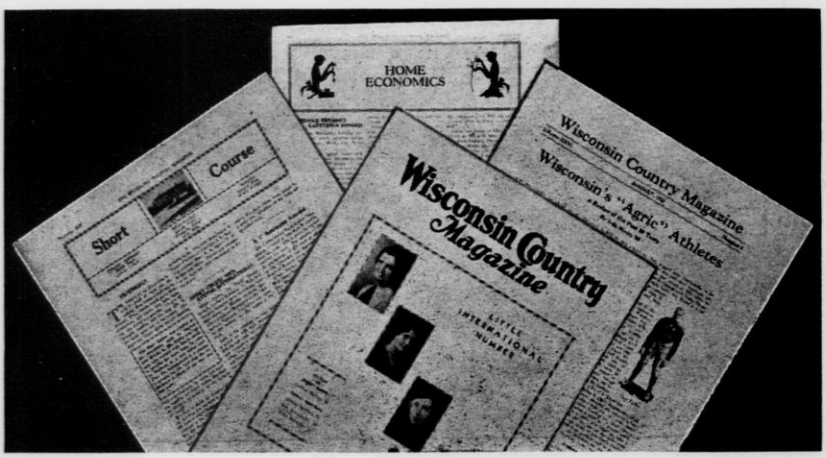
Agriculture must be made more articulate. To render the greatest service the technically trained worker must use the printed page. The ability to write simply and understandably is invaluable to the teacher, the extension worker, and the farmer.

Selling and advertising are important in the neglected half of farming—the business side. More and more farmers are coming to appreciate the need for 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 and 103 are advised.

Majors in the department will be expected to take Agricultural Journalism 1, 2, 3, 100, 103, 111 and 150. Courses in the Department of Journalism in the College of Letters and Science should be taken in addition 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; and Journalism 7, Community newspaper.

Home Economics students majoring in the department will be expected to take Agricultural Journalism 8, 103, 106, 111, and 150. Courses 2, newspaper report-




"THE COUNTRY MAGAZINE"
This student publication offers practical training.

ing; 3, copy reading; and 123, women's departments in newspapers and magazines, in the School of Journalism should be taken and count toward the major.

1. WRITING FARM NEWS. I; 3 cr. An elementary course to help students who expect to write farm news articles for publication in the weekly or daily papers or the various farm papers. 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. II; 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 major in home economics journalism. Mr. Sumner.

100. THESIS. Yr; 2 cr. Original studies of a journalistic or advertising nature. Practical problems are investigated. Mr. Hopkins, Mr. Sumner.

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.

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.

180. METHODS AND PROBLEMS. I, II; *cr. Mr. Hopkins, Mr. Gapen.

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 seed grower may be studied. Prerequisite: Agr. Journ. 1, 3, or 8. Mr. Hopkins, Mr. Sumner.

# AGRONOMY

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

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 117, Structure of economic plants; and Botany 129, Classification of cultivated plants.

1. PRINCIPLES AND PRACTICES IN CROP PRODUCTION. I, II; 3 cr. Includes a study of farm crop seeds, growth requirements, crop varieties and types, botanical relations, adaptations, cultural practices, crop improvement 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.

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.

THE NEW AGRONOMY BUILDING

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.

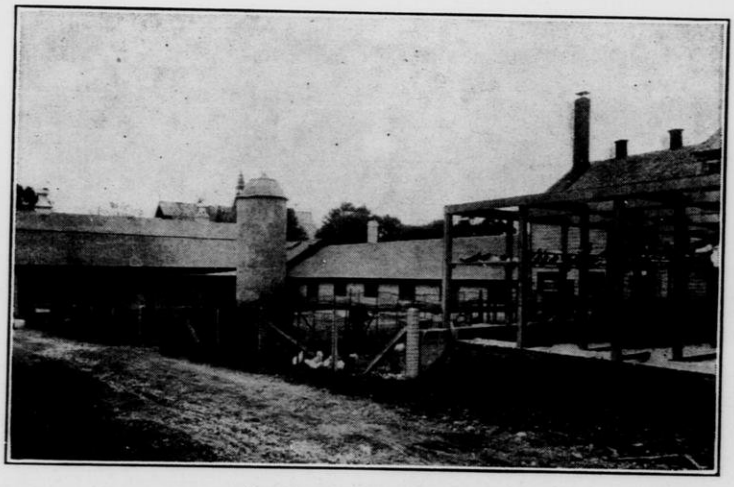
121. GRAIN PRODUCTION AND CROP JUDGING. I; 3 cr. Varieties, uses, distribution, and approved practices in growing, together with judging competitive farm crop displays. A one day trip to Milwaukee to visit the Board of Trade and the cereal industries. Prerequisite: Agronomy 1. Lab. fee $4.50. Mr. Leith, Mr. Holden.

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. Mr. Wright.



THE GENETICS BARNS
Experiments in animal breeding are conducted here.

# 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*
JAMES JEROME LACEY, B.S., *Assistant Professor of Animal Husbandry*
ISAAC WALKER RUPEL, Ph.D., *Assistant Professor of Animal Husbandry*
ARTHUR OWEN COLLENTINE, B.S., *Instructor in Animal Husbandry*
ALBERT JULIUS CRAMER, B.S., *Instructor in Animal Husbandry*
ROY THEODORE HARRIS, *Instructor in Animal Husbandry*
BENJAMIN HAMILTON ROCHE, M.S., *Instructor in Animal Husbandry*
PAUL EUGENE NEWMAN, B.S., *Assistant 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 as farm managers or herdsmen, or who intend to qualify as vocational agricultural teachers or county agricultural agents. Students taking this major should elect Agricultural Chemistry 1 and 2 and Physiology 3, Animal physiology, in their sophomore year. In the junior and senior years they should elect animal husbandry courses in feeding, judging, breeding and production. Students who wish to qualify for a teacher's certificate should elect teachers' courses not later than the beginning of the junior year. Agricultural Journalism 3, Advertising; Agricultural Economics 10, Farm Organization and Management; Dairy Husbandry 5, City milk supply; and Agricultural Bacteriology 121, Dairy bacteriology; and practical courses in other departments are suggested.

An Animal Science course has been planned for men desiring to go into college or experiment station work and is suggested for those intending to do vocational agricultural teaching, county agricultural work, or work in various commercial or educational positions.

Not to exceed five credits from the following courses may be counted as a portion of the major requirements in animal husbandry: Agricultural Chemistry 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 cr. Mr. Humphrey and staff.

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 1933-34.

130. SWINE PRODUCTION. I; 3 cr. History of the hog industry in America; systems and costs of production and marketing; pedigree work and registration;

and the breeding, feeding and management of breeding and market hogs. Prerequisites: An. Husb. 1. Lab. fee $2.25. 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 one day tour to visit leading pure-bred herds, dairy equipment plants, and farms producing certified milk is conducted; the cost is from $4 to $5. Prerequisite: An. Husb. 1. Lab. fee $4.50. Mr. Rupel.

135. SEMINARY ANIMAL HUSBANDRY. 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.

180. SPECIAL PROBLEMS. Yr; *cr. Special problems on feeding, management, or breeding of livestock, including laboratory, library, or field work with conferences and reports. In the second semester special work in judging livestock is given as well. These problems will be assigned by respective members of the staff. Consent of instructor required. Lab. fee $2.25 per lab. cr. Staff.

200. RESEARCH. Yr; *cr. A detailed study of a definite research problem in animal husbandry. Conference on experimental methods. Mr. Bohstedt and staff.

STUDENT JUDGES AT THE INTERNATIONAL
Each year a group of our students takes part in the collegiate judging contest at Chicago.

# DAIRY INDUSTRY

EDWARD HOLYOKE FARRINGTON, M.S., *Professor of Dairy Industry, Emeritus*
HOWARD CAMPBELL JACKSON, Ph.D., *Professor of Dairy Industry, Chairman*
WALTER VAN PRICE, Ph.D., *Professor of Dairy Industry*
HUGO HENRY SOMMER, Ph.D., *Professor of Dairy Industry*
JOHN LANGLEY SAMMIS, Ph.D., *Associate Professor of Dairy Industry*
LOUIS CHARLES THOMSEN, B.S., *Assistant Professor of Dairy Industry*
CHARLES ALFRED BUCK, B.S., *Instructor in Dairy Industry*
HANS TJELLESEN SONDERGAARD, *Instructor in Dairy Industry*

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 elect Physics 61, 5 cr., Chemistry 20 or 120, 5 cr., Agricultural Chemistry 1 and 2, 5 cr., and Dairy Industry 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 Industry 103, 105, and 108, 3 cr. each, Dairy Industry 104, 4 cr. and Dairy Industry 123, 2 cr. should be taken in the senior year as a minimum.

Dairy Industry 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.

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.

103. CREAMERY OPERATION AND MANAGEMENT. I; 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 $4.50. Mr. Jackson, Mr. Thomsen.

104. CHEESE FACTORY OPERATION AND MANAGEMENT. II; 4 cr. A combined lecture and laboratory course to study the manufacture of cheese. Several types of cheese are 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.

105. MARKET MILK. I; 3 cr. The production and commercial handling, processing, and distribution of market milk and related products. Quality factors and de-

fects in these products. Milk ordinances and board of health regulations. Lab. fee $4.50. Mr. Sommer.

106. Ice Cream and Condensed Milk Products. II; 3 cr. The theory and practice of ice cream making. The manufacture of milk powder, malted milk, condensed milk, and evaporated milk. Quality factors and defects in these products. Offered in 1934-35 and in alternate years. Lab. fee $4.50. Mr. Sommer.

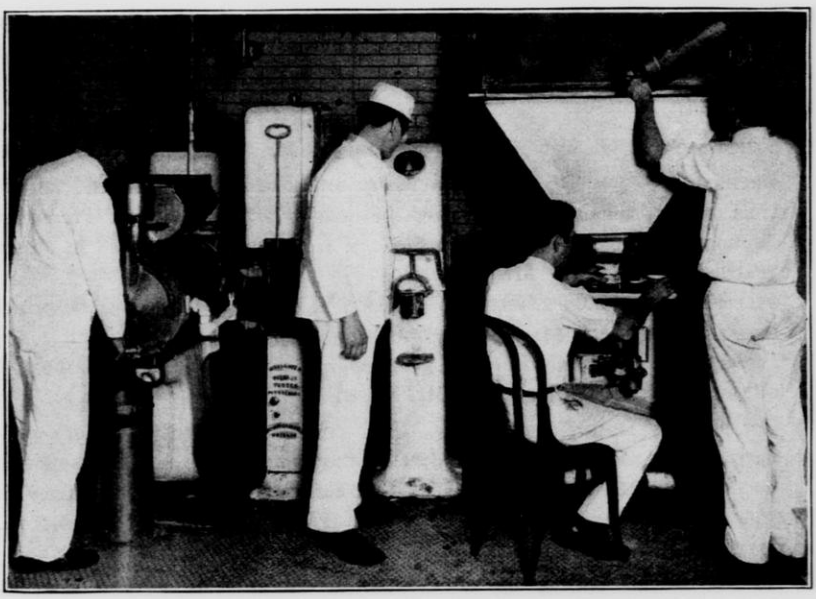
108. Dairy Mechanics. II; 3 cr. Dairy plant construction, heating, ventilation, sewage disposal, refrigeration, installation, testing, and operation of dairy machinery. A two day field trip to well known dairy plant is usually included in the course. Lab. fee $2.25. Mr. Thomsen.

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 1933-34 and in alternate years. Lab. fee $4.50. Mr. Sommer.

180. Advanced Dairy Manufacturing Problems. Yr; 1-3 cr. Problems relating to dairy manufacturing. Lab. fee $2.25 per lab. cr. Staff.

200. Research. Yr; *cr. Experimental study of problems in dairy manufacturing. Lab. fee $2.25 per lab. cr. Staff.



DAIRY MANUFACTURING AT WISCONSIN
The dairy department of Wisconsin is important as the state leads in dairying.

# ECONOMIC ENTOMOLOGY

HARLEY FROST WILSON, M.S., *Professor of Economic Entomology, Chairman*
CHARLES LEWIS FLUKE, JR., Ph.D., *Associate Professor of Economic Entomology*
EDWARD MARLBOROUGH SEARLS, M.S., *Assistant Professor of Economic Entomology*
ERWIN CARL ALFONSUS, M.S., *Instructor in Economic Entomology*
THOMAS CORT ALLEN, Ph.D., *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 the curriculum as outlined. 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 for graduate work in 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 subjects is taken up, with the fall and winter care in the apiary being stressed. Lab. fee $2.25. Mr. Alfonsus.

100. THESIS. Yr; 2 cr. Lab fee $2.25 per lab. cr. Mr. Wilson and Staff.

103. ORCHARD INSECTS. II; 2 cr. 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 1932-33 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 1933-34 and in alternate years. Lab. fee $2.25. Mr. Searls.

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. Prerequisite: Econ. Ent. 10. Lab. fee $2.25. Mr. Alfonsus.

118. TAXONOMY OF ADULT INSECTS AND TOPICAL WORK. I, II; *cr. First semester includes one lecture and one laboratory a week on general taxonomy. Second semester planned for those desiring to carry on advanced group taxonomy.

Prerequisite: Econ. Ent. 1 or 2. Lab. fee $2.25 per lab. cr. Mr. Wilson, Mr. Fluke, Mr. Searls.

120. INSECT ECOLOGY. II; 3 cr. Insects in relation to their environment. A survey and study of insect communities and successions with special reference to the insects of Wisconsin. Lectures, laboratory, and frequent field trips. Prerequisite: Econ. Ent. 1 or 2 and 118. Offered 1932-33 and in alternate years. Lab. fee $2.25. Mr. Alfonsus.

121. METHODS IN ECONOMIC ENTOMOLOGY. II; 2 cr. Insect drawing and photography; methods of rearing, collecting, preserving of immature stages, adults, and injuries; technique of project work. Prerequisite: Econ. Ent. 1 or 2. Offered 1933-34 and in alternate years. Lab. fee $4.50. Mr. Fluke.

123. TAXONOMY OF INSECT LARVAE. I; 3 cr. A study in the identification and morphology of immature insects. Lecture and laboratory. Prerequisites: Economic Entomology 2 and 120 or consent of instructor. Lab. fee $4.50. Mr. Searls.

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. Searls.

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., *Professor of Genetics*

MALCOLM ROBERT IRWIN, Ph.D., *Assistant Professor of Agricultural Bacteriology and Genetics*

KARL IVAR JCHANSSON, Ph.D., *Assistant Professor of Genetics*

DELMER CLAIRE COOPER, Ph.D., *Research Associate in 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 or graduate standing. Lab. fee $2.25. Mr. Brink.

120. SEMINARY. Yr; 1 cr. Consent of instructor required before election. Mr. Cole.

180. 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*
ISME HOGGAN, Ph.D., *Instructor in Horticulture*
GEORGE WILLIAM LONGENECKER, B.S., *Instructor in Horticulture*
NORMAN ARTHUR MORRIS, B.S., *Instructor in Horticulture*
WILLIAM BUTLER OGDEN, B.S., *Instructor in Horticulture*

The courses offered in horticulture permit the student to specialize 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, 3, 5, 6, 7, and 12 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.

A CLASS IN VEGETABLE GARDENING
Each student propagates plants for his garden and actual practice is given in gardening.

Majors in horticulture may count a maximum of five credits towards the major requirement by electing Economic Entomology 1, 103 or 105 and Plant Pathology 5 or 101. Landscape majors may substitute Art Education 50 for Animal Husbandry 1 and Topographical Engineering 108 for Mathematics 71 in the freshman year. Such students are also referred to courses in city planning offered by the College of Engineering.

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.

3. VEGETABLE GARDENING. II; 3 cr. The growing of vegetables out-of-doors. Practical work in the gardens. Optional subject for all agricultural students. Lab. fee $4.50. Mr. Moore.

5. SMALL FRUIT CULTURE. I; 2 cr. Culture of cane, bush and other small fruits. Offered in 1934-35 and alternate years. Mr. Moore.

6. PRINCIPLES OF LANDSCAPE DESIGN. I; 3 cr. Discussion of the principles of landscape art. Field and laboratory work in the study of landscape plants and the making of planting plans. A trip will be taken to a nursery for the purpose of studying plant materials and nursery practice. Lab. fee $2.25. 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. HOME HORTICULTURE. II; 3 cr. A consideration of the growing and use of plants and flowers for home beautification and the production of vegetables and small fruits for home use. Designed primarily for women. Offered in 1933-34 and alternate years. Laboratory fee $2.25. Mr. Moore and staff.

12. ELEMENTARY HOME GROUNDS DESIGN. II; 3 cr. A continuation of Horticulture 6 dealing specifically with the problems of grounds beautification. Prerequisite: Hort. 6 or consent of instructor. Lab. fee $2.25. Mr. Aust, Mr. Longenecker.

13. LAWNS. I; 2 cr. A study of ground forms, terracing, grading, and estimating; assigned problems. Prerequisite: consent of instructor. Offered in 1934-35 and alternate years. Lab. fee $2.25. Mr. Longenecker.

14. LANDSCAPE CONSTRUCTION PROBLEMS. Yr; 3 cr. I, Design and construction of walls, steps, ramps, drives, and walks. II, Design and construction of garden features such as pools, bird baths, arbors, and seats. Prerequisite: Hort. 6. Offered in 1933-34 and alternate years. Lab. fee $4.50 per semester. Mr. Aust, Mr. Longenecker.

100. THESIS. Yr; 2 or more credits. Research work on horticultural subjects. Fees depend upon character of thesis work. Lab. fee $2.25 per lab. credit. Mr. Aust, Mr. Johnson, Mr. Moore, Mr. Roberts.

101. ADVANCED HOME GROUNDS DESIGN. I; 3 cr. Design of estates, country home grounds, and related problems. Prerequisite: Hort. 6 and 12, or consent of instructor. Lab. fee $4.50. Offered in 1933-34 and alternate years. Mr. Aust, Mr. Longenecker.

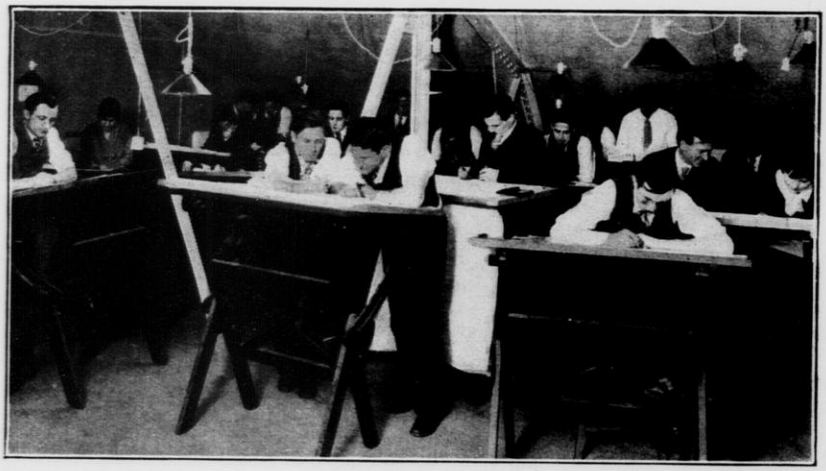
102. PUBLIC GROUNDS. II; 3 cr. Landscape problems in connection with public buildings. Park and cemetery design. Roadside planting. Lab. fee $4.50. Offered in 1933-34 and in alternate years. Mr. Longenecker.

105. PLANT ECOLOGY AND DESIGN. I; 2 cr. A study of plant forms, color, and texture in landscape design. Prerequisite: Hort. 104. Offered 1933-34 and alternate years. Lab. fee $2.25. Mr. Longenecker.

110. SEMINARY. Yr; 1 cr. For advanced and graduate students. Mr. Aust, Mr. Roberts.

121. HORTICULTURAL PROBLEMS. Yr; 1-3 cr. Assigned problems in the phase of horticulture in which the student is particularly interested. Lab. fee $2.25 per cr. Mr. Aust, Mr. Longenecker, Mr. Moore, Mr. Roberts.

122. ADVANCED POMOLOGY. Yr; 2 cr. Recent theory, and practice regarding problems of commercial orcharding. Lectures, laboratory and field work on fruitfulness, cultural practices, thinning, harvesting, storing, marketing, classification, identification, and judging of fruits. First semester problems relating



LANDSCAPE ART
An interesting field of work is found in landscape gardening.

to fruit; second semester problems of orchard practice. Prerequisite: Hort. 1 or consent of instructor. Lab fee $2.25. Mr. Roberts.

124. RURAL-REGIONAL PLANNING. II; 2-3 cr. A seminary approach to the field of rural regional planning. Analysis of actual case studies of land classification, land utilization, and rural ecology as these apply to the creation of rural development plans and zoning ordinances for any given region. The extra credit is based upon topical and drafting room work. Prerequisites: Graduate standing or seniors with consent of instructors. Mr. Aust, Mr. Kolb, Mr. Wehrwein.

## LIBRARY

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

1. LIBRARY PRACTICE. I; 2 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*
ALBERT JOYCE RIKER, Ph.D., *Professor of Plant Pathology*
RICHARD ENGLISH VAUGHAN, M.S., *Professor of Plant Pathology*
JOHN CHARLES WALKER, Ph.D., *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, 220, 221, 249 and 252 are offered in the Department of Botany, College of Letters and Science and do not count toward the 50 credits required in the College of Agriculture.

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 season to secure material. Lab. fee $2.25 per lab. cr. 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. Riker.

104. Morphology of Fungi. I; 3 cr. Prerequisite: Botany 1. Lab. fee $3.50. Mr. Gilbert.

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 1933-34 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 1933-34 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 1933-34 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 1934-35 and in alternate years. Lab. fee $2.25. Mr. Walker.

122. Fungicides in Relation to Host and Parasite. II; 1 cr. Advanced course, intended primarily for students specializing in plant pathology and horticulture. Prerequisite: Plant Path. 101. Offered 1934-35 and in alternate years. Mr. Keitt.

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.

249. Special Physiology of Pathogenic Fungi. II; 2 cr. Prerequisite: Botany 146. Mr. Duggar.

252. Cytology of Fungi. II; 2 cr. Prerequisite: At least one semester of general cytology. Lab. fee $3.00 per cr. Mr. Gilbert.

STUDYING PLANT DISEASES

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

# POULTRY HUSBANDRY

JAMES GARFIELD HALPIN, B.S., *Professor of Poultry Husbandry, Chairman*
JOHN BARRY HAYES, B.S., *Associate Professor of Poultry Husbandry*
GERALD EVERETT ANNIN, B.S., *Instructor in Poultry Husbandry*
CLAYTON ERNEST HOLMES, M.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 120, Agr. Chem. 122, Zoology 105 and 109. 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, Livestock Feeding; Agricultural Chemistry 122, Animal Chemistry; Agricultural Economics 127, Cooperative Marketing; Agricultural Economics 128, Marketing Agricultural Products; and Genetics 105, Animal Genetics; Agricultural Engineering 2, Farm Structures.

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. Optional subject for all agricultural students. Lab. fee $2.25. 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. Prerequisites: 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.

# RURAL SOCIOLOGY

JOHN HARRISON KOLB, Ph.D., *Professor of Rural Sociology, Chairman*
ELLIS LORE KIRKPATRICK, Ph.D., *Associate Professor of Rural Sociology.*
ARTHUR FREDERICK WILEDEN, M.S., *Assistant Professor of Rural Sociology*

Social and human relationships in modern agriculture are of increasing importance. This is true when viewed from any standpoint, whether of the farm and home, the professional worker as teacher, extension worker, clergy, editor, or the various agricultural industries. Courses in this department seek to give a broad as well as an intensive view of the rapidly changing phases of rural life. Changes imply adjustments in the many social institutions and agencies working in rural society, such as family, school, church, store, newspaper, farmers' organization or marketing association. Farming needs to be considered as a mode of life and as a series of group relations beginning with the family and extending to the neighborhood, the town-country community, and in these days of rapid travel, even on to the city.

There are at least two ways in which students may work in the field of Rural Sociology. First, a program leading to a full major and looking toward teaching, research, or extension work may be arranged. In such a plan 10 credits shall be taken in the department and 5 credits selected in any one of the following departments: Agricultural Economics, Agricultural Education, Agricultural Journalism, Horticulture, Home Economics, or Sociology in the College of Letters and Science. Credits thus chosen in Letters and Science may count on the major, but shall not be counted as a portion of the 50 credits required in agricultural subjects.

Second, courses in the department may be selected as electives by students majoring in other departments, who wish to gain a wider perspective concerning the social arrangements of present-day rural society.

25. RURAL LIFE. I; 3 cr. The study of Rural Society: Its organization and relations, such as families, neighborhoods, villages, interest groups, town-country and rural-urban relations; its people, such as their changing characteristics and mobility; its social institutions, such as those for education, religion, standards of living, sociability, recreation, health, social welfare, local government. Prerequisite: Sophomore standing. Mr. Kolb.

100. THESIS. Yr; 2 cr. Original work on problems pertaining to rural communities. Staff.

124. RURAL-REGIONAL PLANNING. II; 2-3 cr. A seminary approach to the field of rural-regional planning. Analysis of actual case studies of land classification, land utilization, and rural ecology as these apply to the creation of rural development plans and zoning ordinances for any given region. The extra credit is based upon topical and drafting room work. Prerequisites: Graduate standing or seniors with consent of instructors. Mr. Aust, Mr. Kolb, Mr. Wehrwein.

125. RURAL SOCIAL TRENDS. I; 2 cr. An advanced course in a systematic study of Rural Society, giving emphasis to the point of view of leading authorities and to the important findings of research including recent studies in rural social trends. Teaching and extension methods will be given attention. Prerequisite: Sociology 25 or equivalent, or senior or graduate standing. Mr. Kolb.

126. RURAL STANDARDS OF LIVING. II; 2 cr. Development of standards of living in rural communities. Consideration of all elements composing the standard of living; food, housing, transportation, education, religion, art and recreation, in relation to income, trading centers, social institutions, and local groupings. Prerequisite: Junior standing. Mr. Kirkpatrick.

200. RESEARCH. Yr; *cr. Rural social organization and rural life. Mr. Kolb. Rural standards of living. Mr. Kirkpatrick. Community organization and leadership and extension methods. Mr. Wileden.

225. SEMINARY IN RURAL SOCIAL RESEARCH. I; 2 cr. Emphasis upon the scope and method of research in this field. Case studies of current research projects with particular attention to those concerned with various phases of community organization, standards of living, rural population, farmers' organizations, social institutions, rural government, social psychology and social trends. Mr. Kolb.

## SOILS

ANDREW ROBINSON WHITSON, B.S., *Professor of Soils, Chairman*
CLINTON JOSEPH CHAPMAN, B.S., *Professor of Soils*
FRED LUDWIG MUSBACH, B.S., *Professor of Soils*
EMIL TRUOG, M.S., *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, Ph.D., *Instructor in Soils*

Soils 1 is prerequisite to all other courses in soils. Soils 122 and 126 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 take 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 or 126, 2 or 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, Agricultural 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

A STUDY OF THE PROBLEMS OF THE SOIL
Students may take laboratory practice on soils in this room and carry on investigations of soils from the home farm.

above for the general major, but choose supplementary electives from the following group: Agr. Engr. 5, 102; Agronomy 102, 106, 120; Botany 129; Chemistry 11 or 12; Geology 1, 11; Soils 121.

Students preparing to become soil chemists or physicists should take Soils 1, 5 cr., and Soils 122, 3 cr., or 126, 2 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., Geology 17, 3 cr., Agronomy 106, 3 cr., should be elected in the sophomore or junior year; Chemistry 120, 3 or 5 cr., a language, Agronomy 102, 2 cr., and Agr. Bact. 123, 3 cr., in the junior year; Chemistry 130, 5 cr., in the senior year.

Not to exceed 5 credits from the following courses may be counted as a portion of the undergraduate major requirement in Soils; Agr. Bact. 123, 3 cr., Geology 1, 5 cr., Geology 17, 3 cr., Agronomy 102, 2 cr., Agronomy 106, 3 cr.

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.

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, com-

plete 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; 2-4 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. Offered 1932-33 and alternate years. Mr. Graul.

125. Soil and Land Classification; Agricultural Climatology. 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.

126. Fertilizers and Manures. II; 2 cr. Lectures and discussions on the composition, manufacture, and characteristics of artificial fertilizers. Methods of application, deportment in the soil, and practical use with and without farm manure. Prerequisite: Soils 1. Alternates with course 122, Soil Physics and Tillage. Offered 1933-34 and alternate years. Mr. Graul.

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, Emeritus*
Burr Abraham Beach, D.V.M., *Associate Professor of Veterinary Science*
Chester Albern Herrick, Sc.D., *Assistant Professor of Zoology and Veterinary Science*
Edwin Reinhold Carlson, D.V.M., M.S., *Assistant in Veterinary Science*

The subjects described below give 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, animal parasitology 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. NON-INFECTIOUS DISEASES OF LIVESTOCK. I; 2 cr. Their causes, symptoms, prevention, and treatment, including conformation and soundness. Mr. Hadley.

100. THESIS. Yr; 2 cr. Mr. Hadley, Mr. Beach, Mr. Herrick.

123. INFECTIOUS DISEASES OF LIVESTOCK. II; 2 cr. Their causes, diagnosis, control and eradication. Prerequisite: A course in veterinary science or bacteriology. Mr. Hadley.

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 1933-34 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 1934-35 and in alternate years. Lab. fee $4.50. Mr. Hadley and Staff.

180. TOPICAL WORK. Yr; *cr. Assigned work for advanced students. Mr. Hadley and staff.

200. RESEARCH. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Hadley, Mr. Beach, Mr. Herrick.

## THE REGENTS OF THE UNIVERSITY

State-at-Large—Carl Drexler, Menasha ..... 1936
State-at-Large—Gunnar Gundersen, La Crosse ..... 1937
State-at-Large—Daniel H. Grady, Portage ..... 1938
State-at-Large—Arthur Sholts, Oregon ..... 1935
First District—Robert V. Baker, Jr., Kenosha ..... 1937
Second District—Fred H. Clausen, Horicon ..... 1936
Second District—Harold M. Wilkie, Madison ..... 1937
Third District—Mrs. Clara T. Runge, Baraboo ..... 1938
Fourth District—Mrs. Meta Berger, Milwaukee ..... 1934
Fifth District—Judge A. C. Backus, Milwaukee ..... 1933
Sixth District— ..... 1933
Seventh District—George W. Mead, Wisconsin Rapids ..... 1934
Eighth District—Herman W. Ullsperger, Sturgeon Bay ..... 1936
Ninth District—Rev. E. M. Christopherson, Pigeon Falls ..... 1937
Tenth District—Peter Eimon, Superior ..... 1935

Glenn Frank, President of the University, *ex-officio.*
John Callahan, State Superintendent of Public Instruction, *ex-officio.*

### OFFICERS OF THE REGENTS

Fred H. Clausen, President
Harold M. Wilkie, Vice-President
Robert K. Henry, State Treasurer, *ex-officio* Treasurer
James D. Phillips, Business Manager
Maurice E. McCaffrey, Secretary

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## THE BOARD OF VISITORS

*Appointed by the Regents*

Mrs. Charles R. Carpenter, Madison ..... 1934
George P. Hambrecht, Madison ..... 1935
Loyal Durand, Milwaukee ..... 1936
Fred H. Dorner, Milwaukee ..... 1936

*Appointed by the Alumni*

B. E. McCormick, Madison ..... 1932
Mrs. Lucy M. Johnson, Madison ..... 1933
B. A. Kiekhofer, Milwaukee ..... 1934
Judge Evan A. Evans, Chicago ..... 1935

*Appointed by the Governor*

Mrs. Allan Classon, Oconto ..... 1932
Carl J. Hesgard, Orfordville ..... 1933
W. W. Kelly, Green Bay ..... 1934
Mrs. Allan J. Roberts, Milwaukee ..... 1935

## THE COLLEGE OF AGRICULTURE

Chris L. Christensen, Dean and Director
I. L. Baldwin, Assistant Dean
K. L. Hatch, Associate Director of Extension
N. Clark, Assistant Director of Experiment Station
A. J. Haas, Executive Secretary