The Institute of Agriculture traces its history to 1869 when the University was designated as Tennessee’s Federal Land-Grant Institution. Under terms of the Federal Land-Grant Act, the University was enabled for the first time to offer instruction in agriculture. This later was expanded to include research for the development of new knowledge and extension for dissemination of such knowledge to rural people. Today, the Institute has four main divisions: College of Agriculture, College of Veterinary Medicine, Agricultural Experiment Station, and Agricultural Extension Service. In addition to agriculture and veterinary medicine the Institute conducts research and extension programs in home economics.

Agricultural Experiment Station

Dorsey M. Gossett, Dean
Thomas J. Whitley, Associate Dean
John I. Sewell, Assistant Dean

The Agricultural Experiment Station was established in 1887 by an act of Congress known as the Hatch Act. The purpose of the Experiment Station is to promote fundamental and applied research on all problems primarily affecting the people of Tennessee, but also having national and international implications. The research program embraces studies of the productivity of soils, plants, animals, other capital and people and the combination of these resources necessary to maintain a viable agriculture. Specific research projects relate to development of new and improved crop varieties, insect, disease, and weed control methods, cultural and harvesting techniques, and improved genetics, nutrition, physiology and management of livestock. Other studies deal with various aspects of processing and distributing food and fiber, consumer preferences, food safety and nutritional needs and maintenance of institutions to serve people.

The results of investigations are carried to the clientele in the form of bulletins, circulars, and reports through the Agricultural Extension Service, and the state educational system through the Colleges of Agriculture and Education. Headquarters as well as the Main Station of the Agricultural Experiment Station are located at Knoxville. Eleven branch stations are located across the State. These stations are essential as research laboratories to test the performance of crop and livestock enterprises grown under different soil, climatic, and environmental conditions. The locations of the Branch Stations are as follows:
- Ames Plantation near Grand Junction includes 18,500 acres (about 10,000 acres in forest). The resources are held in trust by the Hobart Ames Foundation for use by the Institute of Agriculture. Large scale experiments involve forestry, farm management, crop production, and genetics and management of beef cattle and swine.
- Dairv Experiment Station near Lewisburg is operated in cooperation with USDA/SEA/AR. Major emphases are genetics, physiology, nutrition, and management of Jersey cattle. Production, handling and preservation of feed for dairy cattle are also being evaluated along with waste management systems.
- Forestry Experiment Stations and Arboretum at Oak Ridge, Tullahoma, and Wariburg. The 250-acre arboretum at Oak Ridge places emphasis on woody plants. Research in forestry studying genetics, species adaptation, fertilization, and other management practices are under way on the adjoining land. The Cumberland forest consists of two tracts of land in Morgan and Scott counties. Research at this location deals with many of the forest problems in the Cumberlands including strip-mine reclamation. The Highland Rim Forestry Station is located near Tullahoma. Research at this location deals primarily with tree improvement through genetics and also management problems associated with the forest of the Highland Rim.
- Highland Rim Experiment Station near Springfield emphasizes research on field crops and beef cattle. A major thrust is on the development and culture of improved darkfired tobacco varieties. Other research involves problems associated with other agronomic crops, horticultural crops, and forages produced on the Highland Rim and management of beef cattle.
- Middle Tennessee Experiment Station near Spring Hill is representative high-phosphate Central Basin soils. Research studies are underway with agronomic crops, vegetables, fruits, ornamental horticulture, beef cattle, and dairy cattle of the Holstein breed.
- Milan Experiment Station is located in West Tennessee. Research emphases are production problems and mechanization of corn, cotton, and soybeans. Minimum tillage and other approaches to reduce soil erosion are a major thrust at this location.
- Plateau Experiment Station near Crossville consists of three farms. Studies with beef cattle, and agronomic and vegetable crops provide information about results to be expected under the cooler, more humid climate and special soil conditions of the Cumberland Plateau.
- Tobacco Experiment Station is located near Greeneville. Extensive research on all phases of burley tobacco is in cooperation with USDA/SEA/AR. In addition, research is underway with beef cattle and other field crops.
- UT-Martin—The research farm, adjacent to the UT-Martin Campus, is used for both research and teaching. The research staff at Martin, jointly employed by the Experiment Station and the School of Agriculture, cooperate with other station personnel in planning and conducting research on field crops, beef cattle, dairy cattle, and swine. Emphasis is on problems of importance to the northwestern part of the State.
- West Tennessee Experiment Station is located at Jackson. Major emphases are all phases of production on agronomic crops produced in the western part of the State. In addition, research deals with problems associated with fruit and vegetable production and dairy production. The USDA/SEA-AR cooperates with research on the soybean cyst nematode.
Agricultural Extension Service

M. L. Downen, Dean
Troy W. Hinton, Associate Dean
Mildred F. Clarke, Assistant Dean
B. G. Hicks, Assistant Dean

The Agricultural Extension Service serves the entire state of Tennessee. This educational service of the Institute of Agriculture is active in every county extending information on agriculture, home economics, and related subjects to farm families and other citizens. This educational organization was established July 1, 1914, by an act of Congress commonly known as the Smith-Lever Act. Staff members of the Agricultural Extension Service use a wide range of methods—farm and home visits, educational meetings, field demonstrations, publications, and mass media—in providing educational programs for people who do not have the opportunity to enroll in resident courses of instruction at colleges.

Extension staff members develop and carry out programs meeting the specific needs of the residents of their counties. They work with both adults and youth. Educational activities for boys and girls are carried out through 4-H Clubs which are organized in schools and in communities.

County, state, and federal governments cooperate in carrying out the Agricultural Extension Service program. The United States Department of Agriculture, the State of Tennessee, and each county government provide the financial support. Any county which appropriates funds for the program may have an office located there to serve its residents. Most offices are located in county seat towns.

Headquarters for the Agricultural Extension Service is at Knoxville and district administrative offices are located in Cookeville, Knoxville, Chattanooga, Nashville, and Jackson.

As a distinct administrative unit of the Institute of Agriculture, the Agricultural Extension Service works closely with the other units of the Institute—the Agricultural Experiment Station, the College of Agriculture, the College of Veterinary Medicine—in providing a total program of research, instruction, and extension for developing the agriculture of the state.

College of Agriculture
O. Glen Hall, Dean

Curricula in Agriculture
Broad opportunities for individuals to prepare for a future in agriculture, forestry, and wildlife and fisheries science are offered in the College of Agriculture. The college provides curricula leading to the degrees of Bachelor of Science in Agricultural Engineering, Bachelor of Science in Forestry, and Bachelor of Science in Wildlife and Fisheries Science. The professional degree program in agricultural engineering receives strong support from the College of Engineering and is fully accredited by the Accreditation Board for Engineering and Technology. The forestry curriculum is fully accredited by the Society of American Foresters.

A pre-professional curriculum in veterinary medicine is offered in the college. This program is designed to prepare students for admission to the College of Veterinary Medicine located on the Knoxville campus. Students pursuing programs leading to the degree of Bachelor of Science in Agriculture major in one of several specialized areas of agriculture offered in the college. These major areas are agricultural economics and rural sociology, agricultural education, agricultural mechanization, animal science, food technology and science, ornamental horticulture and landscape design, and plant and soil science. Specific courses required for each of these areas are given under the departmental headings in this section of the catalog. A student must complete the curriculum in 198 quarter-hour credits in which the student is majoring in order to receive a degree. In all areas of specialization, particular emphasis is placed upon the sciences as a background for agricultural instruction; other courses are provided to give a liberal education. In all subject-matter departments there is the opportunity to select elective courses appropriate to the educational objectives of individual students. The choice of electives in such courses should be made with the guidance of the faculty adviser.

All academic and general requirements of the University as stated in the front section of this catalog must be met by agricultural students, and they must complete the requirements in one of the organized curricula. Students transferring into the College of Agriculture from other than the UT-K campus must have a grade point average of 2.0. Each curriculum leading to the Bachelor of Science in Agriculture includes the requirements of the basic curriculum for agriculture. For this degree, the minimum requirement is 198 quarter-hour credits. A minimum of 45 hours in agricultural courses is required. For the degrees of Bachelor of Science in Forestry and the Bachelor of Science in Wildlife and Fisheries Science, the minimum requirement is 199 quarter-hour credits. For the degree of Bachelor of Science in Agricultural Engineering, the minimum requirement is 198 quarter-hour credits.

The use of transfer credit in technical agriculture in such organized curriculum will be considered and approved by the adviser of that curriculum and the dean of the College of Agriculture. When desirable, validating or proficiency examinations may be requested to determine competence in an area and to avoid unnecessary repetition. Such examinations should be taken during the first quarter in residence and must be conducted under the supervision of the head of the department in which the course is offered.

A minimum of 27 quarter hours of upper-division technical agriculture appropriate to a specified major requirement, and approved by the major adviser, must be completed in residence to fulfill the requirements of baccalaureate degrees offered in the college.

Satisfactory/No Credit Courses
Students may include a maximum of 30 hours in non-directed electives taken on a satisfactory/no credit basis in the total hours required for graduation.

Graduate Study in Agriculture

MAster of Science Programs

Programs of graduate study leading to the Master of Science degree are offered in all departments in the College of Agriculture. See the Graduate Catalog for details.

A Winter Short Term for Agricultural Extension Personnel and other professional agricultural workers will be offered during the last half of the winter quarter. Those attending must be accepted by the Graduate School. Students may take three courses and earn nine quarter hours of graduate credit toward the Master of Science degree. A number of courses are offered annually in agricultural extension education and in other departments in the College of Agriculture.

Additional information and a five-year schedule of course offerings may be obtained by writing to Professor R. S. Dotson, Head, Department of Agricultural Extension Education, College of Agriculture, Knoxville.

Doctoral Programs

Graduate study programs lead to the Doctor of Philosophy degree in animal sciences, agricultural economics, agricultural engineering, food technology science, and plant and soil science.

General requirements and policies of The Graduate School of The University of Tennessee relating to admission to the Graduate School, residence, language, research, examination, and admission to candidacy shall apply to these programs and are described in the Graduate Catalog.

Facilities

The College of Agriculture uses the facilities on the agricultural campus, on University farms located near Knoxville, and on the main University campus. On the agricultural campus are found the main agricultural buildings, Morgan Hall, the Agricultural Engineering Building, McCord Hall, the Dairy Products Building; McLeod Food Technology Building; C. E. Brehm Animal Sciences Building, which includes a large pavilion; Ellington Hall which houses the plant science departments; and greenhouses for teaching and experimental work. The buildings which have been erected recently provide facilities comparable to the best in the country for the departments which they serve.

Four farms adjacent to or within eight miles of the agricultural campus are used both for instructional and experimental purposes. Morgan Farm (80 acres), Cherokee Farm (550 acres), Plant Science Farm (212 acres), and a livestock farm (510 acres) provide excellent field laboratory facilities for instructional programs offered in the College. Cherokee Woodlot (120 acres), the Oak Ridge Forest (2,260 acres), and Ames Plantation (8,000 acres of forested land) provide excellent facilities for field work in forestry.

Transportation by bus is provided for classes of agricultural students going from the agricultural campus to the University farms and to other points of interest where instruction may be given. Transportation by bus is provided between the agricultural campus and the main University campus so that students may make the change between classes without serious inconvenience.

The facilities of the University on the main campus are available to agricultural students. Courses in the basic sciences, business, communications, engineering, etc., are open to
Agricultural students and are taught on the main University campus.

Selection of Curriculum

Agricultural students who have determined their area of special interest may choose the curriculum most adaptable to their needs when they register as freshmen, and an adviser from the department will be assigned for their counseling. It is not necessary, however, that freshman students select their curriculum until the end of the first year. Those who are in doubt will be assigned a special adviser to assist them in exploring agriculture and to guide them in the planning of appropriate courses of study for the freshman year. When they choose a curriculum, an adviser will be assigned from that department.

Students with special interest in science, business, or production technology should consult the adviser about selection of appropriate electives. A foundation for advanced study beyond the baccalaureate degree may be established in any curriculum if appropriate electives are included; also, courses may be elected in any of the curricula leading to the degree of Bachelor of Science in Agriculture, in preparation for employment with the Agricultural Extension Service. For this purpose, both the major-curriculum adviser and the agricultural-extension adviser should be consulted.

A very careful choice of electives enables a student with an above average academic record to complete a double major by satisfying all the requirements in each curriculum. For this purpose, the advisers of each curriculum should be consulted, the dean of the College of Agriculture should be informed, and each adviser should maintain a complete record of the student's progress.

Optional Minors: Agricultural students may have single or multiple minors in agriculture or in other colleges recorded on their transcripts without regard to course overlap among majors and minors. A minor in a department of the College of Agriculture requires a minimum of 24 credit hours in courses numbered 2000 and above with the majority of credit hours at the 3000 and 4000 level. At least 12 of the credit hours required for the minor must be completed at UTK. Specific requirements are listed by each department offering a minor.

Minors offered in the College of Agriculture are open to students of other colleges who have the approval of their advisor and department. Students who transfer to the College of Agriculture from another institution, or from another college in UTK, should consult the dean to be sure that the credit they wish to follow and for assignment to an appropriate major. Requests for substitutions or special examinations should be submitted for consideration during the first three quarters of study in the selected curriculum.

Basic Curriculum for Agriculture

All students except those majoring in ornamental horticulture and landscape design working for a degree of Bachelor of Science in Agriculture will follow the same requirements for the first three quarters of study. The sequence and the selection of courses not specified will be guided by the adviser.

Agriculture 1140. Plant Science for Agriculture
Agriculture 1180. Food Technology and Science for Agriculture
Agriculture 1190. Animal Science for Agriculture

Agriculture 1120. Introduction to Agricultural Science
Agriculture 1110. Introduction to Social Science

Agriculture 2110-20-30-40-50

Agriculture 2200. Principles of Farm Management
Agriculture 2210. Principles of Farm Management

Agriculture 2400. Principles of Farm Management
Agriculture 2410. Principles of Farm Management

Agriculture 3110. Principles of Farm Management
Agriculture 3120. Principles of Farm Management

Mathematics 1400-50-60

English and Communications. (English 1010 or 1011 or 1020 or 1031 or 1032 or 1033, Speech 2311, and five credit hours in communications)

Mathematics 1400-50-60 (general mathematics)

Biological Science. (entomology and plant pathology, biology, botany, microbiology, or zoology)

Physical Science. (Chemistry 1110-20-30 or 1510-20-30 or physics or geology)

Social Science and Humanities. (Economics 110-20-30, 12 hours—not more than 3 areas)

Other Courses or Electives Hours Specified

By Departments

Total

198

*Equivalent hours courses.

Exception—See Agricultural Business and Agricultural Economics

The five basic courses in agriculture are not departmental, but the course outlines and content were written by a group of experienced teachers representing the appropriate subject-matter areas. They are presented by a team of teachers who work together in selecting material in each course. The five courses are required of all agricultural students, except those majoring in ornamental horticulture and landscape design, who seek the degree of Bachelor of Science in Agriculture, and the five teaching teams coordinate their work carefully to insure a unified program. A major purpose of this basic program is to present freshman agricultural students an appropriate concept of modern agriculture, its role in our economic and social structure, the unity among its several segments, and its relation to other areas of study. Basic subject-matter courses are prerequisites to prepare suitable foundations for further study. These courses serve as strong motivation for study in the physical, biological, and social sciences, and are prerequisite to advanced courses in technical agriculture.

An additional minor is offered as a challenge to exceptional students who desire to explore in greater depth some special topic of unusual significance to agriculture. A team of faculty members share in this seminar as participants and resource people. The students gain experience and are encouraged to assume responsibilities not available in a formal organized course. Association with students and faculty from all phases of agriculture in the study of a common problem provides an unusual challenge.

Course Load

Courses requiring more than 18 hours per quarter must have the approval of the dean of the College.

Agricultural Biology

Adviser: Professor Southard

No undergraduate curriculum exists in agricultural biology, but a program leading to the Master of Science degree with a major in agricultural biology is available (see Graduate Catalog). Courses in economic entomology, plant pathology, soil microbiology, and plant parasitic nematodes are available to agricultural students. The department is currently composed of two major disciplines:

Economic entomology and plant pathology.

The primary objective of offering a major at the graduate level is to provide training in these disciplines which deal with the natural hazards that are the major causes of losses in agricultural production. The training gives such a graduate the foundation necessary for coping with the myriad problems in plant disease, animal diseases, and problems that constantly threaten Tennessee's dynamic agriculture.

Agricultural Economics and Rural Sociology

Agricultural Business Curriculum

Adviser: Professor Martin; Associate Professor Brooker, McLemore, Mundy, Trevers, Park and Whipple

This curriculum is designed to prepare students for employment in the rapidly expanding field of agricultural business. Recognition is given to the desire of many college graduates to continue to work with agriculture through many private and public services where major emphasis is in areas other than farm production. This program emphasizes particularly those capacities needed for the management phases of agricultural business. Course offerings in the College of Business Administration have been used freely in this curriculum.

Preparation is given for such work as crops, livestock and poultry marketing, fertilizer and feed business, cooperative business management, agricultural credit agencies, farm real estate and appraisal services, agricultural representatives with banks, public and private market analysis, agricultural journalism, and farm information services utilizing mass communications.

Freshman

Hours Credit

Agriculture 1110-20-30-40-50 20

Business 1210-20 8

Economics 1010 or 1011 or 1020 or 1031 or 1032 or 1033 9

Mathematics 1450-50-60 or 1850-60 12

Sophomore

Agricultural economics elective 3

Business law elective 4

Chemistry 1110-20 or 1510-20 or Physics 1120-30 or Physics 1130-50 or Chemistry 1110-20 or 1510-20-30 or Physics 1210 or Geology 1410 16

Computer Science 1410 or 1510 or Office Administration 2750 3 or 4

Economics 2110 3 or 4

English 2110 3

Statistics 2100 3

Electives 3

Junior

Accounting 2110-20-30 9

Agricultural Economics 3320 3

Agricultural economics and rural sociology elective 3

Economics 3110 3

Journalism 2210 3

Non-departmental agricultural electives 6

Non-departmental social science and humanities electives 6

Rural Sociology 3420 3

Statistics 3220 3

Electives 3

Senior

Agricultural Economics 4140, 4320, 4120 or Geology 4610 9

Agricultural economics and rural sociology elective 12

Agricultural Economics 4710 or Business Law 4110 4 or 3

Economics 5120 3

Office Administration 4320 3

Non-departmental agricultural electives 3

Institute of Agriculture

59
The curriculum in agricultural education is planned in cooperation with the College of Education. All agricultural education courses are offered in the College of Education.

This curriculum is designed to prepare students for entering professional agricultural educational service. Graduates are qualified to teach vocational agriculture. The curriculum also provides training for those who wish to enter farming, industry, and governmental services associated with agriculture, and other occupations.

The senior courses in agricultural education are taught at selected off-campus centers. These courses are scheduled concurrently each quarter during the regular school year. Students should file applications for student teaching in the agricultural education department at least two quarters prior to the quarter in which the student teaching is desired.

Students meeting the requirements for general vocational agriculture certification may secure endorsements in ornamental horticulture and agricultural mechanics by meeting the following requirements:

Ornamental Horticulture—18 quarter hours of courses in ornamental horticulture and landscape design and/or plant and soil science. Subject matter areas must include plant propagation, greenhouse management, growing media, landscape design, and nursery management.

Agricultural Mechanics—18 quarter hours of courses in agricultural mechanics. Subject matter areas must include agricultural power and machinery, soil and water conservation, and agricultural structures.

Credits

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours Credit</th>
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<tbody>
<tr>
<td>Agriculture 1110-20-30-40-50...</td>
<td>20</td>
</tr>
<tr>
<td>Biology 1210-20...</td>
<td>8</td>
</tr>
<tr>
<td>English 1010 or 1020, 2030 or 2380, 3240, Sociology 3600, 3130.</td>
<td>9 or 10</td>
</tr>
<tr>
<td>Philosophy 2510-20 or 3770; Political Science 2510-20; Psychology 2500 and 2550 or 2540; Sociology 3010, 3130.</td>
<td>9 or 10</td>
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<tr>
<td>TOTAL: 198 hours</td>
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One hour must be in PE. Requires admission to teacher education.

Agricultural Engineering

AGRICULTURAL ENGINEERING CURRICULUM

Advisers: Professors Luttrell and Bledsoe

The College of Agriculture, with the cooperation of the College of Engineering, offers a four-year curriculum leading to the degree of Bachelor of Science in Agricultural Engineering. The curriculum is fully accredited by the Accreditation Board For Engineering and Technology. Industry, government agencies, research organizations, and foreign service offer employment opportunities to agricultural engineers.

The minimum requirements for admission include two units of algebra, one unit in geometry, and one-half unit in trigonometry. Students may remove deficiencies by registering for special classes during the freshman year.

The curriculum gives training in the fundamentals of engineering applied to problems of agriculture. In the senior year, the comprehensive design of systems and their components is emphasized.

Graduates may pursue careers in design, analysis, or development in the following specialty areas: agricultural power and machinery, agricultural structures and environment, electric power and processing, soil and water conservation engineering, and food engineering.

The curriculum provides for elective courses which can be taken in the student's area of interest. Students should check with their advisers each quarter regarding the selection of courses.

Students majoring in agricultural engineering are eligible to participate in the Engineering Cooperative Scholarship program, Engineers' Day program, and other student activities in the College of Engineering. They are also eligible for selection into Tau Beta Pi and Alpha Zeta. Agricultural engineering majors interested in the Cooperative Engineering Scholarship program should consult with the head of the Department of Agricultural Engineering.
The agricultural mechanization curriculum is administered by the Department of Agricultural Engineering and leads to the degree of Bachelor of Science in Agriculture. The curriculum prepares students to apply principles, techniques, and systems of engineering, agricultural science, and business to the broad industry of agriculture.

Agricultural mechanization courses encompass power and machinery, electricity and processing, structures and environment, and soil and water conservation. Students, with the assistance from their adviser, may structure their program to obtain either a broad or a highly specialized education.

Graduates are employed in industry, government, and educational institutions generally in the areas of management, promotion, sales, and training related to agricultural products, materials, and services.

Directed electives-evaluation

Agricultural Extension Education

Advisors: Professor Dotson; Associate Professor Carter

No formal undergraduate curriculum is offered in agricultural extension education, but undergraduate courses are available as electives in each formal curriculum. Courses are designed to: (1) develop in prospective extension workers and other interested students an understanding of the functions, responsibilities, and techniques of the Cooperative Agricultural Extension Service, and (2) provide prospective extension workers with practical extension work experience in selected training counties. Graduate majors and minors are offered in agricultural extension education. Graduate courses are designed to develop in present extension workers and other interested students those competencies needed for improving the effectiveness of their work. Professor Dotson will give guidance for emphasis in agricultural extension education.

Animal Science

Advisors: Professors Barth, Chamberlain, Lidwally, McLaren, Montgomery, Murphee, Richardson, Shirley, Shrode, Swanson; Associate Professors Hitchcock, Holland, Masincupp; Assistant Professors Heitmann, Robbins, and Smalling.

This curriculum is designed to prepare students for leadership careers in livestock and in related industries. Swine, poultry, sheep, dairy, and beef cattle production and management may be involved, providing the opportunity for special or additional training in the dynamic livestock and husbandry technology (production). Through course selection, the student, therefore, may prepare for general or livestock farming, management, business, or science, or elect the pre-veterinary course preparation for specialization. Elective selection permits special training for work with feed companies, meat animal, milk, egg, or poultry production, managerial or marketing groups, or other educational agencies. Supply and equipment business, agricultural extension services, agricultural communication, public relations, and various organizations associated with agriculture.

Students have the opportunity, through appropriate course selection, to obtain double majors by combining the animal science curriculum with another curriculum. Students majoring in the animal science curriculum may, if they desire arrange to minor in various other curricula. The requirements for these minors shall be stipulated by the department supervising that particular curriculum. Students majoring in other curricula may opt in animal science. A minor in animal science consists of a minimum of 28 hours and must include: a) Animal Science 2610, 2610, 3210, 3510, 3610, and 3510 21 hrs. b) One course from Animal Science 3610, 3620, 3630, 3640, or Food Technology and Science 3610 3 hrs. c) One course from Animal Science 4810, 4820, 4830, 4840, or 4860 4 hrs.

Agricultural Mechanization CURRICULUM

Advisers: Professors Luttrell and Shelton

The agricultural mechanization curriculum is designed to prepare students for leadership careers in livestock and in related industries. Swine, poultry, sheep, dairy, and beef cattle production and management may be involved, providing the opportunity for special or additional training in the dynamic livestock and husbandry technology (production). Through course selection, the student, therefore, may prepare for general or livestock farming, management, business, or science, or elect the pre-veterinary course preparation for specialization. Elective selection permits special training for work with feed companies, meat animal, milk, egg, or poultry production, managerial or marketing groups, or other educational agencies. Supply and equipment business, agricultural extension services, agricultural communication, public relations, and various organizations associated with agriculture.

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Agricultural Mechanization CURRICULUM

Advisers: Professors Luttrell and Shelton

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Agricultural Mechanization CURRICULUM

Advisers: Professors Luttrell and Shelton

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Agricultural Mechanization CURRICULUM

Advisers: Professors Luttrell and Shelton

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### Pre-Veterinary Medicine Option

Advisers: Professors Barth, Chamberlain, Lidvall, McLearen, Montgomery, Murphie, Richardson, Shirley, Shrode; Associate Professors Hitchcock, Hoftowery, McManus; Assistant Professors Heimann, Robbins, Smalling.

This program is designed to guide the student in meeting the admissions requirements of The University of Tennessee College of Veterinary Medicine. The completion of specific subject matter requirements and the attainment of a satisfactory grade point average comprise the minimum requirements for entrance into the professional curriculum of the College of Veterinary Medicine. However, each year the number of applicants is much greater than the number of available spaces. Therefore, meeting or surpassing the minimum requirements does not assure acceptance by the College of Veterinary Medicine, and each pre-veterinary medical student should, early in the college career, elect a possible alternative career choice. The admission requirements listed below are those required by The University of Tennessee College of Veterinary Medicine. Their completion will generally fulfill the requirements for other veterinary colleges. However, students intending to apply to schools other than The University of Tennessee should check the requirements of those specific schools. Students intending to apply to The University of Tennessee College of Veterinary Medicine must complete a minimum of 120 hours. They must complete their pre-veterinary requirements by the end of the third year to receive a B.S. in Agriculture.

#### Third year
- **Biochemistry** 4110-20: 3
- **Microbiology** 2910-19: 5
- **Economics** 2120: 3
- **Social sciences electives**: 8
- **Humanities electives**: 8
- **Animal science 3420, 3600 level evaluation**: 10
- **Electives**: 14
- **Total Credits**: 59

1. Students with a strong math background may omit Math 1540 and start with 1550 or elect to take the 1640-50-60 series or 1841-51.
2. Courses required to meet the minimum of 13 hours of animal science for admission to the veterinary college.
3. A recommended elective for students with limited or no practical animal experience and required for those attempting to obtain a B.S. in Agriculture major in animal science in the regular program and is required for those accepted to UT College of Veterinary Medicine after three years and who wish to obtain a B.S. in Agriculture with a major in animal science after completion of the first year in the College of Veterinary Medicine.
4. Students wanting to complete pre-vet requirements, but wishing to major in a department other than animal science, should consult with the appropriate departmental adviser for a proper selection of electives.

### Animal Science Curriculum with a Pre-Veterinary Option

This program is designed for students accepted by the UT College of Veterinary Medicine after their third undergraduate year who wish to obtain a B.S. in Agriculture with a major in animal science upon completion of the first year in the College of Veterinary Medicine.

The student will need to complete the requirements as established by the College of Veterinary Medicine. In addition, the student needs to complete requirements as listed above, including Economics 2110-20 or 2130, and, under electives, complete Agriculture 1150 or equivalent food technology and science course, Plant and Soil Science 2130, and other courses in animal science, six hours. (suggested: Agriculture Mechanization 4160, Food Technology and Science 3840, Entomology and Plant Pathology 3210, Plant and Soil Science 3140).

The following graduate level courses are available to agricultural students. The Master of Science degree with a major in agricultural biology, but a program leading to the Doctor of Veterinary Medicine. Their completion will generally fulfill the requirements for the degree.

#### Entomology and Plant Pathology

Adviser: Professor Southard

No undergraduate curriculum exists in agricultural biology, but a program leading to the Master of Science degree with a major in entomology and plant pathology is available (see Graduate Catalog). Courses in economic entomology, plant pathology, soil microorganisms, and plant parasitic nematodes are available to agricultural students. The department is currently composed of two major disciplines: economic entomology and plant pathology. The primary objective of offering a major at the graduate level is to provide training in these disciplines which deal with the natural hazards that are themal causes of losses in agricultural production. The training gives such a graduate the foundation necessary for coping with the myriad insect and plant disease problems that continue to threaten Tennessee’s dynamic agriculture.

### Food Technology and Science

Advisers: Professors Miles, Collins, Jaynes, and C. Melton, Associate Professor S. Melton, Assistant Professor Mount.

Food technology and science is the application of the sciences and engineering to the manufacture, preservation, storage, transportation, and consumer use of food products. Processing of raw food materials into consumer products by canning, freezing, dehydrating, fermenting, preserving, etc., is taught with emphasis on food technology and science after completion of the first year in the College of Veterinary Medicine. Therefore, men and women who plan to enter food technology must have an interest in the sciences, particularly chemistry, biology, microbiology, and physics.

This curriculum is designed to prepare students for a professional career in positions in the food industry such as food microbiologist, food chemist, quality evaluation and control supervisor, plant foreman and manager, packing specialist, ingredients specialist, etc. The Model Curriculum of the Institute of Food Technologies was used as a guide in developing this curriculum. A special problem course provides opportunity for practical training in food processing plants and laboratories or federal and state laboratories.

#### Freshman

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Agriculture 1110-20-30-40-50</td>
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<td>Biology 1220</td>
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<td>Physics 1210-20</td>
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#### Sophomore

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<td>Agriculture 1120-20-30-40-50</td>
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<tr>
<td>Food Technology and Science 2200</td>
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<td>Mathematics 1540-50-60</td>
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<td>Physics 1210-20</td>
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#### Junior

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<td>Agricultural Mechanization 3510</td>
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<tr>
<td>Chemistry 3220, Nutrition 3320-39-39</td>
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<td>Food Technology and Science 3300</td>
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<td>Microbiology 3810</td>
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<td>Nutrition 3200</td>
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<tr>
<td>Plant and Soil Science 3610</td>
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</table>
Upon completion of the four-year forest resource management curriculum including the recreation option, the degree of Bachelor of Science in Forestry (B.S.F.) is awarded.

**Freshman**
- Botany 1120-20 or Biology 1210-20 8
- English 1010 or 1011; 1020; 1031 or 1032 or 1033 9
- Forestry 1620 3
- Forestry 3000 1
- Mathematics 1700, 1814-51 12
- Physics 1210 and 1220 or 2210 and 2220 8
- Speech 2311 4
- Electives 2-3

**Sophomore**
- Chemistry 1510-20 8
- Computer Science 1410 3
- Economics 2110-20 6
- Forestry 3000 3
- Forestry 3500 or Ornamental Horticulture and Landscape Design 3810 or Botany 3030 3-4
- Accounting 2110 or Political Science 3565 or 3566 3-5
- Sociology 1510 4
- Sociology 3110 or 3160 or Rural Sociology 3430 or Psychology 3120 3-4
- Psychology 2500 4

**Junior**
- Forestry 3210, 3310, 3420, 3520 13
- Wildlife and Fisheries Science 3230 3
- Plant and Soil Science 3610 3
- Forestry 3130 or Entomology and Plant Pathology 3140 or 3210 3-4
- Agricultural Mechanization 2120 3
- Speech 311 or 3211 or Journalism 3710 3-4
- Recreation 3140 3
- Electives 16

**Senior**
- Forestry 4120, 4210, 4230, 4240, 4330, 4440 20
- Planning 4100 3
- Ornamental Horticulture and Landscape Design 3610 4
- Forestry 4450 3
- Electives 16-21

**Total: 198 hours**

**Bachelor of Science in Wildlife and Fisheries**
- Ecological Management 3210, 3220 12
- Ecology 2210-20 or 2220 8
- Agriculture 1110 4
- Agriculture 1110 4
- Ag Science 2110-20 12
- Agricultural Science 3110, 3120 8
- Computer Science 3210 3
- Animal Science 3210 7
- Forestry 3000 1
- Plant and Soil Science 2130, 3610 7
- Electives 8-11

Students entering the junior year should check with adviser to assure completion of courses prerequisite to spring quarter junior field session.

**Freshman**
- Botany 1120-20 is recommended in lieu of botany for students interested in wildlife management.
- For or equivalent honors courses.
- 2Electives 10
- 3Computer Science 1410 is accepted in lieu of 1410 for those wishing to elect additional courses in this area.

**Total: 198 hours**

**Forestry, Wildlife and Fisheries**

Adviser: G. Schneider

The department offers two majors. The major in forestry leads to the degree Bachelor of Science in Forestry and the major in wildlife and fisheries science leads to the degree Bachelor of Science in Wildlife and Fisheries Science.

Forest Recreation-natural Forest Economics-economics, business administration, social sciences.

**Forest Resource Management Option**

The Forest Resource Management Option provides an opportunity to obtain an education related to the management of the broad spectrum of forest resources. In addition to the core of required courses there are about 30 elective credit hours for broad studies of specialized training in one or more areas of forestry. These areas and examples of related fields of study include:

- Forest Biology—plant physiology and morphology, ecology, genetics, tree nutrition, forest soils.
- Forest Business Management—economics, accounting, finance, marketing, management science.
- Forest Economics—business, administration, social science.
- Forest Engineering—mathematics, computer science, photogrammetry.
- Forest Inventory—mathematics, statistics, computer science, photography.
- Forest Recreation—natural and social sciences.

**Wildlife and Fisheries Science**

Wildlife and fisheries management is the science and art of maintaining populations of wild animals at levels consistent with the best interests of wild species themselves and of the American public. Management goals may be aesthetic, economic, or ecological. Success depends upon wildlife and fisheries biologists giving assistance in attaining the goals for which they strive; scholarly application of scientific information and methods to these goals; ecological perspective, and execution of programs to maintain past successes, to prevent repetition of past failures, and to prepare for future needs.

Upon completion of the four-year wildlife and fisheries science curriculum, the degree of Bachelor in Science in Wildlife and Fisheries Science is awarded.

**Freshman**
- Botany 1110-20 or Biology 1210-20 8
- English 1010 or 1011; 1020; 1031 or 1032 or 1033 9
- Forestry 1620 3
- Forestry 3000 1
- Mathematics 1700, 1814-51 12
- Physics 1210 and 1220 or 2210 and 2220 8
- Speech 2311 4
- Electives 2-3

**Sophomore**
- Chemistry 1510-20 8
- Computer Science 1410 3
- Economics 2110-20 6
- Forestry 3000 3
- Forestry 3500 or Ornamental Horticulture and Landscape Design 3810 or Botany 3030 3-4
- Accounting 2110 or Political Science 3565 or 3566 3-5
- Sociology 1510 4
- Sociology 3110 or 3160 or Rural Sociology 3430 or Psychology 3120 3-4
- Psychology 2500 4

**Junior**
- Forestry 3210, 3310, 3420, 3520 13
- Wildlife and Fisheries Science 3230 3
- Plant and Soil Science 3610 3
- Forest Science 3130 or Entomology and Plant Pathology 3140 or 3210 3-4
- Agricultural Mechanization 2120 3
- Speech 311 or 3211 or Journalism 3710 3-4
- Recreation 3140 3
- Electives 18

**Senior**
- Forestry 4120, 4210, 4230, 4240, 4330, 4440 20
- Planning 4100 3
- Ornamental Horticulture and Landscape Design 3610 4
- Forestry 4450 3
- Electives 16-21

**Total: 198 hours**

**Or equivalent honors courses.**

- Twenty hours of electives to be taken from the following courses: Agriculture 1110-20, 2210-20, 3510; Agricultural Biology 4020; Agricultural Economics 4330; Agricultural Mechanization 2130, 2490; Anthropology 2510-20; Astronomy 2110-20-30; Botany 3030, 3050, 3060, 3140; Business Law 4110; Civil Engineering 4260; Forestry 4220, 4340; Geology 4140-50, 4141; Ornamental Horticulture and Landscape Design 3210; Philosophy 2510-20; Plant and Soil Science 3250, Political Science 3565-66, 3630, 4940; Public Health 3210; Recreation 3100, 3200; Sociology 3910; Wildlife and Fisheries Science 4450, 4460, 4530; Zoology 3040, 4300.

- Computer Science 1510 is accepted in lieu of 1410 for those wishing to elect additional courses in this area.

**WILDLIFE AND FISHERIES SCIENCE**

Wildlife and fisheries management is the science and art of maintaining populations of wild animals at levels consistent with the best interests of wild species themselves and of the American public. Management goals may be aesthetic, economic, or ecological. Success depends upon wildlife and fisheries biologists giving assistance in attaining the goals for which they strive; scholarly application of scientific information and methods to these goals; ecological perspective, and execution of programs to maintain past successes, to prevent repetition of past failures, and to prepare for future needs.

Upon completion of the four-year wildlife and fisheries science curriculum, the degree of Bachelor in Science in Wildlife and Fisheries Science is awarded.
### Ornamental Horticulture and Landscape Design

**Adviser:** Professor Williams

Human needs go beyond food, clothing, and shelter. Nowadays, we also need a better environment, especially immediate surroundings. Ornamental plants and their uses are recognized as part of the environment, hence a curriculum in ornamental horticulture and landscape design. The four areas of study within this curriculum are floriculture, nursery management, turfgrass management, and landscape design. Each of these areas includes the science of producing flowering plants in field and greenhouse, and the art and science of using these plants for the benefit of humans. Opportunities are available as greenhouse managers, floral designers, retail salespersons, garden writers, research workers, and teachers.

Nursery management deals with the growing of trees, shrubs, and other ornamental plants for sale. Skills necessary to be a nursery manager include horticultural knowledge and a business sense. Students in this area are prepared to work in nurseries, garden centers, botanical gardens, and arboreta. They may find opportunities in research, teaching, writing, sales, and landscape management.

Turfgrass management includes all aspects of growing and caring for turfgrass, whether it be golf greens or home lawns. The increasing number of golf courses and home lawns and the emphasis on better quality make new opportunities for turfgrass managers. Such opportunities include golf course superintendents, park and recreational turf managers, operation of a lawn maintenance service, and producer and seller of sod, research, teaching, and sales.

Landscape design means modifying the outdoor environment for the greatest use, comfort, and enjoyment. It not only means the use of trees, shrubs, and other plant material to accomplish this goal, but it also means having an understanding of the requirements for working, recreation, and housing. Emphasis in the area of landscape design is on plant material and design courses. Opportunities in this area include landscape nursery operation, landscape maintenance, garden center operation, allied sales highway landscaping, park development, research, teaching, and writing.

### Plant and Soil Science

**Advisers:** Professors Reynolds, Seatz, Coffey; Associate Professors Allen, Lessman, and Reich

Plant and soil science deals with field and vegetable crops and soils. Plant science includes crop breeding and genetics for crop improvement and the introduction of new varieties, crop management for high quality products, and weed control for efficient crop production.

Soil science includes studies in soil formation and classification for better understanding of our soil resources; soil management for optimum crop production and conservation; soil fertility for utilizing fertilizers efficiently; and basic studies in chemistry, physics, and biology as they apply to the soil and to a better understanding of its properties and proper use.

The plant and soil scientist must have a knowledge of the basic physical and biological sciences and, in addition, be trained in communication skills. The scientist may be broadly trained or may specialize in a more specific field of the subject. Regardless of interest, many good jobs are available for the well-trained plant and soil scientist.

Employment opportunities differ depending upon the individual's type of training and interest. For the person who is scientifically inclined, positions are available in research with both public and private agencies. For those who wish to apply their knowledge to the solution of practical problems, positions are available with the Agricultural Extension Service as extension agents or as specialists, with the Soil Conservation Service, Forest Service, Farmers Home Administration, Production Credit Association, and other public agencies. Many plant and soil scientists are employed in private industry as technical specialists, supervisors, and salespersons. Banks and other financial institutions employ plant and soil scientists as appraisers and farm managers. Others may farm on their own, manage farms for others, or work in foreign agricultural programs. Certainly, plant and soil science is basic to all agriculture, and people trained in this important field will find many opportunities to serve in modern agriculture.

### Course Descriptions

#### GROUP A

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### TOTAL Credits

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#### TOTAL: 198 hours
Credit for Cooperative Work
A maximum of nine quarter hours of credit may be earned by supervised employment on approved jobs. To receive credit, the student must receive the recommendation of the employer, must present a satisfactory written report, and must receive a passing grade from the University professor in charge. Employment periods shall be not less than 12 weeks. At least one quarter must be spent in study on the campus between periods of employment. Prerequisites: Junior classification, with grade point average of 2.2 or above, and permission of the department head and the dean of the College of Agriculture to register. Three credit hours each quarter.

Short Courses and Special Events
Practical short courses in agriculture are offered for those who desire special training in certain fields. Some of these short courses are held on the Knoxville campus, others at the Buford Ellington 4-H Club Training Center, Milan, Tennessee, or appropriate research stations. The Resident Instruction, Research, and Extension staffs join in teaching these special courses annually, and others are offered to meet immediate needs for special instruction. These are service courses and do not carry college credit.

In-service training is provided special groups, such as the teachers of vocational agriculture, through short-term courses which are offered at convenient locations in the state. A special occasion known as Varsity Visit is held during the year. Delegates from all Future Farmers of America chapters are invited to spend a day on the agricultural campus with their advisers. Approximately 500 attend and inspect each department of the College.

Departments of Instruction
Interdepartmental Offerings

Agriculture (088)

1110 Introduction to Social Sciences for Agriculture.
1200 Introduction to Agricultural Engineering.
1300 Animal Science for Agriculture.
1400 Plant Science for Agriculture.
1500 Food Technology and Science in Agriculture.
4018 Honors: Seminar.

4110 Agricultural Industry Field Seminar (3) A travel study of the agricultural industry involving agricultural production, processing, marketing and services, and their interrelationships required. Prereq: Junior standing and permission of instructor.

Departmental Programs

Agricultural Economics and Rural Sociology

Professors: J. A. Martin (Head), Ph.D. Minnesota, N. B. Badenhop, Ph.D. Purdue, J. R. Brooker, Ph.D. Florida; D. W. Brown, Ph.D. Iowa State; C. L. Clandt, Ph.D. Wisconsin; Irving Dubov, Ph.D. California (Berkeley), J. L. Kells, Ph.D. Kansas; T. H. Kintz, Ph.D. Kentucky; F. O. Leuthold, Ph.D. Wisconsin; B. R. McManus, Ph.D. Purdue; B. H. Penrose, J. D. Tennessee; W. P. Rainey (Emeritus), Ph.D. Minnesota; C. B. Sappington, Ph.D. Illinois; T. J. Whately, Ph.D. Purdue.


Assistant Professors: W. M. Park, Ph.D. V.P.I. & S.U.; G. D. Whipple, Ph.D. Washington State.

Agricultural Economics (047)

2410 Economics of Food and Rural Resources (3) Analysis of contemporary problems and issues of public concern relating to food, agriculture, and rural areas using fundamental economic concepts. Farm income, food prices, world food problems, natural resources, environment, rural development.

3120 Agricultural Prices (3) Factors determining prices of farm products. Effects of price varying degrees and other factors. Sources of information on prices and related market data. Uses of price information and techniques of analysis in determining outlook for farm prices. Prereq: Agriculture 1110 and Economics 2120.

3320 Marketing Farm Products (3) American marketing system; alternative market structures, functions of marketing system, commodity marketing problems, current marketing problems, and possibilities for improvement. Prereq: Agriculture 1110 and Economics 2120.


5330 Land Economics (3) Problems and policies of land use, conservation, development, taxation, and tenure; population growth and demand for land; principles and theories of rent, property, value, and income. Prereq: Agriculture 1110 and Economics 2120.

5510 Advanced Land Economics (3) Study of the agricultural industry involving agricultural production, processing, marketing and services, and their interrelationships required. Prereq: Junior standing and permission of instructor.


5700 Agricultural Price Analysis (3) Principles of farm organization and operation; allocating land, labor, and capital to meet changing technologies; tenure arrangements; use of credit, risk; measures of success. Use and analysis of records; exercises in planning farms. Field trips arranged. Prereq: Agriculture 1110 and Economics 2120.

6500 Thesis

Institute of Agriculture
Professor: A. J. Sewell (Assistant Dean, Ag Experiment Station), Ph.D. Michigan State P. E.; C. H. Shelton, M. S. Virginia Polytechnic.

Associate Professors: J. A. Wray, Ph.D., Alabama State College; A. S. Wasson, Ph.D., University of Illinois; E. W. Brannen, Ph.D., University of Missouri.

Assistant Professors: D. O. Baxter, M. S. Missouri.

Agricultural Engineering (066)

1130 Introductory Agricultural Engineering (3) Basic engineering principles, field of agricultural engineering. 2 hrs. and 1 lab. Prereq: Open only to freshman and sophomore students in agricultural engineering.

3100 Seminar (1) Presentations, discussions, reports on research techniques. Prereq: Consent of department head.

3610 Soil and Water Conservation Engineering (4) Integration of hydrologic, agronomic, and engineering principles in solving agricultural water management problems involving food and erosion control, drainage, irrigation, and water quality. Coreq: Plant and Soil Science, 2130; Engr. Sci. and Mech. 3110, 3 hrs. and 1 lab. Graduate credit for non-majors only.

3620 Structures for Production, Environmental Control, and Waste Management (4) Design of systems and components for integrated agricultural processing considering mass and energy balances, product characteristics, equipment specifications, storage, handling, and economic merit. Prereq: 3630, 1 hr. and 2 labs.

4610 Design of Water Control and Waste Utilization Systems (3) Design of water control and waste utilization systems including earth dams, irrigation, drainage, land grading, hydraulic transport of wastes, and application of wastes on agricultural land. Prereq: 3610 or consent of instructor, 1 hr. and 2 labs.

5410 Agricultural Machinery System Analysis (3) Functional and operational characteristics of internal combustion engines and tractor systems; functional analyses and capabilities of agricultural machines; machinery system performance and cost analyses. Prereq: Engr. Sci. and Mech. 3700; Mech. Engr. 3311, 3 hrs. and 1 lab. Graduate credit for non-major only.

6410 Agricultural Supply Analysis (3) Development of systems and components for integrated agricultural processing considering mass and energy balances, product characteristics, equipment specifications, storage, handling, and economic merit. Prereq: 3630, 1 hr. and 2 labs.

6510 Instrumentation in Agricultural Systems (3) Functional and operational characteristics of internal combustion engines and tractor systems; functional analyses and capabilities of agricultural machines; machinery system performance and cost analyses. Prereq: Engr. Sci. and Mech. 3700; Mech. Engr. 3311, 3 hrs. and 1 lab. Graduate credit for non-major only.

6610 Selected Topics Agricultural Engineering (3) Development of systems and components for integrated agricultural processing considering mass and energy balances, product characteristics, equipment specifications, storage, handling, and economic merit. Prereq: 3630, 1 hr. and 2 labs.

5000 Thesis

5240 Environmental Control in Agricultural Structures (3) Development of systems and components for integrated agricultural processing considering mass and energy balances, product characteristics, equipment specifications, storage, handling, and economic merit. Prereq: 3630, 1 hr. and 2 labs.

5440 Instrumentation in Agricultural Systems (3) Functional and operational characteristics of internal combustion engines and tractor systems; functional analyses and capabilities of agricultural machines; machinery system performance and cost analyses. Prereq: Engr. Sci. and Mech. 3700; Mech. Engr. 3311, 3 hrs. and 1 lab. Graduate credit for non-major only.

5640 Research Problems in Agricultural Engineering (3) Selection, analysis, solution, and report of research problem. May be repeated for maximum of nine credit hours when engaged in approved industry work. Prereq: 3100 and consent of department head.

5710-20 Similitude in Design and Research (3,3) Fundamentals of graphics and mapping with emphasis on applications in agriculture and forestry. 1 hr. and 2 labs.

2130 Agricultural Surveying (3) Measurement of horizontal distances and angles; cartographic and photometric requirements; cartographic and photometric requirements; area computation. Prereq: Math 1560 or consent of instructor, 1 hr. and 2 labs.

2140 Forest Surveying (2) Instrumentation, methods, and computations used in determining distances, angles, elevations, and area related to forest management problems. Credit cannot be given for both 2120 and 2140. Prereq: Math 1560, 1 hr. and 1 lab.

3100 Seminar (1) Presentations, discussions, reports on research techniques. Prereq: Consent of department head.

3110 Agricultural Mechanics (3) Organizing, equipping, and managing school and farm shops; technical processes, materials, procedures in design and construction of shop projects; metal work and welding. 1 hr. and 2 labs.

3401 Forest Surveying and Mapping (3) Use of light detection methods of instruments including pacing, Abney level, topographic trailer tape, hand compass, and staff compass. Field measurements, computations and layouts involving random and true lines, traverses, topographic mapping, and forest roads. Prereq: 2140. Ten periods of 6 hrs. per period.

3210 Soil and Water Conservation Facilities (3) Leveling, topographic surveying, planning, construction, and maintenance of drainage, irrigation, and erosion control systems. Prereq: Math 1550, 2 hrs. and 1 lab.

3220 Agricultural Structures (3) Functional planning of structures; environmental control, construction methods, properties of building materials, and cost estimation. Prereq: Math 1560, 2 hrs. and 1 lab.

3510 Food Engineering Technology (4) Application of basic engineering principles of food processing: Fluid flow, heat transfer, refrigeration, drying evaporation, and materials handling. Prereq: Agriculture 1120 or Physics 1220. 3 hrs. and 1 lab.

3560 Electrical Systems in Agriculture (3) Electrical terms and fundamentals, distribution, wiring practice, governing codes, controls, and motors used in agricultural and residential facilities. Prereq: Physics 1220 or Agriculture 1120. 1 hr. and 1 lab.

4120-20 Seminar (1,1) Presentations, discussions, reports. 4120-Professional development topics. 4130—industry trip. Prereq: Consent of department head.

4160 Agricultural Waste Utilization and Disposal (3) Equipment, structures, and processes for utilizing, treating, and disposing of agricultural wastes by land spreading, lagoon, and processing. Prereq: Senior standing, 2 hrs. and 1 lab.

4170 Small Engines (3) Concepts and mechanics of small gasoline engines; selection, operation, adjustment, and repair of single cylinder engines. 2 hrs. and 1 lab.

4180 Equipment and Techniques for Application of Agricultural Chemicals (3) Equipment for application of liquid, solid, and gaseous chemicals; system components; operational characteristics; safety considerations; calibration; selection and management of application and disposal methods. 2 hrs. and 1 lab.

4210 Agricultural Machinery and Tractors (4) Agricultural machinery and power units; adaptation to agricultural and residential practices; field efficiencies, capacities, adjustment, and servicing. Prereq: Math 1550. 3 hrs. and 1 lab.

4220 Special Problems in Agricultural Mechanization (3) Selection, analysis, solution, and report of research problem. May be repeated for maximum of 9 credit hours when engaged in approved industry work. Prereq: 3100 and consent of department head.

4290 Forest Utilities and Roads (4) Electrical service and equipment, power sources, water supply, and sanitation systems emphasizing forest recreation facilities; planning, construction, and maintenance of forest roads, closets, and timber bridges. Prereq: 2130 or 2140. 3 hrs. and 1 lab.

5000 Thesis
Agricultural Extension Education (075)

Professor: G. C. McGhee, B.S. Tennessee.

1310 Introduction to Agricultural Extension (3)
History; philosophy; organization; teaching methods; relationships with other educational agencies.

1410-20 Field Studies (3,3) Supervised work experience with county extension agents in a designated county. For senior and graduate students. Prereq: 3110 and consent of instructor. Requires living off-campus for a specified time.

Graduate

5000 Thesis

5100 Special Problems in Agricultural Extension (1-4)

5210 Long-Range Extension Program Planning (3)

5220 Seminar (3)

5320 Evaluation in Programs of Agricultural Extension (3)

5310 History, Philosophy, and Objectives (3)

5320 Volunteer Leadership in Agricultural Extension Programs (5)

5330 Supervision of Agricultural Extension Programs and Personnel (3)

Animal Science (113)

Professors: D. O. Richardson (Acting Head), Ph.D. Ohio State; K. M. Barth, Ph.D. Rutgers; M. C. Bell, Ph.D. Oklahoma State; K. J. Blatcher (Emeritus), Ph.D. Ohio State; C. C. Chamberlain, Ph.D. Iowa State; O. G. Hall (Dean, College of Agriculture) Ph.D. Iowa State, S. B. Hansard (Emeritus), Ph.D. Florida; H. M. Jamison, Ph.D. Tennessee, Ph.D. Pennsylvania; E. R. Lidvall, M.S. Tennessee; J. B. McDowell, Ph.D. Auburn; M. J. Montgomery, Ph.D. Wisconsin; G. M. Merriman (Emeritus), D.V.M. Michigan State; R. L. Murphee, Ph.D. Wisconsin; H. W. Shidyak, Ph.D. B. R. Strode, Ph.D. Iowa State; E. W. Swanson, Ph.D. Missouri; R. L. Tugwell (Emeritus), Ph.D. Kansas State; C. E. Wylie (Emeritus), M.A. Missouri.


Assistant Professors: J. A. Comitt (Emeritus), Ph.D. Tennessee; R. N. Hellman, Ph.D. Maine; H. G. Kastles, Ph.D. VIP & SU; K. R. Robbins, Ph.D. Illinois; J. D. Smalhing, Ph.D. Texas A & M.


2610 Fundamentals of Food Animal Evaluation (4)
Criteria for food animal evaluation; market classes and grades of cattle, poultry, and pork products, lamb and wool, and swine; subjective and objective techniques for evaluation of beef cattle, dairy cattle, poultry, sheep, and swine. 2 hrs. and 2 labs.

2710 Introduction to Biometrical Aspects of Animal Science (3)
Introduction to concept of distributions. Expected values of variables as most probable values; Biometric and normal distributions and their prevalence in biological material. Planning effective experiments. Association or relationship of variables. Assessment of validity of hypotheses. 2 hrs. and 1 lab.

2810 Farm Animal Management Practices (3) In- tegration of management practices and skills into cattle, horse, sheep, poultry, and swine enterprises. Practices and skills include dehorning, castrating, docking, feeding, care, shearing, age determination, identification, preparing for show, immunizing and vaccinating, and controlling parasites. Facilities needed in livestock management including buildings, fences, corrals, equipment, skill and training, and restraining devices. 2-3 hrs.

2820 Introduction to Light Horses (3) Scope and role of light horse industry; breeds—development, function, and use; unsoundness; tack; introduction to management problems. May not be used by animal science majors to meet graduation requirements. 2 hrs. and 1 lab.

3210 Anatomy and Physiology of Farm Animals (4) Skeleton and joints, skeletal muscles, blood and microcirculation, and nervous cardiovascular, respiratory, digestive, renal, and endocrine systems; demonstration of physiocmhenical phenomena. Prereq: Biology 1210 or Agriculture 1360. 3 hrs. and 1 lab.

3220 Physiology of Reproduction (3) Comparative anatomy and physiology of reproductive systems of higher vertebrates; gamogenesis, fertilization, implantation, parturition, and involution of females; endocrine regulation of reproduction. Prereq: 3210 or consent of instructor. 2 hrs. and 1 lab. (Same as Zoology 3220).

3310 Introduction to Animal Nutrition and Feeding (3) Nutrient evaluation, function, and requirements of farm animals; animal feeds, nutrient content, and factors affecting feeding value; balancing rations for beef cattle, horses, sheep, swine, poultry, and laboratory animals. Prereq: 3320. 2 hrs. and 2 labs.

3320 Animal Nutrition (3) Properties, functions, utilization, and deficiency symptoms of essential nutrients; nutritive value of feeds. Prereq: Agriculture 1130 and one quarter of organic chemistry.

3330 Feeds and Ration Formulation (4) Feedstuffs, additives, feeding standards, nutrient requirements, and ration formulation for beef and dairy cattle, sheep, horses, swine, poultry, and laboratory animals. Prereq: 3320. 2 hrs. and 2 labs.

3410 Heredity in Animals (3) Basic chromosomal mechanism of heredity with emphasis on Mendelian principles and sex linkage and cytoplasmic inheritance. Introductions to biochemical basis of heredity and quantitative inheritance. Illustrations of principles related to species familiar to agricultural students. Prereq: Agriculture 1130. 2 hrs. and 1 lab.

3420 Principles of Animals Breeding (3) Genetic principles involved in breeding of economic species. Genetic basis of variation; Partitioning of variation according to various kinds of causative differences such as differences in general makeup and environment. Selection and consequences. Mating systems and effects on populations. Planning breeding programs. Prereq: 3410 or equivalent. 2 hrs. and 1 lab.

3430 Breeds of Farm Animals (3) Study of evolution and formation of breeds of cattle, horses, poultry, sheep, and swine. Breeding structure. History, development, characteristics, and improvement programs of various breeds. Prospects for purebred industry and impact of crossbreeding programs. 2 hrs. and 1 lab.

3510 Animal Hygiene and Sanitation (4) Parasitic, viral, and bacterial organisms in farm animals, immunization; control and protection against disease; veterinary regulations and quarantine; administration of drugs. Prereq: Microbiology 2910-11 or 2910-19 or consent of instructor. 3 hrs. and 1 lab.

3520 Avian Diseases (3) Major diseases; characteristics, prevention and treatment, management procedures and systems for domestic birds, upland game birds and water fowl. 2 hrs. and 1 lab.


3620 Dairy Cattle Judging and Classification (3) Comparative judging of dairy cattle; type classification programs. Economic value of classification ratings. Prereq: 2610 or consent of instructor. 3 labs.

3630 Poultry Products (3) Grading of poultry and poultry products, according to USDA standards; factors influencing quality. Prereq: Consent of instructor. 1 hr. and 2 labs.

3640 Horse Selection and Judging (3) Selection, judging, evaluation of soundness and scoring of working and pleasure horses for functional efficiency. Prereq: Consent of instructor. 1 hr. and 2 labs.

3650 Nutrition and Management of Laboratory Animals (3) Principles of feeding, breeding, and handling of animals in scientific investigations; special species' requirements, peculiarities, and research for which best fitted; laws governing use and handling of laboratory animals. Prereq: Agriculture 1130 and consent of instructor. 2 hrs. and 1 lab.

4110 Special Problems in Animal Science (1-4) Special problems or special reports based on supervised independent study or review of literature dealing with subjects applicable to field of animal science; approved supervised work experiences in state-federal laboratories or in private industry. May be repeated for a maximum of 8 credit hrs. Prereq: Senior standing and consent of instructor and department head.

4210 Physiology of Lactation (3) Development, anatomy, and function of mammary glands; endocrine interactions for mammary development and milk secretion; factors affecting yield and composition of milk. Prereq: 3210.

4220 Avian Physiology (3) Anatomy and physiology of avian species with emphasis on poultry. Prereq: 3210. 2 hrs. and 1 lab.

4330 Feeding Applications for Farm Animals (3) Detailed application of feeding principles designed to allow students to discover and explore feeding options available to producers through problem solving. Prereq: 3330. 1 hr. and 2 labs.

4340 Experimental Animal Nutrition Laboratory (2) Laboratory feeding trials to demonstrate the basic animal nutrition concepts and the application of knowledge of feeding of experimental diets. Prereq: 3330. 2 labs.

4410 Applied Animal Breeding (3) Applications of principles studied in 3420. Team taught by specialists in breeding of dairy cattle, meat livestock, poultry, and swine. Prereq: 3420. 2 hrs. and 1 lab.

4610 Advanced Beef Cattle, Dairy Cattle, Horse Poultry, Sheep, and Swine Judging (2) Specialization in judging, evaluation, selection, and presentation of oral reasons on classes of beef cattle, dairy cattle, horses, poultry, sheep, and swine. May not be repeated for credit. Prereq: Consent of instructor. 2 labs.
economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs. and 1 lab.

4830 Pork Production and Management (4) Integration of principles of selection, nutrition, breeding, physiology, and marketing into complete pork production program. Topics will include structure of industry, enterprise establishment, systems of production, production practices, and herd improvement programs. Alternatives evaluated in terms of production responses and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs. and 1 lab.

4840 Poultry Production and Management (4) Structure of poultry industry; organization and management of poultry enterprises including rearing, housing, feeding, processing, and marketing. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs. and 1 lab.

4850 Light Horse Production and Management (4) Integration of principles of nutrition, physiology, and breeding into light horse management program. Topics include structure of industry, systems and practices of production; individual animal and herd improvement programs; tack, equipment, and facilities for both pleasure and commercial producers. Alternatives evaluated in terms of pleasure, recreation, and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs. and 1 lab.

4860 Lamb and Wool Production and Management (4) Integration of principles of selection, nutrition, creation, and marketing into complete lamb and wool production program. Topics will include structure of industry, enterprise establishment, systems of production responses, and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs. and 1 lab.

4910 Seminar (2) Review of literature and presentations on special topics and current research in animal science field. Prereq: Senior standing. 1 hr. and 1 lab.

GRADUATE

5000 Thesis

5011 Problems in Lieu of Thesis (1-6)

5110 Special Problems in Animal Science (1-6)

5210 Endocrine Relations in Animal Production (4)

5220 Advances in Mammalian Reproduction (3)

5240 Advanced Studies of the Secretion of Milk (3)

5311 Analytical Techniques in Animal Nutrition (3)

5322 Advanced Experimental Animal Nutrition (3)

5333 Nonruminant Animal Nutrition (4)

5344 Ruminant Animal Nutrition (3)

5410 Genetics of Animal Populations (3)

5510-20 Advanced Animal Physiology (5, 5)

5710 Methods of Evaluating Experimental Data in Animal Science (3)

5720 Design and Interpretation of Experiments in Animal Science (3)

5910 Seminar (1)

6000 Doctoral Research and Dissertation

6150 Topics in Milk Constituents (3)

6160 Topics in Dairy Microbiology (3)

6210 Advanced Topics in Animal Physiology (1-6)

6220 Environmental Physiology of Farm Animals (3)

6230 Animal Growth and Development (3)

6240 Physiology of the Heart (4)

6311 Advanced Topics in Animal Nutrition (1-6)

6322 Advanced Animal Nutrition (3)

6411 Advanced Topics in Animal Breeding (1-6)

6420 Animal Breeding Research Methods and Interpretation (3)

6611 Advanced Topics in Animal Products (1-6)

Seminar (1)

Entomology and Plant Pathology (341)

Professors:


3130 Plant Pathology (4) Principles of plant pathology illustrated by diseases of common agricultural crop plants. Prereq: Botany 1120 or Biology 1220. 3 hrs. and 1 lab. (Same as Botany 3130.)

3140 Forest Pathology (4) Ecology, recognition, economic impact, and control of forest tree diseases, including wound decay and other diseases important to urban forestry and forest nurseries. Prereq: Botany 1120 or Biology 1220 or equivalent. 3 hrs. and 1 lab. No credit if 3130 previously taken.

3210 Economic Entomology (4) Structure, life history, habits, and principles of control of important insect pests of farm, garden, orchard, and household. 3 hrs. and 1 lab.

3220 Apiiculture (3) Biology of the honey bee, with emphasis on beekeeping equipment and apiary management practices relative to pollination of crops and production of honey and beeswax. 2 hrs. and 1 lab.

4010 Biology of Soil Microorganisms (4) Morphology and physiology of soil organisms, decomposition of organic matter, chemical transformations, and interactions between soil organisms and higher plants. Prereq: 3130 or introductory microbiology. 3 hrs. and 1 lab. (Same as Microbiology 4010.)

4030 Forest and Shade Tree Entomology (3) Identification, biology, ecology, and control of forest and shade pests. Prereq: 3210 or equivalent. 3 hrs. and 1 lab.

GRADUATE

5000 Thesis

5010 Research Methods and Instrumentation in Plant Pathology and Entomology (3)

5110 Plant Disease Diagnosis (3)

5120 Insect Diagnostic Clinic (3)

5210 Plant Parasitic Nematodes (4)

5220 Plant Disease Control (3)

5230 Field Crop and Vegetable Insects (3)

5240 Plant Virology (4)

5250 Medical and Veterinary Entomology (4)

5260 Insect Pest Management (4)

5310 Special Problems in Entomology (1-6)

5320 Special Problems in Plant Pathology (1-5)

5330 Special Problems in Nematology (1-6)

5410 Seminar (1)

Food Technology and Science (390)

Professors:

J. T. Miles (Head), Ph.D. Wisconsin; J. L. Collins, Ph.D. Maryland; T. B. Harrison (Emeritus), M.S.A.

Tennessee; H. O. Jaynes, Ph.D. Illinois; C. C. Melton, Ph.D. Kansas State; W. W. Overcast, Ph.D. Iowa State.

Associate Professors:

B. J. Demott, Ph.D. Michigan State; S. L. Melton, Ph.D. Tennessee; R. J. Niemann, Ph.D. Kansas State.

Assistant Professors:

P. M. Davidson, Ph.D. Washington State; F. A. Draughon, Ph.D. Georgia; J. R. Mount, Ph.D. Ohio State.

Instructor:

O. G. Sanders, M.S. Tennessee.

2200 Food Processing I (3) Introduction to art and sciences of manufacturing food products. 2 hrs. and 1 lab.

3020 Dairy Products I (4) Procurement, processing, and distribution of liquid milk. Manufacture of frozen and condensed dairy products. 3 hrs. and 1 lab.

3300 Food Laws and Regulations (3) State and federal laws concerning food industry. Organization and operation of regulatory agencies. Food grades and standards. Prereq: Agriculture 1150 or 2200 or equivalent.

3570 Evaluation and Grading Dairy Products (3) Market standards and grades of dairy products with practice in grading milk, ice cream, butter, cheese, and other specialized dairy products. 1 hr. and 2 labs.

3610 Meat Evaluation and Grading (3) Grading standards for quality and quantity and principles of evaluating beef, pork, and lamb. Practice in grading and judging carcasses and cuts. 1 hr. and 2 labs.

3840 Meat Science (3) Processing methods, carcass characteristics of meat animals; slaughter, cutting, selection, curing, freezing, and cooking. 2 hrs. and 1 lab.

4000 Problems in Food Technology (1-4) Research problems in student's area of interest. Required written report. Supervised experience in state or federal laboratories or approved industries encouraged. May be repeated. Maximum 9 credit hrs. Prereq: Consent of department head.

4010 Food Technology and Science Seminar (1-3) Review of literature, oral and written reports. May be repeated for a maximum of 3 credit hrs. Prereq: Junior standing and consent of instructor.

4030 Dairy Products II (4) Principles in the manufacture of butter, cheese, and specialty dairy products. Prereq: 3020. 3 hrs. and 1 lab.

4130 Food Chemistry I (3) Minerals, fats, oils, and vitamins in food as affected by processing and storage. Prereq: Nutrition 3320 or equivalent. 2 hrs. and 1 lab.

4140 Food Chemistry II (3) Reactions of proteins, carbohydrates, and natural food colorants in food materials. Protein structure, food enzymology, and browning reactions. Effects of storage and processing on proteins and carbohydrates with emphasis on nutritional value and functionality. Prereq: Nutrition 3320 or equivalent. 2 hrs. and 1 lab.

4200 Food Processing II (4) Prevention of deterioration and spoilage of foods. Methods of preservation and packaging. Prereq: 2200 and Agriculture Mechanization 3510. 3 hrs. and 1 lab.

4210 Food Additives (3) Substances used in food manufacturing with emphasis on properties and functions. Prereq: Nutrition 3320 or equivalent.

4230 Food Processing III (3) Water, sanitation, and waste control as applied in food industry. Prereq: Agriculture 1150 or Microbiology 2910-19 or equivalent.

4410 Food Crop Products (3) Food products from crops with emphasis on types, manufacturing systems, quality attributes, and utility.

4420 Bakery Products (3) Baking ingredients and their interactions during production and storage of bakery products. Prereq: Food Technology and Sci-
1620 Introduction to Forestry (3) History of forestry; establishment, care, protection, and use of forest stands; forest products industries; organization and administration. Prerequisites: 4 credits in sociology and/or economics. Junior standing. 2 hrs. and 1 lab.

4020 Field Methods of Timber Inventory (4) Field measurement of forest trees; timber cruising; determining appropriate sample design for specific purposes, tree and stand growth; site evaluation; field procedures. Prereq: 3110 and Agricultural Mechanization 3140.

4040 Forest Practice (3) Management of forest lands by public and private organizations; "multiple-use" concepts; influences management decisions; impact of public pressure for outdoor recreation or management decisions; management prescriptions. Prereq: 4006. S/NC.

4040 Silvicultural Methods (4) Methods and application of forest practice; an introduction to forest site preparation, planting and seeding, modifications of cutting methods to conform to desired goods and benefits. Prereq: 3330, 4900. 4006. 2 hrs. and 1 lab.

4020 Forest Watershed Management (3) Water as a forest resource; role of forests in the hydrologic cycle; control of water quantity, quality, and regimen; watershed planning. Prereq: 3330 or consent of instructor. 3 hrs. Two overnight field trips.

4110-30 Problems in Forestry (1-6, 1-4, 1-6) Special research or individual problems in forestry. Prereq: Senior standing. Total not more than 9 hrs.

4210 Forestry Organization and Administration (3) Planning, organization, and administration of forest resource management. Prereq: Senior standing in forestry or wildlife and fisheries science or consent of instructor. 2 hrs. and 1 lab.

4220 Forest Resource Management (4) The forest as an economic system; management of forest resources; current policies influencing development of forest enterprises; production and development of forest products; watershed and wildlife; producing multiple services; preparation of a complete plan based on optimizing forest uses. Prereq: 4210.

4240 Interpreting Forest Resources (3) Principles and techniques of interpreting forest resources; importance of environmental interpretation to management of forest resources; development and administration of interpretative services. Possible overnight field trips required. Prereq: 3240 or equivalent. 2 hrs. and 1 lab.

4330 Forest Policy (3) History of forestry in the United States; current forest resource or policy; principles of forest resource policies; current policies influencing development and management of forest resources; brief survey of policy implications on development of forest organizations in public and private sectors. Prereq: 4004.

4340 Aerial Photography in Forest-Resource Management (3) Use of conventional aerial photographs in forest-resource management; interpretation of detail, aerial inventories, preparation of cover-type maps, uses of other remotely sensed imagery. Prereq: 3110 or equivalent. 1 hr. and 2 labs.

4420 Forest Tree Improvement (3) Forest tree improvement related to silviculture; nature and purposes of tree improvement and forest genetics; principles of tree physiology and population genetics; theories of seed source; variation, selection of superior phenotypic types, and development of seed orchards; hybridization, selection, forest genetics; principles of seedling improvement. Prereq: 4006 or consent of instructor. 2 hrs. and 1 lab.

4430 Regional Silviculture of the United States (3) Factors that influence silvicultural management of important tree species in North America. Importance of forests and forestry to a region; physiography, geology, soils, climate and weather, sites and site types, ecology, problems of protection, and silvicultural characteristics of the more important species. Prereq: 4006 or consent of instructor.

4440 Forest Recreation (3) Forest lands as a recreation resource; interrelationships of forest recreation and other forest management functions; interpretation of detail, management of forest recreation areas; socioeconomic and political determinants of recreation development and management. Prereq: 3100 and Agricultural Mechanization 3140.
4450 Recreational Behavior in Forest Environment (3) Review of sociological and psychological theories relevant of forest recreation planning, management, and administration. Implication and application of behavioral concepts to forest recreation problems, and review of methodologies for assessing recreational behavior. Prereq: 3240 and 6 hrs. in behavioral psychology and/or sociology, or consent of instructor. 3 hrs.

4540 Wood Drying and Preservation (3) Concepts of wood drying including wood-moisture relations, specific gravity, moisture content, density, and shrinkage. Discussion of commercial drying practices. Relationship of wood moisture content to attack by wood destroying organisms. Methods and materials used in commercial heating systems. Prerequisites: 3120, Math 1851, Physics 1220 or consent of instructor.

GRADUATE

5000 Thesis

5002 Non-Thesis Graduation Completion (3-15)

5011 Problem Analysis in Forest Resources (3)

5110 Special Problems in Forestry (1-4)

5220 Seminar in Forest Tree Biology (3)

5230 Seminar in Forest Management (3)

5240 Seminar in Forest Genetics (3)

5250 Recreation Planning for Forests and Assessed Lands (3)

5260 Industrial Forestry (3)

5270 Topics in Forest Industries Management (3)

5280 Seminar in Forest Biometry (3)

5310 Seminar (1)

Wildlife and Fisheries Science (933)

3000 Current Events in Renewable Natural Resources (1) Current events influencing forestry, wildlife, and fisheries science. Perspectives from other disciplines and professions which are affected by and which influence natural resource management. Extended view of natural resources, their allocation and management. Professional development and education for the disciplines of forestry, wildlife, and fisheries science. 1 hr. May be repeated. Maximum credit 4 hrs. S/NC. (Same as Forestry 3000.)

3200 Wildlife Resources and Their Conservation (3) Wild animal resources of the United States; their impact on outdoor recreation; forest and wildlife; and other plant life; contribution to economic and social development; importance and methods of conserving wildlife. General course for non-wildlife and fisheries science majors only.

3230 Wildlife Management (3) Lives and ecological relationships of wild animals; biological, social, and economic aspects of their management. Available for graduate credit for non-forestry and non-wildlife and fisheries science majors only.

4450 Game Mammals (4) Classification, identification, distribution, natural history, and management principles of game mammals in North America. Prereq: 3220 or one year of zoology. 2 hrs. and 2 labs.

4460 Game Birds (4) Biology, classification, identification, distribution, and management of game birds in the southern United States, and other plant life; contribution to economic and social development; importance and methods of conserving wildlife. General course for non-wildlife and fisheries science majors only.

5000 Thesis

5110 Special Problems in Wildlife and Fisheries Science (1-4)

5210 Seminar in Wildlife Conservation (3)

5310 Seminar (1)

5400 Advanced Topics in Wildlife Science (3)

5450 Wildlife Diseases (3)

5460 Predator Ecology (3)

5500 Advanced Topics in Fisheries Science (3)

5550 Fish Physiology (3)

Ornamental Horticulture and Landscape Design (740)

Professors: D. B. Williams (Head), Ph.D. Pennsylvania State; L. M. Caitham, Ph.D. Rutgers; N. D. Peacock (Emeritus), Pennsylvania State.


Instructor: E. L. Abbott, MS Tennessee.

2230 Environmental Horticulture (3) An introduction to awareness and appreciation for ornamental plants around and in the home. Design and management of home landscapes including selection, buying, effectively using, planting and caring for trees, shrubs, turfgrasses, herbaceous landscape plants and house plants. 3 hrs.

3030 Plant Propagation (3) Physiology, methodology, and environmental requirements for propagation. Prereq: 6 hrs. of biological science. 2 hrs. and 1 lab.

3040 Floral Design (3) Principles and techniques in the production of minor cut flowers and potted plant displays. Prereq: Junior standing and consent of instructor. 1 hr. and 2 labs.

3110 Greenhouse Management (3) Factors involved in management of greenhouse for production and research. Structure, soil, pest control measures, heating, ventilating, lighting, water supply, crop succession. Prereq: Junior standing and consent of instructor. 2 hrs. and 1 lab.

3210 Turfgrass Management (4) Practical turf-grass management; cultivar selection, identification, and establishment; basic applied fertilizer programs, mowing and irrigation practices, and thatch control; pest identification and control. Prereq. Plant and Soil Science 2130 and 8 hrs. biological sciences. 3 hrs. and 1 lab.

3310 Professional Practices in Ornamental Horticulture (3) Application of management and marketing practices for greenhouses, nurseries, flower shops, garden centers, plant stores, and landscaping firms. Investigating of practices and the solution of problems as they relate to the students' areas of interest in the establishment and operation of floricultural, nursery, landscape planning and maintenance enterprises, including compliance with governmental regulations and other operational practices specific to the ornamental horticulture industry. 3 hrs.

3410 Basic Floriculture (3) Principles and practices employed in producing major cut flowers and potted plant crops. Application of principles of plant physiology as they relate to the control of flowering, harvesting schedule, and post-harvest quality. Prereq: 3110, and Plant and Soil Science 3240 or equivalent. 2 hrs. and 1 lab.

3510 Grounds Maintenance and Management (4) Identification of landscape maintenance tasks; growth control, irrigation, soil amendments, transplanting, cultivation, pest management, pest control, less 2310, 6 hrs. and 2 labs.

3610 Fundamentals of Landscape Design (4) Development of basic graphic skills and techniques of plan delineation. Fundamentals of the process theory of design, site analysis, program development, design synthesis, introduction to regional geographic interpretation, landscape construction materials and landscape structures. Development of awareness and sensitivity to landscape elements. 1 hr. and 2 three-hour labs.

3620 Intermediate Landscape Design (4) Application of skills and knowledge acquired in 3610 to a variety of landscape projects. Refinement of graphic skills. History of landscape design as it relates to contemporary applications. Technical aspects of planting design and implementation. Use of plant materials in designing small to moderate scale landscape situations. Prereq: 3610, 3810 or equivalent. 1 hr and 2 three-hour labs.

3630 Landscape Construction and Contracting (4) Application of construction practices concerned with landscape installation and contracting. Site layout procedures, earthwork and drainage, landscape construction materials; application through detailed design drawings and small scale projects. Landscape contracts, specifications and bidding procedures. Prereq: 3610. Ag. Mech. 2320 recommended. 1 hr and 2 three-hour labs.

3810 Basic Landscape Plants (4) Identification, classification, adaptation, culture, and landscape design uses for basic ornamental trees, shrubs, and vines. Prereq: 8 hrs. of botany or biological science and Agriculture 1140. 2 hrs and 2 labs.

3820 Supplementary Landscape Plants (3) Identification, classification, adaptation, culture, and landscape design uses for foliage and flowering plants. Prereq: 3810. 1 hr and 2 labs.

3830 Interior Plants (3) Identification, classification, adaptation, culture and interior uses for foliage and flowering plants. 1 hr. and 2 labs.

4150 Nursery Production (4) Modern methods of producing liners, field and container grown woody ornamental plants. History and evolution of nursery industry and modern production recommendations for woody ornamental plants. Prereq: Plant and Soil Science 2130, 2 hrs and 2 labs.

4160 Nursery Management (3) Modern management methods for wholesale and retail nurseries, garden centers, and landscape contractors. Prereq: 3310. 2 hrs. and 1 lab.

4180 Park Design (4) Design criteria for parks and outdoor recreation systems. Park site selection; analysis, planning, and management as related to needs and natural and economic resources. Evaluation of aesthetic and functional quality of parks and their impact on environmental quality of rural and suburban communities. Prereq: 3620. 2 hrs. and 2 labs.

4190 Advanced Landscape Design (4) Comprehensive evaluation of landscape design skills and knowledge through the development of a major project. Analysis, planning, and programming, design construction detailing, estimating, contracts, and accounting included in total package project. Prereq: 3510, 3620, 3630. 1 hr and 2 three-hour labs.

4220 Advanced Turfgrass Management (4) Principals and scientific basis of turfgrass; growth control, irrigation, soil fertility, and grass nutrition; climatic influences on grass culture, physiology of clipping, and water management; traffic effects and compaction; and the physiological influences of pest infestations and control measures. Prereq: 3210. 3 hrs. and 1 lab.

4320 Specialty Floriculture (3) Specific practices in the application of minor cut flowers and potted plant crops. Production methods for scheduling flowering or
vegetative growth of specialty florist crops in controlled environments. Prereq: 3410. 2 hrs and 1 lab.

4400 Individual Problem Study (1-5) May be repeated to maximum of 10 credit hrs.

4610 Seminar (1) Current problems in ornamental horticulture and landscape design. Prereq: Junior standing and consent of instructor.

GRADUATE

5000 Thesis

5100 Special Problems in Ornamental Horticulture and Landscape Design (3)

5210 Golf Course Design, Development, and Management (4)

5310 Park and Public Grounds Management Systems (4)

5410 Histological Microtechnique (4)

5500 Seminar (1)

Plant and Soil Science (792)

Professors: L. F. Beatz (Head), Ph.D. North Carolina State; F. B. Carson, Ph.D. Ohio State; W. L. Parks, Ph.D.; J. H. Reynolds, Ph.D. Wisconsin; L. N. Skold, M.S. Kansas State; M. E. Springer (Emeritus), Ph.D. California (Berkeley); H. D. Swingle (Emeritus), Ph.D. Louisiana State.


Assistant Professors: D. E. Dayton, Ph.D. North Carolina State; W. J. McLaurin, Ph.D. Louisiana State; R. J. Miles, Ph.D. Texas A&M; D. H. West, Ph.D. Nebraska; J. D. Wott, Ph. D. Auburn.

3120 Soils (4) Nature and properties of soils. Physical, chemical, biological processes in soils and their influence on plant growth. Prereq: Chemistry 1120 or 1250 or 1620. 3 hrs. and 1 lab.

3020 Crop Ecology (3) Crops and environment; geographic location; site, heat, light, water, and interplant relationships as a basis for judgment of cultural practices used to modify environmental factors. Prereq: 8 hrs. biological science. 2 hrs. and 1 lab.

3040 Crop Physiology (3) Physiology of crop plants; growth phenomena related to crop production; use of general theories of physiology; effects of season, growth regulating substances, functions of light, heat, air, minerals, and water. 2 hrs. and 1 lab. Prereq: 8 hrs. biological science.

3110 Soil Fertility and Fertilizers (4) Properties of soils in relation to plant nutrient availability and uptake. Methods of soil fertility evaluation and principles of fertilizer use; manufacture and properties of fertilizers. Prereq: 2130. 3 hrs. and 1 lab.

3120 Grain and Oil Crops (3) Distribution, improvement, morphology, culture, harvesting, and utilization of corn, small grains, grain sorghum, soybeans, and related crops. Prereq: 2130; 8 hrs. biological science. 2 hrs. and 1 lab.

3140 Forage Crops (4) Characteristics, adaptation, improvement, management, and utilization of grasses and legumes for pastures, hay, and silage. Prereq: 2130; 8 hrs. biological science. 3 hrs. and 1 lab.

3160 Cotton and Tobacco (4) Characteristics, adaptation, improvement, culture, harvesting, and marketing of cotton and tobacco. Prereq: 2130; 8 hrs. biological science. 3 hrs. and 1 lab.

3180 Fruit Crops Management (4) Soils, planting, cultivation, development of fruit crop plantations; pest control, harvesting, packing, storage and pruning. Prereq: Ent. & P. Path. 3210, 3150; 3 hrs. and 1 lab.

3220 Soil Management (4) Soil management for crop production including cropping systems, fertilizer use, and tillage operations for specified soil and farming conditions. Prereq: 2130; 3 hrs. and 1 lab.

3250 Soils in Forestry (3) Soil as a medium for tree growth; relation of physical, chemical, and biological properties of soils to tree growth and management of forest stands. Soil properties of importance in road location, recreational development, and watershed management. Prereq: 2130; Forestry 3320. 2 hrs and 1 lab.

3510 Commercial Production of Cool Season Vegetables (3) Characteristics, economic importance, adaptability, and production for fresh and processing markets; emphasis on greens, salad, cole, root, bulb crops, perennial and leafy vegetables. Prereq: 8 hrs. biological science. 2 hrs. and 1 lab.

3520 Commercial Production of Warm Season Vegetables (3) Characteristics, economic importance, adaptability, and production for fresh and processing markets; emphasis on sweet potatoes, beans, tomatoes, pepper, cucurbits, sweet corn, and okra. Need not have 3510 as prerequisite. Prereq: 8 hrs. biological science. 2 hrs. and 1 lab.

3540 Soil Physics (3) Soil formation; properties, distribution, and behavior of colloidal soil materials; relations of chemical properties to plant nutrient availability. Prereq: 2130; Physics 1210. 3 hrs. and 1 lab.

3710 Principles of Weed Science (4) Basic principles of weed science, history, ecology, economic losses, means of control of weeds, and specific recommendations for non-crop and non-crop. Prereq: 8 hrs. biological science and 3 hrs. organic chemistry. 3 hrs. and 1 lab.

4110 Soil Chemistry (4) Colloidal systems; properties and behavior of colloidal soil materials; relations of chemical properties to plant nutrient availability. Prereq: 2130, Physics 1210. 3 hrs. and 1 lab.

4120 Principles of Crop Breeding (4) Genetic principles and techniques used in crop improvement. Prereq: 8 hrs. biological science or consent of instructor. 3 hrs. and 1 lab.

4250 Agricultural Chemicals and the Environment (4) Characteristics, use, mode of action, degradation, and environmental impact of chemicals used in agriculture; forestry; and related areas with emphasis on agricultural pesticides; environmental safeguards imposed by federal and state regulations on chemical development and use. Prereq: One year biological science and one year chemistry. 3 hrs. and 1 lab.

4320 Soil Formation, Morphology, and Classification (4) Soil formation; properties, distribution, and classification of soils; interpretation of morphology, use of soils surveys. Prereq: 2130; 3 hrs. and 1 lab.

4400 Problems In Plant and Soil Science (1-6) Special research or library problems in some phase of plant and soil science. May be repeated. Maximum credit 9 hrs.


GRADUATE

5000 Thesis

5100 Special Problems In Plant and Soil Science (1-6)

5200 Soil-Crop Relationships (3-5)

5240 Soil Productivity and Management (3)

5950 Pedology (4)

5310 Design and Interpretation of Experiments (4)

5340 Soil Physics (3)

5370 Advanced Soil Fertility (3)

5390 Soil Physical Chemistry (3)

5500 Seminar (1)

5710 Advanced Plant Genetics (3)

5720 Quantitative Genetics (3)

5750 Advanced Plant Breeding (4)

5810 Crop Climatology (4)

5820 Advanced Crop Physiology and Ecology (4)

5850 Mechanisms of Herbicide Action (3)

6000 Doctoral Research and Dissertation

6100 Special Topics In Soil Science (3)

6200 Special Topics Plant Breeding (3)

6300 Special Topics in Crop Physiology and Ecology (3)

6410 Experimental Designs (3)

6510 Growth Control with Chemicals (3)

6600 Seminar (1)

College of Veterinary Medicine

Hyram Kitchen, Dean
C. F. Reisch, Jr., Associate Dean
W. H. Grau, Jr., Associate Dean

The College of Veterinary Medicine, established in 1974, offers a professional curriculum leading to the degree Doctor of Veterinary Medicine (D.V.M). The College offers graduate studies leading to the degrees Master of Science (M.S.) and Doctor of Philosophy (Ph.D.). Residency training programs in the various clinical specialties are also offered.

The College is organized into six academic departments: Animal Science (jointly with the College of Agriculture), Environmental Practice, Microbiology (jointly with the College of Liberal Arts), Pathobiology, Rural Practice, and Urban Practice.

Primary objective of the College is to educate veterinarians for private practice. However, the professional curriculum provides an excellent basic medical education, in addition to training in diagnosis, disease prevention, medical treatment, and surgery. Graduates are qualified to pursue careers in many facets of veterinary medicine and related health professions.

Most veterinarians are engaged in private practice. The majority of these are in general practices which deal with the diseases of all kinds of animals. About one-fourth of the veterinarians in the United States are engaged exclusively in pet or companion animal practice. A growing number are concerned with the health problems of zoo animals, laboratory animals, wildlife, and aquatic species.

Veterinarians also find rewarding careers in the U.S. Public Health Service, the U.S. Army and Air Force, and in state, county, or local health agencies. A large number of veterinarians are employed by the U.S. Department of Agriculture and by state departments of agriculture for important work in livestock disease control, meat and poultry inspection, serum and vaccine production, and the protection of our country against the importation of foreign animal diseases.
Excellent opportunities exist for veterinarians interested in research both for the direct benefit of animals and for research conducted with animals but for the benefit of humans. Such opportunities are available at colleges and universities, and with governmental agencies, private research institutions, and biological and pharmaceutical companies.

Facilities
Administrative offices of the College of Veterinary Medicine are located at the University. The Department of Animal Science is housed on the Agricultural Campus, and the Department of Microbiology is located in Watters Life Sciences Building on "The Hill" of The University of Tennessee, Knoxville.

The College has research facilities on Cherokee Farm adjacent to the UT Hospital. Satellite teaching-research facilities are located in Middle and West Tennessee.

Admission Requirements
Admission to the professional program of the College of Veterinary Medicine is limited to that number for which an education of high quality can be provided with the resources available to the College.

To qualify for admission a candidate must have completed at least the minimum pre-veterinary requirements:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Minimum Credits</th>
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<tbody>
<tr>
<td>English, including speech</td>
<td>12</td>
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<tr>
<td>Humanities</td>
<td>12</td>
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<tr>
<td>Social sciences</td>
<td>12</td>
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<tr>
<td>Mathematics through introductory</td>
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<tr>
<td>calculus</td>
<td>6</td>
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<tr>
<td>Chemistry: general</td>
<td>12</td>
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<td>organic</td>
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<td>biochemistry</td>
<td>6</td>
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<td>Physics</td>
<td>12</td>
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<tr>
<td>Biology or zoology</td>
<td>12</td>
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<tr>
<td>Microbiology</td>
<td>4</td>
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<tr>
<td>Animal science, including nutrition and antinutrition</td>
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EXTRA CURRICULAR REQUIREMENTS
Medical communication, professional ethics, jurisprudence, economics, and practice management.

FIRST YEAR
<table>
<thead>
<tr>
<th>Fall Quarter</th>
<th>Hours Credit</th>
</tr>
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<tbody>
<tr>
<td>Vet. Animal Science 8510</td>
<td>5</td>
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<tr>
<td>Vet. Animal Science 8540</td>
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<tr>
<td>Vet. Medicine 8319</td>
<td>2</td>
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<tr>
<td>Vet. Microbiology 8101</td>
<td>5</td>
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<tr>
<td>Vet. Animal Science 8240</td>
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Winter Quarter
| Vet. Animal Science 8520  | 4            |
| Vet. Animal Science 8550  | 5            |
| Vet. Microbiology 8102    | 5            |
| Vet. Animal Science 8250  | 5            |
| Environmental Practice 8611 | 2          |

Spring Quarter
| Vet. Microbiology 8103  | 4            |
| Pathobiology 8730       | 4            |
| Pathobiology 8710       | 5            |
| Vet. Medicine 8019      | 1            |
| Vet. Medicine 8311      | 2            |
| Environmental Practice 8612  | 5          |

TOTAL: 62 hours

SECOND YEAR
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<tr>
<th>Summer Quarter</th>
<th>Hours Credit</th>
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<tr>
<td>Vet. Medicine 8312</td>
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<td>Vet. Medicine 8341</td>
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<td>2</td>
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<tr>
<td>Vet. Medicine 8363</td>
<td>2</td>
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Fall Quarter
| Vet. Medicine 8350     | 6            |
| Vet. Medicine 8340     | 4            |
| Vet. Medicine 8342     | 4            |
| Vet. Medicine 8344     | 1            |

Spring Quarter
| Vet. Medicine 8370  | 9            |
| Vet. Medicine 8371  | 3            |
| Vet. Medicine 8364  | 1            |
| Vet. Medicine 8365  | 3            |

TOTAL: 24 hours

Extramural Programs
The opportunity to participate in off-campus learning experiences may be available for a limited number of students during the elective portion of the third year of the professional curriculum. Selection of an extramural learning experience will require approval by the department concerned and the College of Veterinary Medicine Curriculum Committee five weeks prior to registration. The extramural program identified by the student must represent a learning experience not available within The University of Tennessee, Knoxville.

Professional Curriculum
The professional curriculum in veterinary medicine is an 11 academic quarter, year-round program, including summers. The first year (three quarters) consists mostly of pre-clinical subjects such as anatomy, physiology, microbiology, parasitology, and general pathology. The second year (four quarters) includes the study of diseases, their causes, diagnosis, treatment, and prevention. The final year (four quarters) is devoted to intensive training in the solving of animal disease problems, including extensive clinical experience in the teaching hospital. The curriculum also provides for education in the science and art of veterinary medicine and in paramedical subjects such as animal behavior,
Focus on veterinary medicine programs and courses offered by the University of Illinois College of Veterinary Medicine.

**Animal Science (114)**

**Veterinary Medicine**

**Professors:**
D. O. Richardson (Acting Head), Ph.D., D.V.M., Illinois; C. C. Chamberlain, Ph.D., Iowa State; S. L. Hansard, Ph.D., Florida; H. M. Jamison, Ph.D., Tennessee; J. B. McLaren, Ph.D., Auburn; J. M. Montgomery, Ph.D., Wisconsin; D. L. M. Johnston, Ph.D., Wisconsin; J. W. Oliver, D.V.M., Ph.D., Purdue; H. V. Shirley, Ph.D., Illinois; R. R. Shrode, Ph.D., Iowa State; E. W. Swanson, Ph.D., Missouri; R. L. Tugwell, Ph.D., Kansas State; C. E. Wylie (Emeritus), A.M., Missouri.

**Associate Professors:**
W. R. Backus, Ph.D., Tennessee; R. E. Carlee, D.V.M., Kansas State; H. E. Elor, D.V.M., Ph.D., Illinois; J. P. Hitchcock, Ph.D., Michigan State; J. W. Holloway, Ph.D., Oklahoma State; E. R. Lidvall, M. S., Tennessee; F. B. Maxineck, Ph.D., Kansas State; M. H. Sims, Ph.D., Auburn.

**Assistant Professors:**
J. A. Corr Rec, Ph.D., Tennessee; D. G. Doyle, Ph.D., Cornell; R. Heitmann, Ph.D., Maine; K. Robbins, Ph.D., Illinois; J. D. Smalling, Ph.D., Texas A & M.

**Instructors:**

In addition, academic expertise of staff members at CARR and Oak Ridge is used on appropriate occasions.

**Veterinary Physiology (4.5)**
Introduction to concepts and problems in physiology which form a base for clinical applications and for formal training in pharmacology, medicine, pathology, and surgery. Order of sequence: Cardiovascular, renal, respiratory, gastrointestinal, endocrine systems. 8240-50: Three lectures and 1 demonstration. 8250: 4 lectures and 1 demonstration.

**Veterinary Histology/Embryology (5.4)**
The cytology, histology and organization of animal body systems, emphasizing structural and functional interrelationships. Embryonic development from fertilization and the origin of congenital defects. Correlated with 8240-50 and 8250-50. 8510: three lectures and 2 labs. 8520: two lectures and 2 labs.

**Veterinary Gross Anatomy (5.5)**
Laboratory courses covering gross and applied anatomy of common domestic animals (dog, cat, horse, cow). Methods include dissection of embalmed specimens: study of gross structure, cross-sections, dissections, slides, models, and living animals. Sequence of organ system course correlated as much as possible with 8510-20.

**Special Problems in Animal Science (2-20)**
Specially designed study for students interested in certain topics in anatomy, histology and physiology. May be repeated.

**Advanced Seminar in Animal Science (1-4)**
Advanced seminars in various special aspects of applied anatomy, histology and physiology. Prereq: Envir. Prac. 8600, Pathobiology 8700, Rural Prac. 8900, and Urban Prac. 8800. May be repeated.

**Environmental Practice (346)**
Professor: J. B. Jones (Head), D.V.M., Illinois; J. W. Oliver, D.V.M. Ph.D., Purdue.

**Environmental Practice**

**Associate Professors:**

**Assistant Professors:**

**Residents:**
S. L. Huntress, D.V.M., Oklahoma State.

**8600 Basic Clinical Rotation In Environmental Practice**
Introductory clinical experience in laboratory animal and zoo animal medicine, epidemiology, and other related disciplines. May be repeated.

**8611-12 Pharmacology (2,5)**
Consideration of principles of pharmacokinetics as well as pharmacodynamic properties of veterinary drugs including modes of action, pharmacologic effects, chemical and physical properties, metabolism, toxicities, important idiosyncrasies, and clinical application. Correlated with 8420, 8250, and 8311. Two hours of lecture for 8611; five for 8612.

**8650 Environmental Clinical Practicess (2-20)**

**8670 Special Problems In Environmental Practice (2-10)**
Special problems in public health and epidemiology. May be repeated.

**8675 Advanced Seminar In Environmental Practice (1-4)**
Advanced seminars in various topics such as comparative medicine, public health, epidemiology. Prereq: Envr. Prac. 8600, Pathobiology 8700, Rural Prac. 8900, and Urban Prac. 8800. May be repeated.

**GRADUATE**

**5000 Thesis (1-15)**

**5010 Special Topics In Environmental Medicine (1-3)**

**5011-12 Pharmacology (1,2)**

**6000 Doctoral Research and Dissertation (3-15)**

**6010 Advanced Topics In Environmental Medicine (1-3)**

**Microbiology (685)**

**Veterinary Medicine**

**Professors:**
A. Brown (Head), Ph.D., D.C., Chicago; R. W. Beck, Ph.D., Wisconsin; J. H. Coggin, Jr., Ph.D., Chicago; D. F. Hutton (Emeritus), Ph.D., Ohio State; A. J. Girard, Ph.D., Pennsylvania; J. D. Mundy, Ph.D., Michigan State; B. T. House, B.V.S., University of Bristol (England); Ph.D., University of Guelph (Canada); J. M. Woodward, Ph.D., Kansas State; J. J. Wust, Ph.D., Indiana.

**Associate Professors:**
J. M. Becker, Ph.D., Cincinnati; D. A. Brian, D.V.M., Ph.D., Michigan State; T. C. Monte, Ph.D., Maryland; W. S. Riggsby, Ph.D., Yale.

**Assistant Professors:**
D. A. Bernis, Ph.D., Cornell; R. V. Miller, Ph.D., Illinois; G. S. Sayler, Ph.D., Idaho.

**8101 Veterinary Bacteriology and Mycology (5)**
Introduction to the pathogenesis of bacterial and fungal diseases. Organized as a taxonomic study relating microbial structure, metabolism and genetics to the patterns of disease and the mode of action of antimicrobials. Three hours lecture and 2 labs.

**8102 Veterinary Virology (4)**
Structure and replication of animal viruses, classification of viruses, mechanisms of viral pathogenesis. Techniques for quantitating viruses, viral antigens, and antiviral antibodies. Fundamental understanding of the best approaches to viral diagnosis, and immunophrophylaxis. Two lecture hours and 2 labs.

**8103 Veterinary Immunology (4)**
Basic concepts of immunobiology, mechanisms of immune reaction, diagnostic immunology, and the role of the immune response in preserving the integrity of the body as well as in causing disease. Two hours lecture and 2 labs.

**8175 Advanced Seminar In Microbiology (1-4)**
Advanced seminar in various topics in applied microbiology such as serologic diagnosis, clinical immunology, Prereq: Envr. Prac. 8600, Pathobiology 8700, Rural Prac. 8900, and Urban Prac. 8800. May be repeated.

**Pathobiology (742)**

**Professors:**
R. R. Mcllrx, D.V.M., Kansas State; D. Purdie; C. S. Patton, D.V.M. Ohio State.

**Assistant Professors:**

**Instructor:**

**Residents:**

**8700 Basic Pathobiology Rotation (2) Rotation through Laboratory, Department of Pathobiology. Practice and/or demonstrations in laboratory diagnostic techniques including postmortem pathology, clinical pathology, parasitology, and microbiology. May be repeated.

**8710 Veterinary Pathology (5)**
Principles of pathology including causes of disease, disturbances of cell growth, inflammation, and neoplasia. 3 hrs. of lecture and 2 labs.

**8730 Veterinary Parasitology (4)**
Basic principles of parasitology (protozoology, helminthology, and entomology) and their relation to disease in animals. 3 hrs. of lecture and 1 lab.

**8760 Veterinary Pathobiology (1-20)**
Provides student with particular interest in laboratory diagnosis further training in these techniques and additional experience in interpretation of observations. Prereq: Envr. Prac. 8600, Pathobiology 8700, Rural Prac. 8900, and Urban Prac. 8800. May be repeated.

**8770 Special Problems In Pathobiology (3-10)**
Provides student with opportunity to design and execute research project. May be repeated.

**8775 Advanced Seminar In Pathobiology (1-4)**
Advanced seminars in various diagnostic topics such as cytology, electron microscopy, histologic techniques. Prereq: Envr. Prac. 8600, Pathobiology 8700, Rural Prac. 8900, and Urban Prac. 8800. May be repeated.

**GRADUATE**

**5000 Thesis (-15)**

**5010 Comparative Pathology (5)**

**6000 Doctoral Research and Dissertation (3-15)**

**6010 Special Topics In Pathology (1-3)**

**6020 Special Problems In Pathobiology (1-5)**

**6052 Pathogenesis and Diagnosis of Virus Diseases In Domestic Animals (5)**

**Rural Practice (870)**

**Professors:**

**Associate Professors:**


8970 Special Problems in Large Animal Medicine, Surgery, and Theriogenology (2-10) Provides students opportunity to emphasize specific career objectives. Prereq: Environ. Pract. 8600, Pathobiology 8700, Rural Prac. 8900, and Urban Prac. 8800. May be repeated.

8975 Advanced Seminar in Rural Practice and Large Animal Clinic (1-4) Advanced seminars in various specialty areas such as equine medicine, food animal surgery, clinical toxicology. Prereq: Environ. Pract. 8600, Pathobiology 8700, Rural Prac. 8900, and Urban Prac. 8800. May be repeated.

8980 Urban Prac. 8800 (Basic Clinical Rotations). May be repeated.

8870 Special Problems in Urban Practice and Small Animal Clinic (2-10) Pursuit of special problems in anesthesiology, medicine, radiology and/or surgery in various specialty areas related to diseases of small companion animals. Prereq: Environ. Pract. 8600, Pathobiology 8700, Rural Prac. 8900, and Urban Prac. 8800. May be repeated.

8875 Advanced Seminar in Urban Practice and Small Animal Clinic (1-4) Advanced seminars in various specialty disciplines; such as neurology, cardiology, surgery, ophthalmology. Prereq: Environ. Pract. 8600, Pathobiology 8700, Rural Prac. 8900, and Urban Prac. 8800. May be repeated.

Interdepartmental Offerings

Veterinary Medicine (987)

8010 Client Relations and Communication Skills (1) Interpersonal skills as they apply to client relations and communication with colleagues, employees, and the general public. 1 hr. lecture and 1 lab.

8310 Introduction to Veterinary Medical Practice (2) Animal species, breed identification, basic care, feeding, restraint, and handling. Introduction to physical diagnosis, intravenous techniques, blood sampling, etc. 1 hr. lecture and 1 lab.

8311 Introduction to Veterinary Medical Practice (2) Physical diagnosis, history taking, and client relations; anesthetic principles, agents, and techniques. 1 hr. lecture and 1 lab.

85 2 Introduction to Veterinary Medical Practice (3) Basic surgical principles; preparation for surgery, wound healing and suturing; fundamentals of radiology. Correlated with 8320. 2 hrs. of lecture and 1 lab.

8320 Medical Science Interaction Laboratory (2) Multidisciplinary laboratory designed to provide learning experience and reinforcement of concepts in the disciplines of physiology and pharmacology. Application of anesthetic and surgical principles, human handling of animals, clinical chemistry technique, and introduction to instruments used to measure physiologic processes. Correlated with 8240. 8250, 8611 and 8612. 1 laboratory and 1 demonstration.

8340 Integumentary System (4) Diseases of integumentary system of animals, with emphasis on laboratory examination, interpretation of pathologic features, diagnosis, and treatment. Prereq: Pathobiology 8700.

8341 Hematopoietic System (3) Pathogenesis, diagnosis, and clinical management of diseases of hematopoietic and lymphoid organs and tissues.

8342 Alimentary Tract (8) Physiologic basis, pathology, diagnosis, and treatment of diseases of alimentary and digestive organs.


8344 Focal Problems (1) Considers specific diagnostic problems or paradigms important to veterinary medical practice: differential etiologic, diagnostic, and treatment of certain disease signs or symptoms; implications for veterinarian of medical jurisprudence and ethics, practice economics, and veterinary history. May be repeated. S/NC.

8350 Reproductive System (6) Diagnosis, therapy and prevention of those conditions causing a reduction of the reproductive efficiency of domestic animals. Abnormal conditions of the mammary gland with emphasis on prevention of mastitis.

8351 Urinary System (4) Integrated approach to understanding of urinary system of animals in health and disease.

8352 Cardiovascular System (3) Pathology, diagnosis, and management of cardiovascular diseases of animals. Emphasizes the anatomic, physiologic, and pharmacologic principles which provide the basis for medical and surgical treatment.

8353 Endocrine, Metabolic and Nutritional Diseases (4) Biochemical and pathophysiologic mechanisms of endocrine, metabolic and nutritional diseases of animals. Diagnosis, therapy and prevention.

8360 Musculoskeletal System I (5) Pathology, diagnosis, and treatment of musculoskeletal diseases of small animals. Emphasizing pathologic changes, interpretation of radiographs and surgical procedures.

8361 Musculoskeletal System II (5) Pathology, diagnosis, prognosis, and management of musculoskeletal diseases of large animals with emphasis on functional anatomy, radiographic interpretation, surgical procedures and medical therapy applicable to equines and ruminants.

8362 Veterinary Toxicology (3) Basic concepts of toxicology with emphasis on the molecular mechanisms and the pathologic and clinical features of animal diseases caused by common toxic agents.

8363 Public Health (2) Public health aspects of veterinary medicine and nature of related laws, ordinances, and regulations. Veterinarian's role in the protection of environment, ecology, and quantity and quality of food.

8364 Animal Dietetics (1) Applied nutrition of cattle, swine, horses, dogs and cats for the veterinarian. Diet and methods of feeding for both normal and special situations.

8365 Radiology (3) Advanced and special techniques in radiology; interpretation and use of radiology in diagnosis of clinical cases in medicine and surgery.

8366 Respiratory System (4) The detection and diagnosis of upper and lower respiratory diseases of domestic animals. Includes the pathophysiology and pathology of infectious and noninfectious diseases. Lectures and laboratories with live and simulated case studies.

8370 Neuroscience (9) Normal and abnormal neural structure and function in animals, with emphasis on clinical neurology and neuropathology.

8371 Visual and Auditory Systems (3) Methods of examination and treatment of diseases involving eyes and ears of animals, with emphasis on anatomic, physiologic, and pathologic features.

8372 Comparative Medicine (4) Diagnosis, prevention, and treatment of diseases of laboratory animals, avian species, and marine mammals seen most commonly by practicing veterinarians.

8375 Principles of Medicine (3) Physiologic and pathologic principles underlying mechanisms of disease. Selected examples of human and animal diseases with particular emphasis on recent scientific advances and their effects on veterinary medicine.

8460 Extramural Programs (2-20) Supervised off-campus educational program with an approved institution, limited enrollment. Prereq: Consent of department and the College of Veterinary Medicine Curriculum Committee.

Graduate

5000 Thesis (1-15)

6000 Doctoral Research and Dissertation (3-15)