Institute of Agriculture

Webster Pendergrass, Vice President
Eberl J. Chapman, Assistant Vice President

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 to offer instruction in agriculture and the mechanic arts for the first time. Since 1869, agricultural programs at the University have been expanded to include research for the development of new knowledge and extension for dissemination of such knowledge to rural people. Thus the Institute of Agriculture has come to include the work of four main divisions: College of Agriculture, College of Veterinary Medicine, Agricultural Experiment Station, and Agricultural Extension Service.

Agricultural Experiment Station

John A. Ewing, Dean
Thomas J. Whatley, Assistant Dean
Dorsey M. Gossett, 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 the promotion of practical agriculture through fundamental and applied research on all problems affecting farmers of the state. For example, there are research projects dealing with the development of new and improved varieties of farm and garden crops, the development of improved methods for the control of crop insects and crop diseases, and the evaluation of systems for the feeding, pasturing and management of livestock. Also, much attention is given to soils and fertilizers, mechanical devices of importance on the farm, human nutrition, and various rural economic and social problems. Priority is given to problems of special importance to the farmers of Tennessee.

The results of investigations are carried to the people in the form of bulletins, circulars, and reports, through the Agricultural Extension Service, and to the state educational system through the Colleges of Agriculture and Education. Rural life has been greatly enriched by the results of these investigations, as have the curricula of the school system.

Headquarters and the Main Station of the Agricultural Experiment Station are located at Knoxville. In addition, the Experiment Station operates research facilities at other locations in the state as follows:

UT-ERDA COMPARATIVE ANIMAL RESEARCH LABORATORY

This laboratory is located about 20 miles west of Knoxville near Oak Ridge. A program of radiobiological research in the field of Agriculture is carried out by the Agricultural Experiment Station under contract with the Energy Research and Development Administration. The program includes research with farm and laboratory animals, and in applied radiobiology and plant breeding.

Facilities at the laboratory include approximately 2,000 acres of land for maintaining livestock and growing plants to be used in experimental work, a research laboratory especially suited to large animal work, and a unique gammaradiation field.

In 1962, 2,200 acres of forest land near the laboratory area were acquired by the University. An arboretum containing some 250 acres has been established. Emphasis will be on collecting woody plants. In addition, this land will be used for research on recreational use of forested areas and on the adaptation of forest species to soils and other site factors.

THE UNIVERSITY OF TENNESSEE AT MARTIN

On January 1, 1965, the Agricultural Experiment Station was assigned responsibility for administration of the 600-acre farm adjacent to the Martin campus. The farm is used for both research and teaching. At the same time the School of Agriculture at Martin assumed research responsibilities and is working closely with the different departments in Knoxville in planning and executing the research program.

Experiments are under way with field crops, horticultural crops, dairy cattle, and beef cattle. The primary concern is with problems of special importance to the northwestern part of the state.

BRANCH STATIONS

Dairy Experiment Station near Lewisburg contains 615 acres and is operated in cooperation with USDA-ARS. Major emphasis is breeding and nutrition of Jersey cattle.

Highland Rim Experiment Station near Springfield contains 586 acres. Major emphasis is breeding and culture of dark-fired tobacco, other agronomic crops, horticultural crops, and livestock.

Middle Tennessee Experiment Station near Spring Hill contains 1,153 acres of representative high-phosphate Central Basin soils. Studies are under way with field crops, beef cattle, sheep, and dairy cattle of the Holstein breed.

Plateau Experiment Station near Crossville consists of three farms totaling 2,150 acres. Studies with beef cattle, sheep, field and horticultural 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 near Greenville consists of 536 acres. Extensive research on Burley tobacco is in cooperation with USDA-ARS. In addition, beef cattle and field crops are studied.

West Tennessee Experiment Station near Jackson contains 660 acres. Major emphasis is culture and breeding of cotton, other
agronomic crops, horticultural crops, and breeding and feeding of dairy cattle.

FIELD STATIONS

Ames Plantation near Grand Junction includes 18,550 acres (about 10,000 acres in forest). The land is in trust by the Ames Foundation for use by the Institute of Agriculture. Large scale experiments involve forestry, farm management, crop production, and breeding and management of beef cattle and swine.

Cumberland Forestry Field Station consists of two tracts in Morgan and Scott Counties with a total area of 9,450 acres.

Friendship Forestry Field Station is located in Hamilton County and consists of 660 acres owned by the TVA. Forestry research is conducted in cooperation with TVA.

Highland Rim Forestry Field Station near Tullahoma includes 860 acres. Research results apply generally on the Highland Rim.

Milan Field Station in West Tennessee consists of 497 acres. Research emphasis is mechanization of production of cotton, soybeans, and horticultural crops.

Agricultural Extension Service
William D. Bishop, Dean
M.L. Downen, Assistant Dean
Troy W. Hinton, Assistant Dean
Mildred F. Clarke, Assistant Dean

The Agricultural Extension Service serves the entire state of Tennessee. This educational service of the Institute of Agriculture is active in every country extending information on agriculture and 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 conferences — 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 to meet 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 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, and 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 young people to prepare for a future in agriculture and forestry are offered in the College of Agriculture. The college provides curricula leading to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Agricultural Engineering, Bachelor of Science in Animal Science, 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 Engineers' Council for Professional Development. 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 new College of Veterinary Medicine located in 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 Business, Agricultural Economics, 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 consult the curriculum outlined by the department in which he 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; and other courses are included to provide 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 each curriculum 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. Each curriculum leading to the degree of 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. The curriculum may include 8 hours of lower division military science credit in the 198 total. A minimum of 45 hours in agricultural courses is required. For the degree of Bachelor of Science in Forestry, and in Wildlife and Fisheries Science, the minimum requirement is 198 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 approved at the end of each 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.

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 is held each year 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
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 building, Morgan Hall; 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 research.
examinations should be submitted for consideration during the first quarter of study in the selected curriculum.

**BASIC CURRICULUM FOR AGRICULTURE**

All students working for a degree of Bachelor of Science in Agriculture will include in their course of study the following minimum requirements. The sequence and the selection of courses not specified will be guided by the adviser.

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<tr>
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<th>Course</th>
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<td>4</td>
<td></td>
<td>Agriculture 1120. Introduction to Agricultural Engineering</td>
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<td>4</td>
<td></td>
<td>Agriculture 1130. Animal Science for Agriculture</td>
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<td>Agriculture 1140. Plant Science for Agriculture</td>
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<td></td>
<td>Agriculture 1150. Food Technology and Science for Agriculture</td>
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<td>Agriculture Science. (courses listed in departmental curricula)</td>
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<td>17</td>
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<td>English and Communications. <em>(English)</em> 1510-20, Speech 2311, and elective 6 hours—literature or communications</td>
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<tr>
<td>12</td>
<td></td>
<td>Mathematics 1540-50-60. <em>(general mathematics)</em></td>
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<tr>
<td>12</td>
<td></td>
<td>Biological Sciences. <em>(biology)</em> botany, microbiology, or zoology</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Physical Sciences. <em>(Chemistry)</em> 1110-20-30 or 1510-20-30 and physics or geology</td>
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<tr>
<td>16</td>
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<td>Social Science and Humanities. <em>(Economics)</em> 2110-20 and electives, 12 hours— not more than 3 areas</td>
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<td>18</td>
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<td>Other Courses or Elective Hours Specified by Departments</td>
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<td>198</td>
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<td>TOTAL</td>
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</table>

*Equivalent honors courses

The five basic courses in agriculture are not departmental; but the course outlines and content were prepared by a group of experienced teachers representing the appropriate subject-matter areas. They are presented by a team of teachers who work together in developing the material in each course. The five courses are required of all agricultural students who seek the degree of Bachelor of Science in Agriculture; and the five teaching teams coordinate their work carefully to assure a unified program. A major purpose of the bachelor’s program is to present 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 concepts are presented to prepare suitable foundations for further study. These courses serve as a strong motivation for study in the physical, biological, and social sciences, and are prerequisite to advanced courses in technical agriculture.

An Honors Seminar 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 shares in this seminar as participants and resource people. The students gain experience and are encouraged to assume responsibilities not available in formally organized courses. Association with students and faculty from all phases of agriculture in the study of a common problem provides an unusual challenge.

**COURSE LOAD**

Students desiring to take more than 19 hours per quarter must have the approval of the Dean of the College.

**Agricultural Biology**

Adviser: Professor Southards

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 microorganisms, and plant parasitic nematodes are available to agricultural students. The department is currently comprised 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 the identification of the biochemical and ecological 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 insect and plant disease problems that constantly threaten Tennessee's dynamic agriculture.

**Agricultural Economics and Rural Sociology**

**AGRICULTURAL BUSINESS CURRICULUM**

Advisers: Professor Martin, Associate Professors Brooker and Snell, and Assistant Professors Mundy and Trevena

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 phase of agricultural business. Course offerings in the College of Business Administration have been used freely in this curriculum.

Preparation for work in such fields as crop cultivation, livestock and poultry marketing, fertilizer and feed businesses, 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.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Credit</th>
<th>Course</th>
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<td>English 1510-20</td>
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<td>Biological Science Electives</td>
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<td>12</td>
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<td>Philosophy 1540-50-60</td>
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<td>6</td>
<td></td>
<td>Electives</td>
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</table>
Agricultural Education
Advisers: Professor Wiegert and Associate Professors Craig and Todd

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 education 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.

Freshman

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<tr>
<td>Agriculture 1110-20-30-40-50-60</td>
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<td>English 1510-20</td>
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Sophomore

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<td>Chemistry 1110-20-30 or 1510-20-30</td>
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Junior

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<td>Agriculture Economics Electives</td>
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<td>Speech 2311</td>
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<td>Statistics 2100, 3220 and Statistics Elective</td>
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<td>Physics or Geology Electives</td>
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Senior

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<tr>
<td>Electives</td>
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</table>

TOTAL: 198 hours

*One hour must be in PE.

**Requires admission to teacher education.

Agricultural Engineering

AGRICULTURAL ENGINEERING CURRICULUM

Advisers: Professors Luttrell and Sewell

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 minimum requirements for admission include two units in algebra, one unit in geometry (preferably including some solid geometry), and one-half unit in trigonometry. Provisions for removal of deficiencies are made for students not meeting these requirements by registration in special classes during their freshman year.

The curriculum is designed to give training in the basic fundamentals of engineering and a background in agriculture. The graduate is trained to make application of engineering principles in the field of agriculture.

Graduates can go into design of farm machinery, soil and water conservation engineering, structures, buildings, animal waste disposal systems, or materials handling and processing systems. Opportunities are also available in the field of sales engineering, dealing with equipment, prefabricated structures, irrigation systems, or electrical-powered systems found in agriculture.

Industry, colleges or universities, government agencies such as the Soil Conservation Service, research organizations, foreign service, all offer employment opportunities to the graduate agricultural engineer. The curriculum provides for elective courses which can be taken in the student's area of interest and prepare him for the field he desires. The curriculum is designed to prepare students desiring to undertake a graduate program in agricultural engineering.

Students majoring in agricultural engineering are eligible to participate in the Engineering Cooperative Scholarship program, Engineers' Day program, engineering student publications, and other student activities in the College of Engineering. They are also eligible for selection into membership in Tau Beta Pi, Agricultural Engineering majors interested in the Cooperative Engineering Scholarship program should consult with the Head of the Department of Agricultural Engineering.

Freshman

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<td>Basic Engineering 1310-20-30</td>
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<td>Chemistry 1110-20-30</td>
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<td>English 1510-20-30</td>
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<td>Math 1840-50-60</td>
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Sophomore

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<tr>
<td>Agriculture 1110-20-30-40-50-60</td>
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<td>Speech 2311</td>
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Senior

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<td>Electives</td>
<td>23 or 24</td>
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</tbody>
</table>

TOTAL: 198 hours

*One hour must be in PE.

**Requires admission to teacher education.
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 desired emphasis in Agricultural Extension Education.

Animal Science
Advisers: Professors Johnson, Bloten, Chamberlain, Merriman, Murphy, Richardson, Shirley, Shrode, Swanson; Associate Professors Barth, Lidvall, McLaren, Montgomery; and Assistant Professors Conrick, Hitchcock, Holloway, and Smalley.

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 management, business, or science or elect the pre-veterinary courses preparatory for specialization. Elective selection permits special training for work with feed companies, meat animal, milk, or poultry production, managerial or marketing groups, other educational agencies, supply and equipment cooperatives, agricultural extension service, agricultural communication, public relations, and various organizations associated with agriculture. Students have the opportunity, through course selection, to procure the equivalent of double majors in Animal Science with Vocational Education, Plant and Soil Science, Agricultural Economics, or other available departments.

Freshman

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<th>Course</th>
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Sophomore

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<tr>
<td>Agriculture 1210</td>
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<td>Animal Science 2130</td>
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<td>Plant and Soil Science 3010</td>
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Agricultural Extension Education
Advisers: Professor Dotson and 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.

Junior

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<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
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<tbody>
<tr>
<td>Animal Science (Core required: Animal Science 3210, 3220, 3320, 3330, 3410, 3420, 3510)</td>
<td>23</td>
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<tr>
<td>Directed Electives - Evaluation</td>
<td>3</td>
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<tr>
<td>Communications Elective</td>
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<td>Electives</td>
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</table>

Non-Animal Science Agricultural Electives

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Animal Science 3210</td>
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<tr>
<td>Economics 2110, 2130</td>
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<tr>
<td>English or Communications Elective</td>
<td>3</td>
</tr>
<tr>
<td>Journalism 2210</td>
<td>3</td>
</tr>
<tr>
<td>Physics 2120-20</td>
<td>8</td>
</tr>
<tr>
<td>Plant and Soil Science 2130</td>
<td>4</td>
</tr>
</tbody>
</table>

Agricultural Mechanization Curriculum
Advisers: Professors Luttrell and Shelton

Agriculture's rapid mechanization is continually increasing the demand for graduates trained in the principles dealing with application of machines, systems, and structures designed by engineers for improvement of production, handling, processing, and storing of food and fiber. The graduate agricultural mechanization specialist may be involved in making material handling layouts for farmsteads, testing machinery for a manufacturer, managing a feed processing plant, or working with farmers in better utilizing electrical equipment and systems while working for an electrical power distributor. Positions are also filled as a farm manager, research technician, farm service adviser, also, positions are available in the areas of machinery, farm structures and irrigation equipment sales, educational and extension work with an institution, and educational and training programs in an agriculture-connected industry.

A student is able to minor in another field by carefully selecting his elective courses. This enables him to become better trained for a specific area of work in the technology or business fields.

Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td>Agriculture 1110-20-30-40</td>
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<tr>
<td>Agricultural Mechanization 2110</td>
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</tr>
<tr>
<td>Biology 1230</td>
<td>4</td>
</tr>
<tr>
<td>English 1510-20</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics 1540-50-60</td>
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Sophomore

<table>
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<tr>
<th>Course</th>
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<tr>
<td>Agriculture 1150</td>
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<tr>
<td>Chemistry 1110-20-30 or 1510-30</td>
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<td>Economics 2110, 2130</td>
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<tr>
<td>Journalism 2210</td>
<td>3</td>
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<tr>
<td>Physics 2120-20</td>
<td>8</td>
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<tr>
<td>Plant and Soil Science 2130</td>
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B. Production and Processing Option Courses

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
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<tr>
<td>Agricultural Mechanization 4210</td>
<td>3</td>
</tr>
<tr>
<td>Animal Science 3010</td>
<td>3</td>
</tr>
<tr>
<td>Food Technology and Science 3020</td>
<td>4</td>
</tr>
<tr>
<td>Foresty 2610</td>
<td>3</td>
</tr>
<tr>
<td>Forestry 3200</td>
<td>4</td>
</tr>
<tr>
<td>Plant and Soil Science 3050</td>
<td>4</td>
</tr>
<tr>
<td>Ornamental Horticulture 3010</td>
<td>3</td>
</tr>
<tr>
<td>Ornamental Horticulture 3020</td>
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Agricultural Mechanization Elective Group

<table>
<thead>
<tr>
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<tbody>
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<tr>
<td>Agricultural Biology 3210</td>
<td>4</td>
</tr>
<tr>
<td>Agricultural Mechanization 3110</td>
<td>3</td>
</tr>
<tr>
<td>Agricultural Mechanization 3210-20</td>
<td>6</td>
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<tr>
<td>Agricultural Mechanization 3510</td>
<td>4</td>
</tr>
<tr>
<td>Agricultural Mechanization 3100</td>
<td>3</td>
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<tr>
<td>Animal Science 2810</td>
<td>3</td>
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<tr>
<td>Microbiology 2010</td>
<td>4</td>
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<td>Office Administration 2750</td>
<td>3</td>
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<tr>
<td>Plant and Soil Science 3220</td>
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Humane-So-Social Science Elective

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>Agricultural Biology 3210</td>
<td>4</td>
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<tr>
<td>Agricultural Mechanization 3110</td>
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<tr>
<td>Agricultural Mechanization 3210-20</td>
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<tr>
<td>Agricultural Mechanization 3510</td>
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<tr>
<td>Agricultural Mechanization 3100</td>
<td>3</td>
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<tr>
<td>Animal Science 2810</td>
<td>3</td>
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<tr>
<td>Microbiology 2010</td>
<td>4</td>
</tr>
<tr>
<td>Office Administration 2750</td>
<td>3</td>
</tr>
<tr>
<td>Plant and Soil Science 3220</td>
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</table>

Humane-So-Social Science

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Accounting 2110</td>
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<tr>
<td>Agricultural Biology 3210</td>
<td>4</td>
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<tr>
<td>Agricultural Mechanization 3110</td>
<td>3</td>
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<tr>
<td>Agricultural Mechanization 3210-20</td>
<td>6</td>
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<tr>
<td>Agricultural Mechanization 3510</td>
<td>4</td>
</tr>
<tr>
<td>Agricultural Mechanization 3100</td>
<td>3</td>
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<tr>
<td>Animal Science 2810</td>
<td>3</td>
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<td>Plant and Soil Science 3220</td>
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Humane-So-Social Science Elective

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Agricultural Economics 4610</td>
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<tr>
<td>Agricultural Economics 4710</td>
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<tr>
<td>Agricultural Extension 3110</td>
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<tr>
<td>Agricultural Mechanization 4120-30</td>
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<td>Agricultural Mechanization 4160</td>
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<td>Agricultural Mechanization 4210-20</td>
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<tr>
<td>Food Technology and Science 3020</td>
<td>3 or 4</td>
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<tr>
<td>3840 or 4410</td>
<td>3 or 4</td>
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<tr>
<td>Humane-So-Social Science</td>
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<tr>
<td>Elective</td>
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<td>Elective</td>
<td>9</td>
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<td>Elective</td>
<td>11 or 12</td>
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TOTAL: 198 hours

6'Equivalent honors courses
7Students with less than 28 ACT math score must take Math 101 prior to 1840-50.
8Agricultural Engineering elective group: any two of Agricultural Engineering 4610, 4620, 4630, 4640.
9Humanities-Social Science electives from such fields as history, economics, government, literature, sociology, psychology, or fine arts (not more than three areas).
10The selection of technical electives must have approval of student's adviser and the department head prior to registration in the course.
quarter of the year in which they are applying. However, exceptions may be made in individual cases if a specific course(s) can be completed during summer school. It is strongly recommended that each interested student plan to pursue at least a three-year pre-veterinary program. Inquiries concerning possible course substitutions and the combining of the pre-veterinary program with a degree program should be directed to the department's pre-veterinary advisers. It is possible for students who are accepted into the College of Veterinary Medicine at the end of their third year to receive a B.S. in Agriculture with a major in Animal Science upon successful completion of the first year in the College of Veterinary Medicine. See the College of Veterinary Medicine for additional information.

A suggested schedule for the Pre-Veterinary Medicine - Animal Science student is given below which will allow for the completion of the above pre-veterinary requirements by the end of the third year and 2) allow the student to make normal progress toward completing the requirements for a degree in Agriculture with a major in Animal Science. It is strongly recommended that the student carry a normal load of at least 16 to 18 hours per quarter.

### First year
- English 1510-20: 8 credits
- Mathematics 1540, 1550, 1560: 12 credits
- Biology 1210-20-30: 12 credits
- Chemistry 1110-20-30: 12 credits
- Agriculture 1130: 4 credits
- Humanities electives: 4 credits
- **Quarter Hour Credits:** 52

### Second year
- Chemistry 3211-21-31: 9 credits
- Chemistry 3219-29-39: 3 credits
- Physics 2210-20-30: 12 credits
- Agriculture 1110: 12 credits
- Economics 2110: 3 credits
- Speech 2311: 4 credits
- Animal Science 3130 and 3330: 12 credits
- Humanities electives: 4 credits
- **Quarter Hour Credits:** 51

### Third year
- Biochemistry 4110-20: 6 credits
- Microbiology 2610: 5 credits
- Economics 2120: 3 credits
- Social Science electives: 2 credits
- Humanities electives: 4 credits
- Animal Science electives: 10 credits
- Electives: 20 credits
- **Quarter Hour Credits:** 52

**TOTAL: 155**

*Students with a strong math background may omit Math 1540 and start with 1550 or elect to take the 1840-50-60 series.

*Recommended elective for students with limited or no practical animal experience and required for those attempting to obtain the B.S. in Agriculture with a major in Animal Science in the regular program and for those accepted to UT College of Veterinary Medicine who are required by law to obtain the B.S. in Agriculture with a major in Animal Science after completion of the first year in the College of Veterinary Medicine.

*It is recommended that the student include AS 3420, one 3000 level evaluation course and one management course.

### ANIMAL SCIENCE CURRICULUM WITH A PRE-VET OPTION

**First year**
- English 1510-20: 8 credits
- Mathematics 1540, 1550, 1560: 12 credits
- Biology 1210-20-30: 12 credits
- Chemistry 1110-20-30: 12 credits
- Agriculture 1130: 4 credits
- Humanities electives: 4 credits
- **Quarter Hour Credits:** 52

**Second year**
- Chemistry 3211-21-31: 9 credits
- Chemistry 3219-29-39: 3 credits
- Physics 2210-20-30: 12 credits
- Agriculture 1110: 12 credits
- Economics 2110: 3 credits
- Speech 2311: 4 credits
- Animal Science 3130 and 3330: 12 credits
- Humanities electives: 4 credits
- **Quarter Hour Credits:** 51

**Third year**
- Biochemistry 4110-20: 6 credits
- Microbiology 2610: 5 credits
- Economics 2120: 3 credits
- Social Science electives: 2 credits
- Humanities electives: 4 credits
- Animal Science electives: 10 credits
- Electives: 20 credits
- **Quarter Hour Credits:** 52

**TOTAL: 155**

*For those accepted at the end of the third year of pre-veterinary medicine and desiring to receive a B.S. in Agriculture with a major in Animal Science upon successful completion of the first year in the University of Tennessee College of Veterinary Medicine, the following are required: Agriculture 1150 or equivalent Food Technology and Science course, Plant and Soil Science 2130, and Agriculture outside of Animal Science 6 hours (suggested Agricultural Mechanization 4160, Food Technology and Science 3640, Agriculture 3510, Plant Biology and Soil Science 3410).

*Students wanting to complete pre-vet requirements, but wishing to major in a department other than Animal Science, should consult with the appropriate departmental advisor for a proper selection of electives.

### Food Technology and Science

**Advisors:** Professors Miles and Overcast, Associate Professors Collins and Melton.

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 basic principles rather than on specific commodity procedures. Therefore, young 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, quality analyst, quality evaluation and control supervisor, plant manager and manager. Packaging specialist, ingredients specialist, etc. The Model Curriculum of the Institute of Food...
Technologists 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**
- Agriculture 1110-30-40-50 ........................................... 16
- English 1510-20 ...................................................... 8
- Mathematics 1540-50-60 .......................................... 12
- Physics 1210-20-30 .................................................. 12
- Social Science Elective ............................................. 3

**Sophomore**
- Agriculture 1120 .................................................... 4
- Chemistry 1110-20-30 or 1510-20-30 .......................... 9
- Economics 2110-20-30 ............................................. 9
- Food Technology and Science 2110-20 ......................... 7
- Microbiology 2160 ................................................... 4
- Speech 2311 .......................................................... 4
- Communications or English Elective ............................. 3
- Social Science Elective ............................................. 3

**Junior**
- Agricultural Mechanization 3160 .................................. 4
- Chemistry 2330 or Nutrition 3310 ............................... 12
- Nutrition 3220-30-39 .............................................. 12
- Food Technology and Science 3210-20 .......................... 7
- Food Technology and Science 4210 ............................. 3
- Microbiology 3810 .................................................. 4
- Plant and Soil Science 3610 ....................................... 3
- Communications or English Elective ............................. 3
- Social Science Elective ............................................. 3
- Electives .................................................................. 12

**Senior**
- Food Technology and Science 4010 ............................... 3
- Food Technology and Science 4110-20, 4310, 4810, 4920 16
- Food Science 4010 ................................................... 3
- Nutrition 3410 ........................................................ 5
- Electives .................................................................. 22

**TOTAL: 198 hours**

*Mathematics 1840-50-60 are desirable alternates for students with suitable entrance scores.
*Those students preparing for employment in commercial food industry should select business electives from such areas as agricultural economics, accounting, business law, industrial management and marketing. Student should consult with adviser before taking any elective.
*Or equivalent honors courses.

### Forestry

**Adviser:** Professor Barron

The profession of forestry is the science, the art, and the practice of managing and using for human benefit the natural resources which occur on and in association with forest lands. Benefits are derived from the multiple resources of the forest: wood, water, wildlife, recreation, forage, and environmental amenities. Foresters are managers of these resources. Thus, our principal instructional objective is to provide the broad education needed to deal effectively with the complex of forest resources.

In addition to the core of required courses there are about forty-three elective credit hours for broad studies or specialized training in one or more areas of forestry. These areas and examples of related fields of study include:

- **Wildlife Management**—ecology, zoology, botany.
- **Forest Engineering**—mathematics, physics, chemistry, engineering.
- **Industrial Forestry**—economics, business law, marketing, industrial management.
- **Forest Biology**—tree physiology, ecology, genetics, morphology.

*Transfer students should check with an adviser to assure that their schedule will include courses prerequisite to the Junior Field Session.
*Enough electives must be taken to total 198 hours for degree.

### FORESTRY RECREATION OPTION

The Forest Recreation Option provides students with opportunities to obtain an education in preparation for professional positions in the recreation field. Emphasis is placed on interpretation, and management of private and public forest lands for recreation purposes. Students are also exposed to the basic philosophy and principles associated with leisure time and its use, and the relationship of forest resources to the constructive utilization of leisure time.

**Freshman**
- Botany 1110-20 or Biology 1210-20 .......................... 8
- English 1510-20 ..................................................... 8
- Forestry 1620 .......................................................... 3
- Mathematics 1540-50-60 ......................................... 12
- Physics 1210-20 ...................................................... 8

**Sophomore**
- Computer Science 2140 ......................................... 8
- Economics 2110-30 .................................................. 6
- Forestry 3040-50 ..................................................... 6
- Sociology 1510-20 ................................................... 6
- Psychology 2500 ..................................................... 4
- Plant and Soil Science 2130 ...................................... 4
- Journalism 2210 ..................................................... 4
- Political Science 2020 ............................................. 4

**Junior**
- Forestry 3020, 3110, 3230, 3240, 3320 ........................ 16
- Plant and Soil Science 3610 ...................................... 3
- Anthropology 2530 ............................................... 3
- Recreation 3140 ..................................................... 3
- Journalism 3710 ..................................................... 3

**Senior**
- Forestry 3210, 4210, 4230, 4240, 4330, 4440 19
- Planning 4100 ........................................................ 3
- Ornamental Horticulture and Landscape Design 4210, 4180 8

**TOTAL: 198 hours**

*Or equivalent honors courses.
*Twenty hours of electives to be taken from the following courses: Accounting 2110-20, Accounting 3510

### WILDLIFE AND FISHERIES SCIENCE CURRICULUM

**Freshman**
- Biology 1210-20-30 .............................................. 12
- Mathematics 1540-50-60 ......................................... 12
- English 1510-20 .................................................... 8
- Speech 2311 .......................................................... 4
- Forestry 1620 ........................................................ 3
- Physics 1210 ........................................................ 4

**TOTAL: 198 hours**

*Or equivalent honors courses.
*Twenty hours of electives to be selected from a Department of Forestry approved list.
*Computer Science 210 is accepted in lieu of 2410 for those wishing to elect additional courses in this area.
Plants and Soil Science
Advisers: Professors Seitz, Skoold and Swingle and Associate Professors Reynolds and Smith

Plants 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 and high yields of high quality products; and weed control for efficient crop production.

Soil science includes studies in soil formation and classification for a better understanding of our soil resource as well as 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 chemical sciences and, in addition, be trained in communication skills. He may be broadly trained or he may choose to specialize in a more specific phase of the subject. Regardless of his 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 in 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, farmers' 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 salesmen. 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.

Each student selecting this major must complete the basic curriculum for agriculture and fulfill the major group requirements. The curriculum in plant science includes: Ornamental Horticulture, Turfgrass Management, and Landscape Design. The areas of study within this curriculum are: horticulture, nursery management, turfgrass management, and landscape design.

Ornamental Horticulture and Landscape Design
Adviser: Professor Williams

Man's needs go beyond food, clothing, and shelter. He requires a degree of control over his environment, especially his immediate surroundings. Ornamental plants and their use are recognized as part of the environment, hence a curriculum in Ornamental Horticulture and Landscape Design. The areas of study within this curriculum are: horticulture, nursery management, turfgrass management, and landscape design.

The area of horticulture includes the science of producing flowering plants in field and greenhouse and the art and science of using these plants for the benefit of man. Opportunities are available as greenhouse managers, floral designers, retail salesmen, 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 nurseryman include horticultural knowledge and a business sense. Students in this area are prepared for work in nurseries, garden centers, botanical gardens, and arboreums. They may find opportunities also in research, teaching, writing, sales, and landscape maintenance.

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 superintendent, park and recreational turf managers, owners of a lawn maintenance business, producer and seller of sod, research, teaching, and sales.

Landscaping means modifying man's outdoor environment to his 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 man's 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 nurserymen, landscape maintenance, garden center operation, allied sales, highway landscaping, park development, research, teaching, and writing.

Freshman

<table>
<thead>
<tr>
<th>Agriculture 1110-30-30-40-50</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Introductory Biological Sciences</td>
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<tr>
<td>English 1510-20</td>
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<tr>
<td>Mathematics 1540-50-60</td>
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</table>

Sophomore

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<thead>
<tr>
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<th>1510-20-30</th>
<th>12</th>
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<tr>
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<tr>
<td>Speech 2311</td>
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<tr>
<td>Physics 1210 or 2210</td>
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<tr>
<td>Plant and Soil Science 2130</td>
<td>4</td>
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<tr>
<td>Design 3010</td>
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<td></td>
</tr>
<tr>
<td>Design 3020</td>
<td>3</td>
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</tr>
</tbody>
</table>

Junior

| Social Science or Humanities Electives | 6 |
| Chemistry 2290 or 3211-19 | 4 |
| Agricultural Biology 3130, 3210 | 8 |
| Plant and Soil Science 3110 | 4 |
| Plant and Soil Science 3200 | 3 |
| Design 3030 | 3 |
| Design 3110 | 3 |
| Design 4120 | 4 |
| Design 4130 | 3 |
| Electives | 7 |

Senior

| Plant and Soil Science 3040 | 3 |
| Design 4150 or 4160 | 3 |
| Design 4210 | 4 |
| Design 4220 | 5 |
| Electives | 23 |

TOTAL: 120 hours

Or equivalent honors courses.

Students should consult with departmental adviser for suggested electives and suggested course of study.

Or equivalent physical course.

Mathematics 1480-50-60 may be substituted for students with high mathematics scores.

Or equivalent honors courses.

Or equivalent physical course.

Junior

| Social Science or Humanities Electives | 6 |
| Chemistry 2290 or 3211-19 | 4 |
| Agricultural Biology 3130, 3210 | 8 |
| Plant and Soil Science 3110 | 4 |
| Plant and Soil Science 3200 | 3 |
| Design 3030 | 3 |
| Design 3110 | 3 |
| Design 4120 | 4 |
| Design 4130 | 3 |
| Electives | 7 |

Senior

| Plant and Soil Science 3040 | 3 |
| Design 4150 or 4160 | 3 |
| Design 4210 | 4 |
| Design 4220 | 5 |
| Electives | 23 |

TOTAL: 120 hours
**Department of Agriculture**

**Agricultural Biology (037)**

Professor: L.F. Johnson, Ph.D. Louisiana State.

Associate Professors: J.W. Hilly, Ph.D. Ohio State; C.D. Piess, Ph.D. Clemson; H.E. Reeds, Ph.D. Ottawa; C.J. Southards (Head), Ph.D. North Carolina State; J.L. Wilson, Ph.D. Tennessee.


3130 Introductory Plant Pathology (4) Principles of plant patholgy 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) Etiology, recognition, economic impact, and control of forest tree diseases, including wood 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. 2 hrs and 2 labs.

3220 Apiculture (3) Biology of the honey bee, with emphasis of 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) Indentification, biology, ecology, and control of forest and shade tree pests. Prereq: 2210 or equivalent. 2 hrs and 1 lab.

**GRADUATE**

5000 Thesis

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

5210 Plant Parasitic Nematodes (4)

5220 Plant Disease Control (3)

5230 Field Crop and Vegetable Insects (3)

5240 Insect Pests of Man and Animal (3)

5310 Special Problems in Plant Pathology or Economic Entomology (1-6)

5410 Seminar (1)

**Agricultural Economics and Rural Sociology**

Professors: J.A. Martin (Head), Ph.D. Minnesota; M.B. Badenhop, Ph.D. Purdue; D.W. Brown, Ph.D. Iowa State; C.L. Cleland, Ph.D. Wisconsin; Irving Dubov, Ph.D. California (Berkeley); L.H. Keller, Ph.D. Kentucky; F.O. Leuthold, Ph.D. Wisconsin; W.P. Ranney (Emeritus), Ph.D. Minnesota; T.J. Whalley, Ph.D. Purdue.


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**Departmental Programs**

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**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 stiffs join in teaching these special courses annually and others are offered to meet immediate needs for special instruction. They 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.

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**Departments of Instruction**

Numbers in parentheses following the course titles indicate quarter hours credit offered.

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**Interdepartmental Offerings**

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**Agriculture (028)**

1110 Introduction to Social Sciences for Agriculture (4) Social sciences as they relate to agriculture—agriculture in the economy; tools of social science analysis applied to agricultural problems; agriculture, its development, relation to man, industry and government. 4 hrs and 1 lab.

1120 Introduction to Agricultural Engineering (4) Agricultural power and machinery fundamentals, agricultural structures, soils, and water conservation controls, and agricultural uses of electricity. 3 hrs and 1 lab.

1130 Animal Science for Agriculture (4) Animals in Agriculture: Body systems and development, principles of inheritance, fundamentals of feeding, and function of farm animals. Animal sanitation, animal products, and the relationship to public health. 3 hrs and 2 labs.

1140 Plant Science for Agriculture Plant structure, physiology, heredity and environment in relation to growth, adaptation, and management of crops. 3 hrs and 2 labs.

1150 Food Technology and Science in Agriculture (4) Utilization, processing, and distribution of food products. 3 hrs and 1 lab.

4018 Honors: Seminar (3) Selected topics. Offered alternate years. Open to juniors and seniors by invitation.

4110 Agricultural Industry Field Seminar (3) A travel study of the agricultural industry involving agricultural production, processing, marketing and services and their importance to the Knoxville area required. Prereq: Junior standing and permission of instructor.
Agricultural Economics (047)

3120 Agricultural Prices (3) Factors determining prices of farm products. Effects on price of varying degrees of commodity and monopolistic competition. 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: Agricultural Economics 1110 and Economics 2120.

3410 Farm Business Analysis (3) Techniques of analyzing a farm business. Factors affecting farm income and efficiency. Resource acquisition, cash flow, risk, tax, and tenure consideration. Practice in decision-making on simulated farm. Prereq: Agricultural Economics 1110 and Economics 2120. 2 hrs. and 1 lab.

3510 Commodity Futures Markets (3) Futures market as an instrument in marketing of primary industry products; process of passing to others the risk of adverse price change; price analysis from two view points: supply-demand and historism (fundamentalist and chartist). Prereq: Junior standing, 3 hr.

3710 Consumer Demand for Agricultural Products (3) Economic principles, practices and budgeting techniques to use in purchasing of goods and services. Evaluation of advertising and other related information. Prereq: Agricultural Economics 1110 and Economics 2120.

4120 Farm Management (3) Principles of farm organization and operation; allocating land, labor, and capital to meet changing technologies; tenure arrangements and use of credit; risks; measures of success. Use and analysis of records; exercises in planning farms. Field trips arranged. Prereq: Agricultural Economics 1110 and Economics 2120. 2 hrs. and 1 lab.

4110 Introduction to Agricultural Production Economics (3) Resource allocation, product selection, scale of operation of agricultural firms; aggregate effects of agricultural prices by individual, agricultural firms. Prereq: Agricultural Economics 1110 and Economics 2120, and senior standing.

4210 Problems in Agricultural Economics (3) Supervised laboratory course in methods of collecting and analyzing information and in writing a report. Prereq: Agricultural Economics 1110 and Economics 2120. Credit and hours arranged.

4240 World Agriculture and Trade (3) Economic bases of world agricultural production and trade: resource location, land tenure systems, international trade and commercial policy. Prereq: Agricultural Economics 1110 and Economics 2120, or consent of instructor.

4250 Agricultural and Rural Planning (3) Decision-making concepts applied to design and implementation of local action programs. Case examples from the United States and abroad. Prereq: Agricultural Economics 1110 and Economics 2120, or consent of instructor.

4310 Agricultural Finance (3) Nature and source of capital; credit problems of farmers; kinds and sources of farm credit; Agricultural Insurance and taxation. Prereq: Agricultural Economics 1110 and Economics 2120.

4320 Agricultural Policies (3) Meaning of agricultural policy in democratic society; relationship of farmers to groups in public policy; problems governing the public policy; types of agricultural policy and appraisal of results; current policy problems. Prereq: Agricultural Economics 1110 and Economics 2120.

4330 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: Agricultural Economics 1110 and Economics 2120.

4610 Management of Farm Supply and Marketing Firms (3) Operations of farm supply and merchandising agricultural products. Emphasis on accounting data and the economic theories for decision-making. Prereq: Agricultural Economics 1110 and Economics 2120.


4710 Agricultural Law (4) Survey of law and application to the farmer, his family, and agricultural industry. Property, contracts, torts, drainage and water rights, landlord-tenant relationships, taxation and insurance, forms of business organization, estate planning, regulatory laws, and other selected topics.

GRADUATE 5000 Thesis 5011 Special Problems In Lieu of Thesis (3) 5120 Agricultural Price Analysis (3) 5130 Advanced Agricultural Production Economics (3) 5210 Seminar: Agricultural Policies (3) 5220 Seminar: Methodology of Research (3) 5230 Seminar: Adjustments to Industrialization (3) 5310 Research (3) 5410 Agricultural Marketing Analysis (3) 5420 Advanced Land Economics (3) 5440 Economics of Agricultural Development (3) 5510 Quantitative Methods in Agricultural Economics (3) 5710 Quantitative Methods in Agricultural Economics (3) 6000 Doctoral Research and Dissertation 6110-30-30 Seminars in Agricultural Economics (3, 3, 3) 6210 Agricultural and Rural Transformation Problems (3) 6410 Agricultural Supply Analysis (3) 6420 Marketing and Resource Use (3) Rural Sociology (680) 3420 Rural Sociology (3) Nature of rural society; social systems concept; rural-urban differences; nature of social relations; population characteristics and movement; problems of rural people; tenancy, farm labor, health, services, educational facilities, churches, local government; impact of industrialization.

4450 Diffusion of Agricultural Technology (3) Analysis of diffusion process, whereby new technology spreads from scientists to final adopters. Topics discussed include adoption process, communication behavior, mass role, professional change agents, opinion leadership, and two-step flow hypothesis. Prereq: Rural Sociology 3420, or consent of instructor.

GRADUATE 5340 Special Problems (3) 5430 Rural Sociology Seminar (3) Agricultural Engineering

Professors:
H. Luttrell (Head), Ph.D. Iowa State; J.J. Sewell, Ph.D. North Carolina State, P.E.; J.J. McDow, Ph.D. Michigan State, P.E.

Institute of Agriculture 53

Associate Professors:

Assistant Professors:
D.T. Gelbatter, M.S. Indiana; F.D. Tompkins, Ph.D. Tennessee; L.R. Wilhem, Ph.D. Tennessee, P.E.

Agricultural Engineering (066)

1130 Introductory Agricultural Engineering (3) Basic engineering principles for field agricultural engineering. 2 hrs. and 1 lab.

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

3810 Soil and Water Conservation Engineering (4) Integration of hydrologic, agronomic, and engineering principles in solving agricultural water management problems involving flood 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) Analysis of loads and stresses; design of wood, steel and concrete members; structural and environmental requirements for livestock and crop production and storage; physiological requirements; heat loads; insulation; moisture relationships; ventilation, and waste management. 3 hrs. and 1 lab. Graduate credit for non-majors only.


3640 Power Units and Machinery (4) Components and operating 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-majors only.

4120-30 Seminar (1, 3, 3) Presentations, discussions, reports. 4120—Professional development topics. 4130—Industry trip. Prereq: Permission of department head.

4220 Special Problems in Agricultural Engineering (3) Selection, analysis, solution, and report of research problem. May be repeated for credit, not more than nine hours credit when engaged in Cooperative Engineering or other approved industry work. Prereq: 3100 and permission of department head.

4230 Selected Topics in Agricultural Engineering (3) Develop new topical areas as required by current trends and problems in agricultural engineering.

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

4620 Design of Structures for Production, Processing and Environmental Control (3) Functional planning and structural design of agricultural building-emphasis placed on complete design of structure or system; design to function, structural, and environmental aspects. Prereq: 3620. 1 hr. and 2 labs.

4630 Design of Processing and Material Handling Systems (3) Development of systems and components for integrated agricultural processing consisting of mass and material flow, equipment specifications, storage, handling and economic merit. Prereq: 3630. 1 hr. and 2 labs.

4640 Design of Agricultural Machinery (3) Functional requirements of agricultural machinery. Ele-
ments of machine design component; synthesis of mechanisms, mechanical and hydraulic drives. Team effort in completing machine design project. Prereq: 3640 or permission of instructor. 1 hr. and 2 labs.

GRADUATE 5000 Thesis
5240 Environmental Control in Agricultural Structures (3)
5340 Hydrology of Agricultural and Forest Lands (3)
5440 Instrumentation in Agricultural Systems (3)
5540 Engineering Properties of Agricultural Materials and Products (3)
5640 Research Problems in Agricultural Engineering (3)
5710-20 Similitude in Design and Research (3, 3)
6000 Doctoral Research and Dissertation
6110 Seminar (1)
6310 Engineering Systems Analysis in Agriculture (3)
6610 Selected Topics in Agricultural Engineering (3)

Agricultural Mechanization (080)
2110 Agricultural Drawing and Mapping (3) Fundamentals of graphics and mapping, with emphasis on applications in agriculture and forestry. 1 hr. and 2 labs.
2120 Agricultural Surveying (3) Measurement of horizontal distances and angles; differential and profile leveling; topographic surveying and mapping; area computation. Prereq: Math 1560 or permission of instructor. 1 hr. and 2 labs.
2210 Forest Surveying (2) Instruments, methods, and computations used in determining distances, angles, elevations, and area related to forest management problems. Credit cannot be given for both 2120 and 2210. Prereq: Math 1560. 1 hr. and 1 lab.
3100 Seminar (1) Presentations, discussions, reports on research techniques. Prereq: Permission of department head.
3110 Agricultural Mechanics (3) Organizing equipment, and managing school and farm shops; techniques, materials, and procedures in design and construction of shop projects; metal work and welding. 1 hr. and 2 labs.
3140 Forest Surveying and Mapping (3) Use of low-precision methods and instruments including pacing, Abney level, topographic trailer tape, hand compass, and staff compass. Field measurements, computations and layout involving random and true lines, traverses, topographic mapping and forest roads. Prereq: 2140. Ten periods of six hours per period.
3210 Soil and Water Conservation Facilities (3) Leveling, topographic surveying; planning, construction, 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 1550. 2 hrs and 1 lab.
3510 Agricultural Utilities and Processing Equipment (4) Electrical equipment; controls; water systems; heating and refrigerating systems; waste disposal systems. Prereq: Agr. 1120; Physics 1220. 3 hrs and 1 lab.
4120-30 Seminar (1, 1) Presentations, discussions, reports. 4120—Professional development topics. 4130—Industry trip. Prereq: Permission of department head.
4160 Agricultural Waste Utilization and Disposal (3) Techniques, equipment, and structures for utilizing, treating, and disposing of agricultural wastes by land spreading, incineration, 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; materials handling and disposal methods. 2 hrs and 1 lab.
4210 Agricultural Machinery and Tractors (4) Agricultural machinery and power units; adaptation to agricultural 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 nine hours credit when engaged in approved industry work. Prereq: 3100 and permission 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 access roads, culverts, and timber bridges. Prereq: 2130 or 2140. 3 hrs and 1 lab.
GRADUATE 5000 Thesis
5110 Research Problems in Agricultural Mechanization (3)
5210 Electro-mechanical Systems in Agriculture (3)
5310 Instrumentation in Agriculture (3)
5410 Agricultural Machinery System Analysis (3)
5610 Selected Topics in Agricultural Mechanization (3)

Agricultural Extension Education (075)
Professor: R.S. Dobson (Head), Ph.D. Pennsylvania State.
Associate Professor: C.E. Carter, Jr., Ph.D. Ohio State.
3110 Introduction to Agricultural Extension (3) History; philosophy; organization; teaching methods; and relationships with other educational agencies.
4110-20 Field Studies (3, 3) Supervised work experience with county extension agents in a designated county. For senior and graduate students. Prereq: 3110, and permission of instructor. Requires living off-campus for a specified time.
GRADUATE 5000 Thesis
5011-21 Special Problems in Lieu of Thesis (3, 3)
5100 Special Problems in Agricultural Extension (1-6)
5210 Long-Range Extension Program Planning (3)
5220 Seminar (3)
5230 Evaluation in Programs of Agricultural Extension (3)
5310 History, Philosophy and Objectives (3)
5320 Volunteer Leadership in Agricultural Extension Programs (3)
5330 Supervision of Agricultural Extension Programs and Personnel (3)

Animal Science (113)
Professors: R.R. Johnson (Head), Ph.D. Ohio State; M.C. Bell, Ph.D. Oklahoma State; J.K. Bitner, Ph.D. Ohio State; C.C. Charnley, Ph.D. Illinois; S.L. Hansard, Ph.D. Florida; H.M. Jamieson, Ph.D. Tennessee; R.R. Soderberg, Ph.D. Michigan State; R.L. Murphee, Ph.D. Wisconsin; D.O. Richardson, Ph.D. Ohio State; H.V. Shirley, Ph.D. Illinois; R.R. Shrive, Ph.D. Ohio State; E.W. Swanson, Ph.D. Missouri; C.E. Wylie (Emeritus) A.M., Missouri.
Associate Professors: W.L. Backus, Ph.D. Tennessee; K.M. Barth, Ph.D. Rutgers; G.L. Branton, D.V.M., M.S. Texas; A.M. E.R., Lichtenstein, M.S. Tennessee; J.B. McLaren, Ph.D. Auburn; M.J. Montgomery, Ph.D. Wisconsin.
Assistant Professors: J.A. Cornick, Ph.D. Tennessee; J.P. Hitchcock, Ph.D. Michigan State; B. Ph.D. Tennessee; F.B. Masincup, Ph.D. Kansas State; J.D. Smalling, Ph.D. Texas A & M.
In addition, academic expertise of staff members at AMU, Oak Ridge, and U.T. College of Veterinary Medicine are used on appropriate occasion.

2610 Fundamentals of Meat Animal Evaluation (3) Criteria for live animal and carcass evaluation; market classes and grades and their significance; subjective and objective techniques for determining muscle and fat relationships in cattle, hogs and sheep. 1 hr. and 2 labs.
2710 Introduction to Biometrical Aspects of Animal Science (3) Biometrical concepts for optimum comprehension of material presented in upper division animal science courses. Baseline knowledge is assumed, and introduction to concept of distributions. Expected values of variables as most probable values, binomial 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) Integration of management practices and skills into cattle, horse, sheep, poultry and swine enterprises. Practices and skills include dehorning; castrating; docking; foot care; shearing, age determination, identification; preparing for show and sale; vaccinating and immunizing; and controlling parasites. Facilities needed in livestock management including buildings, fences, corrals, equipment, space requirements and restraining devices. 2-3 hrs lab.
2820 Introduction to Light Horses (3) Scope and role of light horse industry: breeds—development, function and use; unsoundness; tack; introduction to horse management practices. May not be used by Animal Science majors to meet graduation requirements. 2 hrs and 1 lab.
3210 Anatomy and Physiology and Farm Animals (4) Skeletal and joints, skeletal muscles, blood and microcirculation, and nervous, cardiovascular, respiratory, digestive, renal and endocrine systems; demonstration of physiological phenomena. Prereq: Biology 1210 or Agriculture 1130. 3 hrs and 1 lab.
3220 Physiology of Reproduction (3) Comparative anatomy and physiology of reproductive systems of higher vertebrates; gametogenesis, fertilization, implantation, prenatal growth, parturition and initiation of lactation; endocrine regulation of reproductive phenomena. Prereq: 3210 or permission of instructor. 2 hrs and 1 lab. (Same as Zoology 3220)
3310 Introduction to Animal Nutrition and Feeding (3) Nutrient utilization, function and requirements of farm animals; animal feeds, nutrient content and factors affecting feeding value; balancing rations for beef and dairy cattle, sheep and swine. Not available to students with credit in 3320. Prereq: Agriculture 1130, Chemistry 1150 or 1153. 2 hrs and 1 lab.
3320 Animal Nutrition (3) Properties, functions, utilizations and deficiency symptoms of essential nutrients; nutritive value determinations and their use.
Prep: Agriculture 1130 and one quarter of organic chemistry 2 hrs and 1 lab.

3330 Feeds and Ration Formulation (3) Feedstuffs, additives, feeding standards, nutrient requirements and ration formulation for beef and dairy cattle, sheep, poultry, swine, and laboratory animals. Prep: 3320. 2 hrs and 1 lab.

3410 Heredity in Animals (3) Basic chromosomal mechanism of heredity with emphasis on Mendelian principles and exceptions such as linkage and cyto-Plasmic inheritance. Introductions to biochemical basis of heredity and to quantitative inheritance. Illustrations of principles related to species familiar to agriculture students. Prep: Agriculture 1130. 2 hrs and 1 lab.

3420 Principles of Animal Breeding (3) Genetic principles involved in breeding of economic species. Genetic basis of variation. Partitioning of variation according to various kinds of causative difference such as differences in genetic makeup and environment. Selection and consequences. Mating systems and handling of laboratory animals. Prep: Agriculture 1140 or equivalent. 2 hrs and 1 lab.

3430 Breeds of Farm Animals (3) Study of evolution and formation of breeds of cattle, horses, sheep, and swine. Breeding structure. History, development, characteristics and improvement programs. Breeding practices 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; herd health programs. Prep: 1135 or 2610 or permission of instructor. 3 hrs and 1 lab.

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


3620 Dairy Cattle Judging and Classification (3) Conductive cattle judging; oral reasoning; typing. Precaution classification programs. Economic value of classification ratings. 3 labs.

3630 Judging Poultry and Poultry Products (3) Grade poultry and poultry products according to USDA standards; factors affecting quality. 1 hr and 2 labs.

3640 Horse Selection and Judging (3) Selection, judging, evaluation of soundness and scoring of work for conformation and functional efficiency. Prep: Permission of instructor. 1 hr and 2 labs.

3810 Nutrition and Management of Laboratory Animals (3) Principles of feeding, breeding and handling of animals in scientific investigations, specific species' requirements, peculiarities and search for which best fitted; laws governing use and handling of laboratory animals. Prep: Agriculture 1130 and permission of instructor. 2 hrs and 1 lab.

4110 Special Problems in Animal Science (1-4) Special research and/or special reports based on supervised study in Animal Science. Prep: 2110 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 9 hrs credit. Prep: Senior standing and permission of instructor. 1 lab.

4210 Physiology of Lactation (3) Development, anatomy and function of mammary glands; en- docrine interactions for mammary development and milk secretion; factors affecting yield and composi- tion of milk. Prep: 3210.

4220 Avian Physiology (3) Anatomy and physiology of avian species with emphasis on poultry. Prep: 3910. 2 hrs and 1 lab.

4230 Applied Reproduction in Farm Animals (3) Application of methods and techniques in collecting, evaluating, processing and preserving semen; insemination of females; pregnancy determination; gestation and parturition. Male and female infertility. Prep: 3220. 1 hr and 2 labs.

4310 Feeding Systems for Ruminants and Horses (3) Applications of nutrition and feeding principles in comparison of feeding systems utilized during the life cycle of cattle, horses and sheep. Prep: 3330. 2 hrs and 1 lab.

4320 Feeding Systems for Poultry and Swine (3) Applications of nutrition and feeding principles in comparison of feeding systems utilized during the life cycle of poultry and swine. Laboratory feeding trials to demonstrate basic nutrition concepts. Prep: 3330. 2 hrs and 1 lab.

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

4510 Advanced Beef Cattle, Dairy Cattle, Horse, Poultry, Sheep, and Swine Judging (2) Specializa- tion in judging, evaluation, selection, and presenta- tion of oral reasons on classes of beef cattle, dairy cattle, horses, poultry, sheep and swine. May not be repeated for credit. Prep: Permission of instructor. 1 lab.

4810 Beef Cattle Production and Management (4) Integration of principles of nutrition, physiology and breeding into complete beef cattle management program. Topics will include structure of industry, enterprise establishment, systems of production, production practices, and herd improvement programs. Alternatives evaluated in terms of production response and economic returns. Prep: Senior standing and permission of instructor. Recommended course be taken after completion of sophomore and junior Animal Science core courses. 3 hrs and 1 lab.

4820 Dairy Cattle Production and Management (4) Integration of principles of nutrition, physiology and breeding into complete dairy cattle management program. Topics will include structure of industry, enterprise establishment, systems of production, production practices, and herd improvement programs. Alternatives evaluated in terms of production response and economic returns. Prep: Senior standing and permission of instructor. Recommended course be taken after completion of sophomore and junior Animal Science core courses. 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 and management program. Topics will include structure of industry, enterprise establishment, systems of production, production practices, and herd improvement program. Alternatives evaluated in terms of production responses and economic returns. Prep: Senior standing and permission of instructor. Recommended course be taken after completion of sophomore and junior Animal Science core courses. 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. Prep: Senior standing and permission of instructor. Recommended course be taken after completion of sophomore and junior Animal Science core courses. 3 hrs and 1 lab.

4850 Light Horse Production and Management (3) 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 facili- ties for both pleasure owners and commercial pro- ducers. Alternatives evaluated in terms of pleasure, recreational and economic returns. Prep: Senior standing and permission of instructor. Recommended course be taken after completion of sophomore and junior Animal Science core courses. 2 hrs and 1 lab.

4860 Lamb and Wool Production and Management (3) Integration of principles of selection, nutrition, breeding, physiology and marketing into complete lamb and wool production and management pro- gram. Topics will include structure of industry, enterprise establishment, systems of production re- sponses and economic returns. Prep: Senior standing and permission of instructor. Recommended courses be taken after completion of sophomore and junior Animal Science core courses. 2 hrs and 1 lab.

4910 Seminar (2) Review of literature and presen- tation of special topics and current research in animal science field. Prep: Senior standing. 1 hr and 1 lab.

GRADUATE

5000 Thesis

5011 Problems in Lieus of Thesis (1-6)

5110 Special Problems in Animal Science (1-6)

5210 Endocrine Relations in Animal Production (4)

5230 Advances in Mammalian Reproduction (3)

5240 Advanced Studies of the Secretion of Milk (3)

5311 Analytical Techniques in Animal Nutrition (3)

5321 Energy in Animal Nutrition (4)

5331 Proteins in Animal Nutrition (3)

5341 Vitamins and Minerals in Animal Nutrition (3)

5410 Genetics of Animal Populations (3)

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)

6211 Advanced Topics in Animal Physiology (1-6)

6220 Environmental Physiology of Farm Animals (3)

6230 Animal Growth and Development (3)

6311 Advanced Topics in Animal Nutrition (1-6)

6411 Advanced Topics in Animal Breeding (1-6)

6420 Animal Breeding Research Methods and Inter- pretation (3)

6811 Advanced Topics in Animal Products (1-6)

6910 Seminar (1)

Food Technology and Science (378)

Professors: J.T. Miles (Head), Ph.D. Wisconsin; T.B. Harrison (Emeritus), M.S.A. Tennessee; W.W. Overcast, Ph.D. Iowa State.

Associate Professors: J.L. Collins, Ph.D. Maryland; B.J. Demott, Ph.D. South Carolina State; H.C. Haynes, Ph.D. Illinois; C.C. Melton, Ph.D. Kansas State.

Assistant Professors: E.A. Childs, Ph.D. Georgia; S.L. Melton, Ph.D. Tennessee; M.J. Riemann, Ph.D. Kansas State.

2110 Food Regulations and Standards (3) Federal and State laws regulating food industry. Quality grades and standards and methods of evaluating processed foods. 2 hrs and 1 lab.

2120 Food Manufacturing (4) Preparation of raw material, cleaning, grading, slicing, crushing, ex-tracting, filtering, pumping, mixing and heat pro-cessing. Prep: Math 1550. 3 hrs and 1 lab.

3020 Dairy Products I (4) Processing, processing and distribution of fluid milk. Manufacture of frozen and condensed dairy products. 3 hrs and 1 lab.
3210 Food Composition (3) Determination and study of food materials and their effects on health and processed foods with attention to changes and interactions occurring during processing and storage. Prereq: Chemistry 1120 or 1503 or 1520. 2 hrs and 1 lab.

3220 Food Preservation (4) Survey of food industry and chemicals used in food preservation and aspects of deterioration of food. Prereq: Microbiology 2610. 3 hrs and 1 lab.

3570 Evaluation and Grading Dairy Products (3) Market standards and grading 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 evaluation of meat and processed meat products. 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 cookery. 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 for a maximum of 9 hours credit. Prereq: Permission 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 hours credit. Prereq: Junior standing and permission of instructor.

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

4050 Advanced Food Composition (3) Intensive studies on the composition and changes affected by processing and storage. Prereq: 3210 and Nutrition 3320 or equivalent. 2 hrs and 1 lab.

4110 Food Plant Sanitation (3) Environment for manufacturing and processing foods. Prereq: Junior standing. 2 hrs and 1 lab.

4120 Food Quality Assurance (3) Systems for quality assurance in food industries. Various methods including statistics used by food industries to assure desired quality of food products. Prereq: Junior standing and 3 hrs statistics. 2 hrs and 1 lab.

4120 Food Additives (3) Substances used in food manufacturing with emphasis on properties and functions. Prereq: Nutrition 3320 or equivalent.

4130 Food Packaging (3) Characteristics and applications of materials and containers to packaging requirements of food. Prereq: 3220. 2 hrs and 1 lab.

4140 Food Crop Products (3) Food products from crops with emphasis on types, manufacturing systems, quality attributes and utility.

4810 Microbiology in Food Manufacturing (3) Relationship of growth of common food microorganisms in fermentative and enzymatic changes occurring during processing and manufacturing of foods. Prereq: Microbiology 2610 or equivalent. 1 hr and 2 labs.

4820 Fermented Foods (3) Role of microorganisms in preparing foods with emphasis on development of certain desirable characteristics, flavor, aroma, texture, and keeping quality. Prereq: Microbiology 3810. 2 hrs and 1 lab.

4840 Meat Products Manufacturing (3) Prepared meat products, emphasis on sausage making and information relating to cost controls, inspection and heat science. Prereq: 3840 or consent of instructor. 1 hr and 2 labs.

4920 Physical Phenomena of Foods (4) Physical states of food materials, foams, emulsions, colloidal soils, hydrates, crysals, gels. Effects of manufacturing practices on these properties. Prereq: Consent of instructor. 3 hrs and 1 lab.

GRADUATE

5000 Thesis
5100 Seminar (1)
5120 Food Color (3)
5130 Food Enzymology (3)
5140 Food Flavors (3)
5150 Fats and Oils (3)
5200 Research (1-5)
5310 Food Products Development (3)
5320 Food Thermobiology (3)
5420 Advanced Food Quality Assurance (3)
5510 Meat Technology (3)
5530 Microorganisms Common in Food Products (3)
5540 Microbial Cultures in Foods (3)

Forestry

Forestry (396)

1620 Introduction to Forestry (3) History of forestry; establishment, care, protection and use of forest stands; forest products industries; organization and agencies for establishment of forest policies; forest resources.

3020 Forest Environments and Ecology (3) Forest environments and ecology of forests and associated lands; emphasis on the application of ecological principles to contemporary problems. Available for graduate credit for non-forestry majors only. Prereq: 8 hours of biology, botany, or zoology. 3 hrs.

3040 Dendrology and Silvics of Woody Angiosperms (3) Classification, nomenclature, identification, and silvicultural characteristics of the major woody angiosperms native to North America; native ranges, distribution patterns, and habitat requirements; regeneration, reproduction, and life history, place in succession; ecological significance of forest management importance. Weekly field trips during scheduled lab period plus one weekend field trip. Available for graduate credit for non-forestry majors only. Prereq: 8 hours basic biology or botany. 2 hrs and 1 lab.

3050 Dendrology and Silvics of Gymnosperms (3) Classification, nomenclature, identification, and silvicultural characteristics of the major North American conifers. Distribution patterns, habitat, and community relationships including classification, life history, regeneration requirements, place in succession, and importance. Available for graduate credit for non-forestry majors only. Prereq: 8 hours basic biology or botany. 2 hrs and 1 lab.

3110 Forest Measurements and Biometry (4) Measurement of individuals in animal and plant populations; linear regression; sampling of forest populations; growth and potential production. Prereq: Plant and Soil Science 3610 and Computer Science 2410 or equivalent. 3 hr and 1 lab.

3120 Wood Technology (4) Wood properties; identification of commercial woods by macro and microscopic characteristics. Prereq: 3040, 3050. 2 hrs and 2 labs.

3130 Forest Protection (3) Destructive agencies; fire, insects, diseases; chemical, mechanical, and biological control; protection and suppression. Prereq: Agricultural Biology 3210, 3130.

3210 Forest Economics (3) Supply, demand, price relationships; input-output studies; taxation, insurance. Economics aspects of multiple use. Prereq: Economics 2120.

3220 Forest Products and Utilization (3) Handling, processing, marketing factors in stand conversion, intermediate and harvest cuts. Prereq: 3120, Chemistry 1530, Economics 2120.

3230 Wildlife Management (3) Lives and ecological relationships of wild animals; biological, social, and economic aspects of their management. 2 hrs and 1 lab. (Same as Wildlife and Fisheries Science 3230).

3240 Introduction to Forest Recreation (3) Concepts of leisure time in recreation. Historical development of forest recreation. Forestal outdoor resource. Development, management, and administration of forest recreation areas and systems.

3320 Principles of Silviculture (3) Influence of site factors on reproduction, growth, development, and character of forest vegetation; classification of forest structure; silvicultural laws. Prereq: 3020 or Biology 2130, 3040, Plant and Soil Science 2130. 3 hrs.

3730 Conservation (3) Forest resources of state, nation, and world; forests in soil and water conservation; wildlife management and recreation; conservation programs.

4002 Utilization (3) Wood-using industries; processing of forest products for sawing, veneer, lumber, grading; pulpwod operations, flooring plants, treating plants, plant layout, flow diagrams. Prereq: 3120.

4003 Field Methods of Timber Inventory (4) Field measurement of timber stands; time required for determining appropriate sample design for specific purposes, tree and stand growth; site evaluation; field problems. Prereq: 3110 and Agriculture, Mechanization 3140.

4004 Forest Practice (3) Management of forest lands by public and private organizations; "multiple-use" concept as it influences management decisions; impact of public pressure for outdoor recreation on management decisions; management prescriptions. Prereq: 4006. Satisfactory-No Credit.

4006 Silvicultural Methods (4) Methods and application of intermediate and regeneration cuttings; site preparation, planting and seeding; modifications of cutting methods to obtain desired goods and benefits. Prereq: 3320.

4020 Forest Watershed Management (3) Water as a forest resource; role of forests in the hydrologic cycle; control of water quality, quantity, and regimen; watershed planning. Prereq: 3020 or permission of instructor. Prereq: 3 hrs., 2 weeks field trips.

4110-20-30 Problems in Forestry (1-4, 1-6, 1-6) Special research or individual problems in forestry. Prereq: Senior standing. Total not more than 9 hrs.

4210 Forestry Organization and Administration (3) Forestry organization; planning concepts and themes of organization; decision-making in forest resource management. Prereq: Junior Field Session.

4220 Forest-Resource Management (4) The forest as integration of resource uses; review of traditional timber-management concepts; the multiple-use concept; valuation of forest resources for decision-making and planning; taxation of forestry firm. Prereq: 4210.

4230 Forest-Resource Management Plans (4) Field problems and case studies in forest-resource management; the forest as a system; management of forest enterprises as a producer of timber, recreational services, watershed services, and wildlife; producing multiple services; preparation of a complete timber management plan based on optimizing forest uses. Prereq: 4220.

4240 Interpreting Forest Resources (3) Principles and techniques of interpreting forest resources; importance of environmental considerations in management of forest resources; development and administration of interpretive services. Possible overnight field trips required. Prereq: 3240 or equivalent.

4330 Forest Policy (3) History of forestry in United States with emphasis on development of forest re-
source policies; current policies influencing development and management of forest resources; brief survey of policy implications of forest resource 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 aerial photographs, inventory of forested areas, assessment of forest condition, determination of stand characteristics, and assessment of forest stands. Prereq: Civil Engr 4260 and Forestry 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 cytology and population genetics; identification and description of superior trees, evaluation of results of selection, selection of superior genotypes and development of seed orchards; hybridization; seed production and seed certification. Prereq: 4006, Botany 1120. 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, soils, climate and weather, soils, trees, silvicultural problems and silvicultural characteristics of the more important species. Prereq: 4006 and 4210.

4440 Forest Recreation (3) Forest lands as a recreation resource, interrelationships of forest recreation and other management activities; development and management of forest recreation areas; socio-economic and political determinants of recreation development and management. Prereq: 6 credits in sociology and/or economics. Junior standing. 2 hrs and 1 lab.


GRADUATE

5000 Thesis

5110 Special Problems in Forestry (1-6)

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 Associated Lands (3)

5310 Seminar (1) WILDLIFE AND FISHERIES SCIENCE (993)

3200 Wildlife Resources and Their Conservation (3) Wildlife resources of the United States; their interrelationships with soil, water, and forests and other plant life; contribution to economic and social development; management of animal species. Prereq: junior standing. General course for non-wildlife and fisheries majors.

3230 Wildlife Management (3) (Same as Forestry 3230)

4110 Problems in Wildlife and Fisheries Science (1-4) Special research or problems in wildlife and fisheries science. Prereq: Senior standing. May be repeated. Maximum credit 9 hours.

4450 Game Mammals (4) Classification, identification, distribution, natural history, and management principles of game mammals in North America. Prereq: 3230 or one year of Zoology. 2 hrs and 2 labs.

4460 Game Birds (4) Biology, classification, identification, distribution and management of game birds in North America. Prereq: 3230 or one year of Zoology. 2 hrs and 2 labs.

4500 Problems in Wildlife and Fisheries Sciences (1-6) Special research or individual problem in wildlife and fisheries science. Prereq: senior standing. May be repeated to maximum of 9 hours credit.

4510 Freshwater Fishery Biology (4) Principles and methods of fish population estimation; population dynamics, sampling techniques and equipment in warm and cold-water environments as commercial and sport fisheries. Prereq: 1 year biology and 8 hrs mathematics, or consent of instructor. 3 hrs and 1 lab or field period. (Same as Zoology 4510).

4520 Management of Lakes and Ponds (4) Principles and methods of lake and pond management for commercial and sport fishes; design, renovation, and stocking procedures; biology and culture of management species. Prereq: 1 year biology and consent of instructor. 3 hrs and 1 lab or field period.

4600 Seminar (1) Review of literature. Oral and written reports. Prereq: senior standing. May be repeated to maximum of 3 hours credit.

GRADUATE

500 Thesis

5110 Special Problems in Wildlife and Fisheries Science (1-6)

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)

Ornamental Horticulture and Landscape Design (740)

Professors: D.B. Williams (Head), Ph.D. Pennsylvania State; N.D. Peacock (Emeritus), Ph.D. Michigan State.

Associate professors: J.S. Alexander, M.S. Tennessee; L.M. Callahan, Ph.D. Rutgers, M.S. Michigan State, Horticulture College (Frederiksoord, Holland)

Assistant Professors: J.W. Day, Ph.D. Mississippi State; G.L. McDaniel, Ph.D. Iowa State.

3010 Landscape Gardening (3) Home ground organization and beautification; identification and use of ornamental plants; principles of planning; preparation of plans. 1 hr and 2 labs.

3020 Home Grounds Management (3) Techniques involved in managing plants around the home; outdoor propagation, transplanting, planting site selection and preparation, mechanical and chemical plant growth control, lawn care practices, and recognition of plant ailments; tools and equipment necessary to carry out management techniques. 1 hr and 2 labs.

3030 Plant Propagation (3) Physiology, methodology, and environmental requirements for propagation. 2 hrs and 1 lab.

3040 Floral Design (3) Principles and techniques in flower arranging with emphasis on arrangements for home, church, and special occasions. 1 hr and 2 labs.

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

3810-20 Plant Materials (3, 3) Identification, culture, adaptation, and landscape design values of woody ornamental trees, shrubs, vines. Need not be taken in sequence. Prereq: Botany 1130 or Biology 1230. 3 labs.

3830 Plant Materials (3) Classification, identifying features, native habitat, adaptation, and main-ripened genetic changes of herbaceous plants grown as greenhouse crops, bedding plants, or perennial landscaping plants. Prereq: Botany 1130 or Biology 1230, or permission of instructor. 1 hr and 2 labs.

4120 Landscape Design I (4) Design and development of properties; planning, organization, structure, selection and use of plant and structural materials, methods of presentation, specifications. Prereq: Senior standing and permission of instructor. 2 hrs and 2 labs.

4140 Landscape Design II (4) Advanced theory of design. Pictorial and abstract approach to landscape design. Emphasis on recreational design; analysis of contemporary trends and objectives to projected needs and development of plans. Prereq: Senior standing and permission of instructor. 2 hrs and 2 labs.

4150-60 Nursery Management I and II (3, 3) Production, labor and sales management; retail and wholesale nurseries; locations, layout, culture, equipment and facilities. Need not be taken in sequence. Prereq: 3030; Botany 1110. 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: 4120. 4140 recommended. 2 hrs and 2 labs.

4210 Principles of Turf Management (4) Principles of turfgrass management; history, varietal selection and identification, adaptation, ecology, physiology, soil fertility and grass nutrition; basic applied fertility programs and weed control; and pest identification and control relationships in turf grasses and basic pest control programs. Prereq: Plant and Soil Science 2130 and 8 hours of biological sciences.

4310 Floriculture I (3) Principles and practices employed in producing cut flower crops. Application of principles of plant physiology as they control flowering, plant quality, and harvesting schedules. Prereq: 3110; Plant and Soil Science 3040 or equivalent. 2 hrs and 1 lab.

4320 Floriculture II (3) Principles and practices employed in producing floricultural crops in pots and other containers. Analysis of problems associated with growing plants in a very restricted soil volume under controlled greenhouse conditions. Prereq: 3110; Plant and Soil Science 3040 or equivalent. 2 hrs and 1 lab.

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

4610 Seminar (1) Current problems in Ornamental Horticulture and Landscape Design. Prereq: Junior standing and permission of instructor.

GRADUATE

5000 Thesis

5011-21 Special Problems in Lieu of Thesis (3-5, 3-5)

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)

5500 Seminar (1) Plant and Soil Science (792)

Professors: L.F. Seatz* (Head), Ph.D. North Carolina State; F.F. Bell, Ph.D. Iowa State; H.A. Fribourg, Ph.D. Iowa State; L.M. Johnson, Ph.D. Wisconsin; W.L. Parks, Ph.D. Purdue, B.S. Pickett (Emeritus); Ph.D. Michigan State; L.M. Skold, M.S. Kansas State; M.J. Springer, Ph.D. California (Berkeley); H.D. Swingle, Ph.D. Louisiana State.


Institute of Agriculture
College of Veterinary Medicine

Willis W. Armistead, Dean

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

The College is organized in 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 consequently are qualified to pursue careers in many facets of veterinary medicine and related health professions.

Most American 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 is 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 is 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 animal diseases.

Excellent opportunities exist also for veterinarians interested in research—both research for the direct benefit of animals and research conducted with animals but for the benefit of man. 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 in Morgan Hall on the Agricultural Campus. The Department of Animal Science is housed in Brehm Animal Science Building, also on the Agricultural Campus, and the Department of Microbiology is located in Heiser Biology Building on the main campus of the University of Tennessee, Knoxville.

The remainder of the College will be housed in a large teaching hospital which is under construction and scheduled for
occupancy in 1978. In the interim, the Departments of Environmental Practice and Urban Practice are housed in McCord Hall on the Agricultural Campus. Headquarters of the Department of Pathobiology temporarily is in Morgan Hall.

The College also is developing research farm facilities at Knoxville and several satellite teaching-research facilities 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 following minimum prevetinary requirements:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Minimum Credits</th>
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<tr>
<td>English, including speech</td>
<td>12</td>
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<tr>
<td>'Humanities'</td>
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<td>'Social Sciences'</td>
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<tr>
<td>Mathematics through calculus</td>
<td>12</td>
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<tr>
<td>Chemistry, general</td>
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<td>Biology or zoology</td>
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<td>Microbiology</td>
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<td>Animal Science, including</td>
<td>13</td>
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<tr>
<td>nutrition and genetics</td>
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120 Quarter
80 Semester

Prevetinary requirements may be completed in any accredited college or university which offers courses equivalent to those at The University of Tennessee.

The College of Agriculture of The University of Tennessee offers an excellent 3-year prevetinary curriculum which satisfies all the course requirements for admission to the College of Veterinary Medicine. (For description see Prevetinary Medicine Curriculum, College of Agriculture.) Students who are admitted to the College of Veterinary Medicine following completion of this prevetinary curriculum will receive a Bachelor of Science degree in Animal Science upon completion of the first year (3 quarters) of the professional veterinary medicine curriculum. (For the specific description see Prevetinary Medicine Curriculum, College of Agriculture.)

Admission Procedure

Admission of new students will be for the fall quarter each year. Applicants will be screened carefully by a faculty committee to determine those best qualified for admission within the College enrollment quota.

Applicants will be considered in the following order of priority: (1) residents of Tennessee; (2) legal residents of states with which the University of Tennessee has contracts for veterinary medical education; (3) residents of other states or foreign countries.

Forms and instructions for making application for admission may be obtained from:
Office of the Dean
College of Veterinary Medicine
P.O. Box 1071
Knoxville, Tennessee 37901

Applications must be completed and mailed so as to reach the Director of Admissions before February 1 each year. All prevetinary requirements must have been completed before the student enrolls in the College of Veterinary Medicine.

Course Load

The professional curriculum of the College of Veterinary Medicine requires a specific number of hours for each quarter. A student may enroll for fewer or more than that number only with the permission of the Dean. Because of the sequential and highly integrated character of the professional curriculum, all courses in a given quarter are considered prerequisite to those in the succeeding quarter.

Professional Curriculum

The professional curriculum in veterinary medicine is a three-year, year-round program, including summers. The first year (3 quarters) consists mostly of preclinical subjects such as anatomy, physiology, microbiology, parasitology, and general pathology. The second year (4 quarters) includes the study of diseases, their causes, diagnosis, treatment, and prevention. The final year (4 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, medical communication, professional ethics, jurisprudence, economics, and practice management.

FIRST YEAR

Fall Quarter

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<th>Subject</th>
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Winter Quarter

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Spring Quarter

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19 hours
TOTAL 57 hours

*Includes history, literature, music or art appreciation, philosophy, religion or foreign language.
*Includes economics, anthropology, political science, psychology, sociology and geography.

Departments of Instruction

Veterinary Animal Science (992)

For listing of faculty and courses outside the veterinary medicine curriculum see Department of Animal Science, College of Agriculture.

8240-50 Veterinary Physiology (3,4) 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: respiratory, cardiovascular, digestive, and genito-urinary, etc. Three hours of lecture for 8240; 4 hours of lecture for 8250.

8510-20 Histology (4,4) Microscopic anatomy of respiratory, cardio-vascular, digestive, urinary, and reproductive systems; integument, and special sense organs. Sequence of presentation as listed above. Correlated with 8240-50. Two hours of lecture and two laboratories.

8540-50 Gross Anatomy (4,4) Gross anatomy of common domestic species. Lecture; dissection of embalmed specimens; study of prosections, slides, models and living animals. Cardio-vascular and respiratory systems are first in sequence. Correlated with 8510-20 if possible. One-hour lecture and two laboratories.

Environmental Practice (346)

Professor: H. Kitchen (Head), D.V.M. California (Davis), Ph.D. Florida.
Associate Professor: J.W. Oliver, D.V.M., Ph.D. Purdue.
8611-12 Pharmacology (1,2) Theories of transport across membranes. Introduction to principles of drug action and distribution. Receptor theory, adverse drug reactions; correlated with Animal Science 8240-50. One-hour lecture for 8611; Two hours of lecture for 8612.

Veterinary Microbiology (996)

For listing of faculty and courses outside the veterinary medicine curriculum see Department of Microbiology, College of Liberal Arts.

8101 Microbiology I (5) Part I, Basic microbiology; microbial structure, metabolism, macromolecules and genetics. Part II, Immunology; nonspecific and specific humoral and cellular host response to infection (and "foreign" material), immunopathology, and certain aspects of immunogenetics (e.g., transplantation). Three hours of lecture and two laboratories.

8102 Microbiology II (3) Part I, Bacterial pathogenesis: disease patterns and mechanisms of bacterial pathogenesis related to their properties including cell wall, capsules, enzymes and other bacterial products. Part II, Viral pathogenesis: disease patterns and mechanisms of viral pathogenesis related to their properties including acute, latent, and "slow virus" infections, and cancer. Two hours of lecture and one laboratory.

8103 Microbiology III (3) Part I, Viral pathogenesis continued. Part II, Medical mycology: disease patterns and mechanisms of pathogenesis of yeasts, molds and "imperfect" fungi, related to their properties, including spores, conidium, etc. Two hours of lecture and one laboratory.
Pathobiology (742)

Professor:
R.L. Michel (Head), V.M.D. Pennsylvania, Ph.D. Michigan State.

8710 Veterinary Pathology (3) Principles of pathobiology including causes of disease, disturbance of cell growth, inflammation, and neoplasms; introduction of clinical hematology. Three hours of lecture and three laboratories.

8730 Veterinary Parasitology (3) Basic principles of parasitology, protozoology, helminthology, and entomology and their relation to disease in animals. Two hours of lecture and two laboratories.

Rural Practice (870)

Professors:

Associate Professors:

Urban Practice (886)

Professor:
E.D. Gage (Head), D.V.M. Texas A & M.

Associate Professors:

Interdepartmental Offerings

Veterinary Medicine (989)

8010 Professional Relations (1) Professional speaking and writing, research design and data interpretation, and public relations. One-hour lecture.

8310 Introduction to Veterinary Medical Practice (2) Species, breed identification; basic care, feeding, restraint and handling, introduction to physical diagnosis, intravenous techniques, blood sampling, etc. One-hour lecture and one laboratory.

8311 Introduction to Veterinary Medical Practice (2) Physical diagnosis, history taking, and client relations; anesthetic principles, agents, and techniques. One-hour lecture and one laboratory.

8312 Introduction to Veterinary Medical Practice (2) Basic surgical principles, preparation for surgery, wound healing and suturing; fundamentals of radiology. Correlated with 8320. Two hours of lecture and one laboratory.

8320 Medical Science Interactions (2) Multidiscipline laboratory. Demonstrations and surgical experiments to illustrate variety of physiologic and pharmacologic principles. Emphasis on anesthetic techniques, basic clinical chemistry, i.e., acid-base, provides appreciation for survival and emergency techniques and for drug action. Correlated with 8312. Two hours of lecture and one laboratory.