

# Department of Agriculture and Natural Resources

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## Faculty

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## Mission

The primary mission of the Department of Agriculture and Natural Resources is to provide a high quality undergraduate education leading to bachelor of science degrees in either agriculture or natural resources management. Both programs are distinctive, in that students are exposed to all principal disciplines within each program and have the flexibility to choose a concentration of courses in a discipline that interests them. Students in each program have opportunities to obtain field experience, prepare for postgraduate studies, and engage in scholarly and professional activities. The department offers – completely by distance delivery – a master of science degree in agricultural operations management, designed to prepare working agriculture and natural resources professionals for career advancement (see Graduate Study section). Both faculty and students engage in public service and limited applied research related to the needs of the region.

## Majors

The bachelor of science degree programs in agriculture and in natural resources management include the following majors, areas of concentration, and options. The professional education option within agricultural science is accredited by the National Council for the Accreditation of Teacher Education.

### **Bachelor of Science in Agriculture (with a major in General Agriculture)**

#### **Concentrations**

**Agricultural Business (1111)**

**Agricultural Science (Non-Licensure and Professional Education Options) (1112, 1113)**

**Animal Science (Production and Management, Business, and Science options) (1119, 1117, 1115)**

**Plant and Soil Science (Crop and Soil Management and Turf and Golf Course Management Options) (1121, 1122)**

### **Bachelor of Science in Natural Resources Management (with a major in NRM)**

#### **Concentrations**

**Environmental Management (1154)**

**Park and Recreation Administration (1151)**

**Soil and Water Conservation (1152)**

**Wildlife Biology (1153)**

The bachelor of science in agriculture degree includes a set of general education requirements, common agricultural core requirements, and concentration requirements for a major field. Students will meet general education requirements for aesthetics, biological and physical systems, communications and computer literacy, ethical awareness, global dynamics, mathematics, and social dynamics. It requires completion of 124 semester hours of course work. Course requirements during the first two years are similar to those of other universities, a feature that facilitates transferring to or from other universities and community colleges. After completing basic courses in agriculture and supporting subjects, students may elect an area of concentration according to their interests. Each concentration provides a broad general education and excellent preparation for advanced study.

The bachelor of science in natural resources management also includes general education requirements, common natural resource management core requirements, and concentration requirements for a major field. Each of the major field concentrations is designed to provide a broad general education in management of natural resources as well as specialization in the major field. Completion of any of these curricula with selection of proper electives provides an excellent foundation for graduate study.

All of the curricula available in Agriculture or Natural Resources Management include elective courses to allow flexibility in selection of courses according to interests of the individual student. Electives must be selected by the student with consultation and approval of his/her academic adviser. Many courses include field trips to, and work experiences with, leading agricultural businesses, farms, and resource management agencies such as state and national parks and wildlife refuges. Thus, students have an opportunity to observe proper application of new concepts and information, technology, and principles of management to real-life situations. The master of science in agricultural operations management degree is described in the graduate section of the catalog.

## **Pre-Professional Programs**

In addition to the degree programs mentioned above, UT Martin offers these pre-professional programs:

**Agricultural Engineering (1131)**

**Forestry (1133)**

**Veterinary Medicine (1135)**

After completing two or three years of basic studies at UT Martin, students interested in one of these curricula may transfer to other universities offering advanced study leading to a degree in their chosen area of interest.

## **Minors**

Minors are available in Agriculture and in Park and Recreation Administration for students who are completing the university's bachelor of arts or bachelor of science degrees (see preceding section). The minor in agriculture consists of Agricultural Economics 110, Agricultural Engineering Technology 110, Animal Science 110, Plant Science 110, and 12 semester hours of study in agriculture-related courses numbered 300 or above (excluding courses designated as Natural Resources Management, Wildlife Biology, or Park and Recreation Administration). Agriculture faculty will provide advice and counsel as requested by students or their academic advisers to assist in selecting courses that are appropriate to each student's goals and objectives.

The minor in park and recreation administration consists of Park and Recreation Administration 100, 110, 200, and 12 hours of upper-division Park and recreation Administration courses selected from Park and Recreation Administration 300, 310, 321, 400, 430, and 440. Two hours from courses designated as Natural Resources Management 200 or 301 and 302 may be applied toward the upper-division park and recreation administration requirements.

Agriculture and natural resources management students wishing to complete an optional minor in a second degree area are invited to do so. All requirements for the minor as set forth by the granting department must be met. Minors are available through a number of different departments on campus.

## **Facilities**

The Martin Agricultural Experiment Station and the Agricultural Field Teaching/Demonstration Complex, located adjacent to the campus, are utilized as the laboratory farm in the department's teaching programs. Together, both units comprise 680 acres and include herds of beef cattle, sheep, goats, horses and swine, as well as greenhouses and landscape, wildlife, field and forage crop demonstration areas. These facilities are used by faculty and students to conduct research that complements the teaching program as well as contributes to the broad objectives of the UT Agricultural Experiment Station.

The organization outlined above enables students to become familiar with research conducted at the Martin Agricultural Experiment Station, other experiment stations of the UT Institute of Agriculture, and other laboratories of the university. UT Martin in this way occupies a unique position that differentiates it from other institutions.

UT Martin also has the Ned McWherter Agricultural Complex (which includes a stalling facility) and an Equine Center and Rodeo Practice Facility where students can board their horses.

## **Student Organizations**

Agriculture and natural resources management students are active in several organizations which include the Agronomy Club, Alpha Gamma Rho, Alpha Zeta, Block and Bridle Club, Collegiate FFA, Collegiate 4-H, National Agribusiness Marketing Association, Park and Recreation Adventure Club, Equestrian Club and Team, Rodeo Team, UT Martin chapter of the Wildlife Society and UT Martin Pre-Veterinary Club. These student organizations provide opportunities for meeting established professionals in the field, enhancing leadership skills, and participation in social activities.

## **Cooperative Education Program**

The department participates in the UT Martin Cooperative Education Program that provides students an opportunity to gain valuable professional experience while preparing for career employment or graduate study. This program is designed so that students spend alternate semesters in study on campus and employment with an approved business or agency. Students majoring in any of the curricula offered in agriculture or natural resources management, as well as agricultural engineering, are eligible to participate in the program, provided they demonstrate satisfactory academic and on-the-job performance. Participants in the program should allow five years to earn the baccalaureate degree; however, they will obtain two years of valuable field experience and salary while employed. For further information, see "Cooperative Education" section of catalog, or write: Coordinator, Career Services, or Dean, College of Agriculture and Applied Sciences, UT Martin, Martin, Tennessee 38238.

## **Internship Programs**

Supervised field experience, or an internship, is available for academic credit. It is required of all students in park and recreation administration, and strongly encouraged for students in all other agricultural and natural resources management degree programs. Internships are designed to enable a student to obtain credit for completion of a prescribed program of work with an approved business or agency. Students have served as interns in a variety of agricultural management and marketing positions and as interns with a variety of city, state and federal agencies.

Supervision and evaluation are provided by faculty and on-the-job supervisors. An essential element of this program is that the work experience be designed so it contributes to a student's learning and level of competence in his/her chosen career area; routine summer jobs or seasonal employment that do not meet these criteria cannot be considered for internship credit. Students interested in the program should apply for participation one semester in advance, and they should have achieved senior standing at the time the work experience begins in the case of park and recreation administration—and junior standing in the case of other concentration areas.

## **Judging Teams**

Teams composed of students enrolled in agriculture or natural resources management annually participate in intercollegiate contests in livestock judging, crops judging, horse judging, and land evaluation. Instruction and coaching are provided by faculty members, and membership on the team is based upon participation and competitive performance in practice exercises. The teams have received awards in regional and national competition. They provide excellent opportunities for interested students to sharpen their evaluation skills. Intercollegiate equestrian competition is also available to interested students.

**Bachelor of Science in Agriculture***I. General Education Requirements (35 hours)*

Aesthetics . . . . .	3
One course from: Art 110; Art History 210, 211; Dance 110, 111; Music 111, 112; Theatre 110, 111	
Biological and Physical Systems . . . . .	8
Biology 110, 120	
Communication and Computer Literacy . . . . .	12
Communications 230; Computer Science 201; English 111, 112	
Ethical Awareness . . . . .	3
Philosophy 160	
Global Dynamics . . . . .	3
One course from: Agriculture 295 (required for Agricultural Business and Plant and Soil Science concentrations); English 250, 251, 260, 261, 270, or 271 (required for Agricultural Science Professional Education Option); Geography 151, 152, 202; History 121, 122, 201, 202	
Mathematics . . . . .	3
Mathematics 140	
Social Dynamics . . . . .	3
One course from: Economics 100; Engineering 100; Interdisciplinary Studies 201; Philosophy 130; Political Science 210; Psychology 120 (required for Agricultural Science Professional Education Option); Social Work 220; Sociology 201	

*II. Agriculture Common Core Requirements (29 hours)*

Agriculture . . . . .	18
Agriculture 390, Agricultural Economics 110, Agricultural Engineering Technology 110, Animal Science 110, Plant Science 110, Soil Science 210	
Science and Mathematics . . . . .	11
Chemistry 121, 122; Mathematics 160 or 210	

*III. Concentration Requirements (60 hours)*

(See respective concentrations on the following pages.)

Total hours required for degree: . . . . .	124
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## Agricultural Business Concentration (1111)

This curriculum is designed to prepare students for careers in the rapidly expanding agricultural business sector. Students receive instruction in the agricultural sciences, agricultural economics, accounting, finance, marketing, computers, and management. Students learn how the economic system operates as well as the role agriculture plays in the U.S. and global economy. The program emphasizes training related to the management phases of agricultural industry and business. Excellent career opportunities are available in industries allied with agriculture, including those engaged in transportation, distribution, marketing, and processing of farm products; agricultural banking and farm credit agencies; farm real estate and land appraisal services; insurance; agricultural supply businesses and cooperative management; agricultural policy at state and federal levels; market analysis and reporting; and communications.

### CONCENTRATION REQUIREMENTS (60 Hours)

Accounting 201-202 . . . . .	6
Agriculture 295 (if not taken to meet Global Dynamics requirement ) . . . . .	3
Agricultural Economics 210, 325, 364, 375, 445, 465, 471. . . . .	1
Agriculture/Natural Resources Management Electives . . . . .	9
Business Electives chosen from Business Law 201, Finance 301, Management 301, and Marketing 301 . . .	6
Economics 201, 202 . . . . .	6
Mathematics 160 or 210 (whichever is not taken under Agriculture Common Core Requirements). . . . .	3
General Electives . . . . .	9

## **Agricultural Science Concentration (1112, 1113)**

The program provides technical expertise that prepares students to assume a variety of agriculture-related positions in rural or urban communities. The curriculum is designed for those who desire to own or manage farms; become agricultural representatives for banking and financial institutions, cooperatives, chemical companies, the Agricultural Extension Service, and other federal agencies and state agencies; or to engage in public relations, research, and other aspects of industry related to agriculture and agribusiness.

### **Professional Education Option**

This agricultural science option is offered in cooperation with the College of Education and Behavioral Sciences, and graduates meet certification requirements to teach high school agricultural education and agriscience. The option is designed especially to prepare students as professional agricultural educators. Graduates are prepared to assume leadership roles in other segments of the agricultural industry related to public relations, sales, communication, manufacturing, and government service. It is possible to obtain add-on endorsements in the secondary education (7-12) areas such as biology and chemistry.

#### **CONCENTRATION REQUIREMENTS (60-65 hours)**

##### **Agricultural Science Core Courses (16 hours)**

Management Elective in Agriculture.....	3
Agricultural Engineering Technology 220.....	3
Animal Science 240.....	3
Animal Science 340 or 350.....	3
Microbiology 251 or 310.....	4

##### **Non-licensure Option (44 hours)**

Agricultural Economics 325.....	3
Agricultural Engineering Technology 350.....	3
Animal Science 360 or Plant Science 431.....	3
Chemistry 310.....	3
Economics 202.....	3
English or Communications Speaking or Writing Elective.....	3
Plant Science 433.....	3
Soil Science Elective.....	3
Zoology 325.....	3
Agriculture/Natural Resources Management Electives.....	17

OR

##### **Professional Education Option (49 hours)**

Agriculture 450.....	3
Agricultural Education 310*, 404*, 405*.....	15
Agricultural Education 470.....	3
Agricultural Engineering Technology 210, 370.....	6
Animal Science 119.....	1
English Literature elective (meets Global Dynamics requirement) English 250, 251, 260, 261, 270, 271....	3
Human Learning 311.....	3
Plant Science 363 or 365.....	3
Psychology 120 (meets Social Dynamics requirement).....	3
Reading 433.....	3
Special Education 300.....	3
Teacher Education 301, 302*, 303*, 401*.....	9

\*Admission to Teacher Education required. See section on "Requirements for Recommendation for Licensure."

## **Animal Science Concentration (1119, 1117, 1115)**

This curriculum introduces students to the many facets of the animal industry. Students then orient themselves toward a career in animal production, animal science and industry, or veterinary medicine by selecting one of the three options available.

The production and management option (1119) is designed for students most interested in a terminal bachelor of science degree. The science option (1115) better prepares students for post-baccalaureate training in graduate or professional schools (including veterinary medicine). The business option (1117) prepares the student for management positions in animal science entrance into the master of business administration degree. The option requirements are generally started in the junior year to allow individual flexibility in selecting the degree track best suited for each individual student.

Students may also complete requirements for a minor in business administration, biology or chemistry by completing course requirements as outlined by each of these respective departments.

The animal science concentration is comprehensive and includes training in animal nutrition, physiology, breeding and reproduction, selection and evaluation, management, marketing, animal health and welfare, and biotechnology. Training is provided through classroom instruction, hands-on experience in laboratory and field production facilities associated with the University and University of Tennessee Institute of Agriculture Experiment Stations, tours to commercial farms, ranches, businesses, and marketing and processing facilities. Optional industry-oriented internships and cooperative education experiences allow students to strengthen their training and education in a specific area of animal science and develop contacts with potential employers. New equine facilities, recently renovated beef research units and a state-of-the-art swine teaching and research unit give students interested in production and management the opportunity to acquire skills associated with modern production practices.

Excellent employment opportunities exist in career fields that include: private farming or ranching and commercial farm or ranch management and teaching; research and extension opportunities in both federal or state agencies; and government including the United States Department of Agriculture and University of Tennessee Agricultural Extension Service. Opportunities also exist in private industry in areas of production, technical services, management and marketing for commodity groups and feed, equipment manufacturing, pharmaceutical and food processing corporations; industry and private consulting; environmental and regulatory monitoring; and agricultural finance and communication. Many animal science graduates may continue their education with graduate and professional training in areas such as law, medicine, veterinary medicine, pharmacy, dentistry, business administration and advanced degrees leading to careers in teaching, research and extension.

**CONCENTRATION REQUIREMENTS (60 Hours)**

**Animal Science Concentration Core Courses.....26**

Animal Science 119, 240, 330, 340,  
350, 360, 371, 372.....23  
English or Communications Speaking  
or Writing Elective.....3  
Communications 200, 210; English 305, 310, 315, 325

PLUS

**Production and Management Option.....34**

Agriculture/Natural Resources  
Management Electives.....6  
Any course offering in Agriculture and Natural  
Resource Management excluding Animal Science  
courses and Special Problems or Research Participation  
courses.  
Animal Science Production Requirements.....6  
Animal Science 410, 420, 430, 440  
Animal Science Elective.....3  
Science Requirements.....8  
Chemistry 310 and 319, or 341; Microbiology 251 or 310  
Plant Science and Soil Science UD Electives.....6  
General Electives.....5

OR

**Business Option.....34**

Animal Science Production Requirements.....6  
Animal Science 380, 410, 420, 430, 440  
Science Requirement.....4  
Microbiology 251, 310, or 311  
Business Electives.....21-24  
Accounting 201\* and 202\* or Accounting 300;  
Business Law 201\* or Agricultural Economics 375;  
Economics 201\* and 202\*; Finance 301\* or Agricultural  
Economics 465; Management 301\* or Agricultural  
Economics 471; Marketing 301\* or Agricultural  
Economics 364  
General Electives.....0-3

OR

**Science Option ..... 34**

Animal Science Production Requirements .....6  
Animal Science 410, 420, 430, 440  
Science Requirements ..... 11  
Chemistry 310 and 319 or 341; Microbiology 251 or  
310; Agriculture 441  
Science UD Electives .....8  
Biochemistry, Biology, Chemistry, Mathematics,  
Physics, Microbiology, or Zoology  
Agriculture and Natural Resources Management  
Electives .....9  
Must include one 3-hour course selected from  
Agricultural Engineering Technology, Agricultural  
Economics, or upper-division Plant Science

\*Students completing these courses will complete requirements equivalent to a minor in Business Administration, as well as most undergraduate prerequisites for the UT Martin Master of Business Administration program.

## Plant and Soil Science Concentration (1121, 1122)

Students may choose from two options in this curriculum: Crop and Soil Management and Turf and Golf Course Management.

### Crop and Soil Management Option (1121)

Special studies in many facets of crop production and soil science are emphasized in this curriculum. Studies include soil origin and management, soil resource utilization, plant reproduction including genetics and breeding, fertilizer formulation and use, pesticides, crop management, and ornamental horticulture. Practical applications of basic principles are illustrated with field trips and visits to farms and industries. A student may emphasize technology (production), science, or business phases of the plant and soil sciences according to individual interests, but will meet requirements for certification as a Certified Crop Advisor (CCA), and with the addition of a course in Physics can meet certification requirements for Certified Professional Agronomist (CPAg).

Many career opportunities are available with various federal and state agencies, including the Agricultural Extension Service and Natural Resources Conservation Service. Other opportunities are available in various industries associated with agriculture, including feed, seed, fertilizer, and chemical companies; agricultural supply and equipment companies; agricultural communications and public relations; conservation and recreation; and banking, credit appraisal, sales and production agriculture.

### Turf and Golf Course Management Option (1122)

American culture is experiencing rapid change, and most Americans have more leisure time and discretionary income than ever before. Consequently a growing number of people are interested in playing golf. This has resulted in a sharp demand for more golf courses, in both urban and rural settings. New golf courses are rapidly being built, and this has resulted in a corresponding increase in golf course management positions. The turf industry is also rapidly expanding as new golf courses are being built and established ones are entertaining more golfers and need to be maintained. In addition, a tremendous demand for turfgrass has resulted from new road construction. New building construction, along with an increased emphasis on using turfgrass as a fast efficient way to stabilize soil and beautify landscapes has increased turfgrass demand. Playing fields for football, soccer, baseball, and softball also use turfgrass, as well as playgrounds and parks.

### CONCENTRATION REQUIREMENTS (60 Hours)

#### Plant and Soil Science Requirements . . . . .37

Agriculture 295 (meets Global Dynamics requirement)	
Agricultural Engineering Technology 220 . . . . .	3
Biology 336 . . . . .	3
Botany 421 . . . . .	3
Chemistry 310 . . . . .	3
Microbiology 251 . . . . .	4
Plant Science 322, 333, 431 . . . . .	9
Soil Science 315, 412 . . . . .	6
Zoology 325 . . . . .	3
English or Communications Speaking or Writing Elective . . . . .	3

PLUS

#### Crop and Soil Management Option\* . . . . .23

Agriculture 441 . . . . .	3
Plant Science 433 . . . . .	3
Agricultural Economics Elective . . . . .	3
Agricultural Engineering Technology Elective . . . . .	3
Agriculture Electives . . . . .	11

\*Meets requirements for certification as a Certified Crop Advisor (CCA); students who wish to meet certification requirements for Certified Professional Agronomist (CPAg) should also complete a course in Physics.

OR

**Turf and Golf Course Management Option . . .23**

Agriculture 420 . . . . .6

Plant Science 334, 471 . . . . .6

Restricted Electives . . . . .11

Accounting 300; Agricultural Engineering Technology 210, 350; Agricultural Economics 375; Management 301; Plant Science 305, 341

## **Bachelor of Science in Natural Resources Management**

<i>I.</i>	<i>General Education Requirements (35 hours)</i>	
	Aesthetics . . . . .	3
	One course from: Art 110; Art History 210, 211; Dance 110, 111; Music 111, 112; Theatre 110, 111	
	Biological and Physical Systems . . . . .	8
	Biology 110, 120	
	Communication and Computer Literacy . . . . .	12
	Communications 230; Computer Science 201; English 111, 112	
	Ethical Awareness . . . . .	3
	Philosophy 160	
	Global Dynamics . . . . .	3
	One course from: Agriculture 295; English 250, 251, 260, 261, 270, 271; Geography 151, 152, 202; History 121, 122, 201, 202 (required for Park and Recreation Administration Concentration)	
	Mathematics . . . . .	3
	Mathematics 140	
	Social Dynamics . . . . .	3
	Economics 100	
<i>II.</i>	<i>Natural Resources Management Common Course Requirements (18 hours)</i>	
	Agricultural Engineering Technology 220 . . . . .	3
	Biology 331 . . . . .	3
	Natural Resources Management 100, 210, 390 . . . . .	8
	Soil Science 210 . . . . .	4
<i>III.</i>	<i>Concentration Requirements (71 hours)</i>	
	(See respective concentrations.)	
	Total Hours required for degree: . . . . .	124

## Environmental Management Concentration (1154)

Of all living beings, humans are unique in their ability to manage the environment in which they live. However, modification of the environment to suit human needs often results in the degradation of environmental ecosystems. This curriculum is a science-oriented curriculum designed to provide a broad understanding of environmental quality. Students will develop a solid foundation in basic sciences, mathematics, and communications skills. This foundation will then be applied in courses dealing with ecology and natural resources. Students will be strongly encouraged to pursue relevant work experience through supervised field study with an approved agency or firm.

Graduates of this program will find employment opportunities as technical, scientific, or support personnel with local, state, or federal agencies, or with private industry. Examples include positions with municipal waste treatment facilities; state and federal regulatory agencies; consulting firms involved in environmental remediation and development of impact statements; various manufacturers; environmental and conservation support organizations; and other public and private employers in the environmental field. The curriculum will also prepare the student for graduate study in areas related to the environment and natural resources, including environmental law.

### CONCENTRATION REQUIREMENTS (71 Hours)

Agricultural Economics 445	3
Agricultural Engineering Technology 460	3
Biology 418	3
Chemistry 121, 122	8
Chemistry 310 and 319, or 320	4
English 325	3
Geology 111, 113	8
Geography 280 or 360	3
Geography 472	3
Geology 440	3
Mathematics 160, 210	6
Microbiology 251 or 310	4
Natural Resources Management 350	3
Soil Science 315 or 430	3
Plant Science elective (110, 305, 333, 334, 341, or 422)	3
Science Electives (UD courses in Departments of Agriculture and Natural Resources Management; Biological Sciences; Chemistry; Engineering; or Geology, Geography & Physics)	11
(Natural Resources Management 420 recommended)	

# **Park and Recreation Administration Concentration**

## **(1151)**

This curriculum is designed to prepare students for the proper management of natural, cultural, and recreational resources. Leadership positions in parks and other recreation settings require fundamental knowledge of basic principles from many disciplines which collectively emphasize the natural and cultural sciences as well as personnel and fiscal management, thus preparing students with leadership abilities and an applied understanding of the tools for recreation administration.

Flexibility is provided through restricted elective hours, allowing credit hours to be taken in a more specialized area of the park and recreation field. The curriculum includes supervised field experience with an approved park or recreational agency, and applications are further illustrated by frequent trips to nearby national, state, and municipal park settings and private and commercial recreation attractions.

Employment opportunities include positions with federal, state, and municipal park agencies as well as a multitude of private, commercial and volunteer organizations.

**CONCENTRATION REQUIREMENTS (71 Hours)**

Accounting 201 or 300	.3
Chemistry 100	.4
Criminal Justice 200	.3
Geology 111	.4
Health 320	.3
Mathematics 210	.3
Park & Recreation Administration 100, 110, 200, 300, 310, 400, 430	.31
Plant Science 321, 341	.6
Natural Resources Management Elective	.3
Restricted Electives	.11

Selected with the assistance of the student's adviser based on the student's career goals and taken from the following disciplines: Accounting, Agriculture & Natural Resources, Anthropology, Biology, Business Administration, Business Law, Communications, Computer Science, Criminal Justice, Economics, Finance, Geology, Health/Human Performance, History, Information Systems, Management, and Marketing.

## Soil and Water Conservation Concentration (1152)

Urbanization, industrialization, and population growth demand effective management of land and water resources for multiple uses. This curriculum prepares students for conservation and management of soil and water resources for the long-range benefit of society. Requirements include a strong background in physical and biological sciences, ecology, and management to provide understanding of the physical, chemical and biological interrelationships of soil, water, and plants. Elective courses provide an opportunity for emphasis in areas of particular interest such as ecology, communications, agriculture, economics, political science, and others.

Employment opportunities are available with federal agencies such as Natural Resources Conservation Service and Bureau of Land Management; governmental units including state, county, and municipal agencies; planning and economic development districts; businesses in the agricultural industry, such as fertilizer and chemical companies; public utility companies; and private industry, including banks, financial institutions, and real estate agencies.

### CONCENTRATION REQUIREMENTS (71 Hours)

Agriculture 441 .....	3
Agricultural Economics 110 .....	3
Agricultural Engineering Technology 110, 460 .....	6
Chemistry 121, 122 .....	8
English 325.....	3
Geography 280 or 360.....	3
Geology 111, 113.....	8
Mathematics 160 or 210 .....	3
Microbiology 251 or 310 .....	4
Physics 211.....	4
Plant Science 110, 333, 422.....	9
Soil Science 315, 321, 412.....	9
Soil Science Elective	
(Soil Science 250 recommended) .....	2
General Electives	
(Chemistry 310 recommended for certification) ....	6

## **Wildlife Biology Concentration (1153)**

This curriculum emphasizes basic sciences, plant and animal biology, and communications skills for effective performance as a wildlife biologist. Students learn to view wildlife and problems associated with its management from a broad perspective, while also being exposed to social, cultural, and ethical issues.

Seminar courses and supervised experience in the field with an approved agency provide opportunities for learning management of wildlife populations. Nearby wildlife management areas maintained by state and federal agencies are utilized to illustrate ecology principles.

Graduates are eligible for certification by The Wildlife Society as Associate Wildlife Biologists, and for employment by state wildlife resources agencies, the U.S. Fish and Wildlife Service, and other governmental agencies, as well as private and commercial entities. However, students interested in the more technical phases of this field and in meeting standards for higher managerial positions should plan for graduate study.

### **CONCENTRATION REQUIREMENTS (71 Hours)**

Agricultural Economics 325, 445; Natural Resources Management 375;	
Wildlife Biology 330, 340.....	6
Biology 336, 412, 413 .....	5
Botany 303 .....	3
Botany 421, 431, or Plant Science 341 .....	6
Chemistry 121, 122, 310, 319 .....	12
Mathematics 160, 210 .....	6
Soil Science 315 or 430 .....	3
Wildlife Biology 250, 350, 450.....	11
Zoology 319, 320, 321, 441, 442 .....	13
Agriculture/Natural Resources Management Electives .....	6

## Pre-Professional Curricula in Agriculture

### Agricultural Engineering (1131)

The Department of Agriculture and Natural Resources, in cooperation with the College of Engineering and Natural Sciences, offers a two-year program that is basic to a degree in Agricultural Engineering. After completion of freshman and sophomore years at UT Martin, students may transfer to the University of Tennessee, or another university to complete their junior and senior years.

Agricultural Engineering is the profession that provides engineering know-how for the development of agriculture. Graduates are employed by agricultural colleges in research, teaching, and extension, and by federal agencies such as USDA, the Natural Resources Conservation Service, and the Department of the Interior. Job opportunities are also available in farm equipment design, manufacturing, and sales; building design and construction; electric power systems in agriculture; soil and water conservation engineering; and other industries.

<b>Freshman Year</b>	<b>Hours</b>
Biology 110 .....	4
Engineering 111, 112 .....	4
Engineering 121, 241 .....	6
English 111-112 .....	6
Mathematics 251-252 .....	8
Social Science/Humanities elective .....	3
Total Hours .....	31

<b>Sophomore Year</b>	<b>Hours</b>
Chemistry 121-122 .....	8
Computer Science 201 .....	3
Mathematics 310, 320, 330 .....	10
Physics 220-221 .....	8
Soil Science 210 .....	4
Social Science/Humanities elective .....	3
Total Hours .....	36

**Forestry (1133)**

Forestry is the science, art, and practice of managing natural resources of wood, water, forage, and environmental amenities that occur in association with forest lands. Students interested in preparing for careers in forestry may complete two years of the curriculum at UT Martin. Upon completion of the program outlined below, students may transfer with junior standing to departments of forestry at other universities.

<b>Freshman Year</b>	<b>Hours</b>
Agricultural Economics 110 .....	3
Biology 110, 120 .....	8
Chemistry 121 .....	4
Chemistry 122 or Physics 211 or Geology 111 .....	4
English 111, 112.....	6
Mathematics 140, 160.....	6
Natural Resources Management 100.....	3
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Total Hours.....	34

<b>Sophomore Year</b>	<b>Hours</b>
Communications 230 .....	3
Communications Elective .....	3
Computer Science 201 .....	3
Economics 201.....	3
History Elective.....	3
Humanities Elective .....	3
Mathematics 210.....	3
Wildlife Biology 250.....	3
Soil Science Electives .....	6
Social Science Elective .....	3
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Total Hours .....	33

## Veterinary Medicine (1135)

Students interested in pursuing studies leading to the Doctor of Veterinary Medicine (DVM) degree should complete one of the following programs if not planning to pursue the four-year degree plan in Agriculture (Animal Science-Science option) from UT Martin. This curriculum is designed to qualify students for admission to the College of Veterinary Medicine at the University of Tennessee. Students considering application to other colleges of veterinary medicine should consult those colleges for their residency and admission requirements.

### Animal Science Concentration Requirements Pre-Veterinary Medicine Option 38 hours

35 hours of General Education Requirements and 29 hours of Agriculture Core Requirements and 38 hours of Pre-Veterinary Medicine Option Requirements--102 hours.

Pre-Veterinary Medicine Requirements.....	38 hours
Science Core.....	8
Chemistry 341, 342	
Science Electives.....	20
Agriculture 441; Biochemistry 411, 412; Biology 430; Physics 211, 212	
Animal Science Core.....	7
Animal Science 119, 340, 360 or Biology 336	
Writing Elective.....	3
Communications 200, 210; English 305, 310, 315, 325	

Students who complete this curricula may obtain the Bachelor of Science in Agriculture (Animal Science-Science option) after satisfactory completion of the first year of study in the University of Tennessee College of Veterinary Medicine providing the following provisions are met:

- (a) The last 30 semester hours of the pre-veterinary medicine curriculum must be completed at UT Martin.
- (b) The first year of academic study must be completed in the College of Veterinary Medicine with a cumulative grade point average of at least 2.00.
- (c) Appropriate courses from this year of study will be accepted toward fulfillment of the minimum 124 semester hour graduation requirement.
- (d) Students must have met all other graduation requirements of the UT Martin College of Agriculture and Applied Sciences.
- (e) Students who wish to pursue this option must assume responsibility for completing all graduation requirements and initiating a formal request for granting of the degree.
- (f) Students should check with the Admissions Office of The University of Tennessee College of Veterinary Medicine to insure that courses completed under this option will meet the current admission requirements for the class of which they are submitting their application.

## **Courses Offered by Department of Agriculture and Natural Resources**

- Agricultural Economics 110 Introduction to Agricultural Business (F)  
Agricultural Economics 210 Computer Applications in Agribusiness (F)  
Agricultural Economics 301 Special Problems (F, Sp)  
Agricultural Economics 302 Special Problems (Su)  
Agricultural Economics 325 Agriculture and Natural Resource Policy (Sp)  
Agricultural Economics 335 International Agricultural Trade (as needed)  
Agricultural Economics 345 Agribusiness and Scientific Sales (F)  
Agricultural Economics 364 Agricultural Marketing (F)  
Agricultural Economics 375 Environmental and Agricultural Law (F)  
Agricultural Economics 385 Agribusiness Market Planning (Sp)  
Agricultural Economics 395 Farm Real Estate Appraisal (as needed)  
Agricultural Economics 401 (601) Research Participation (F, Sp)  
Agricultural Economics 402 (602) Research Participation (Su)  
Agricultural Economics 445 (645) Natural Resources Economics (Sp)  
Agricultural Economics 465 (665) Agricultural Finance (Sp)  
Agricultural Economics 471 (671) Agricultural Management (Sp)  
Agricultural Economics 701 Research or Internship in Agricultural Economics (F, Sp, Su)  
Agricultural Economics 715 Advanced Farm Real Estate Appraisal (Su-odd)  
Agricultural Economics 735 Seminar in International Agricultural Trade (Su)  
Agricultural Economics 745 Agricultural Production Economics (as needed)  
Agricultural Education 310 Integrated Agricultural and Agriscience Education Studies (F, Sp)  
Agricultural Education 404 Student Teaching Grades 7-8 (F, Sp)  
Agricultural Education 405 Student Teaching Grades 9-12 (F, Sp)  
Agricultural Education 430-440 (630-640) Problems in Improvement of Instruction (F, Sp, Su)  
Agricultural Education 450-460 (650-660) Problems in Agribusiness and Natural Resources Education (F, Sp, Su)  
Agricultural Education 470 (670) Problems in Agricultural Education (F, Sp, Su)  
Agricultural Education 740 Seminar in Vocational Agriculture for First Year Teachers (as needed)  
Agricultural Education 741 Supervision of Student Teaching in Agriculture (as needed)  
Agricultural Education 770 Program Development for Agricultural Mechanics Instruction (as needed)  
Agricultural Education 771 Program Development for Future Farmers of America Instruction (as needed)  
Agricultural Engineering Technology 110 Introduction to Agricultural Engineering (Sp)  
Agricultural Engineering Technology 210 Internal Combustion Engines (F)  
Agricultural Engineering Technology 220 Surveying and Soil and Water Engineering (F)  
Agricultural Engineering Technology 301 Special Problems (F, Su)  
Agricultural Engineering Technology 302 Special Problems (Sp, Su)  
Agricultural Engineering Technology 310 Food Engineering Technology (as needed)  
Agricultural Engineering Technology 350 Agricultural Power and Machinery Management (F)  
Agricultural Engineering Technology 370 Agricultural Mechanics Shop (F)  
Agricultural Engineering Technology 401 (601) Research Participation (F, Su)

- Agricultural Engineering Technology 402 (602) Research Participation (Sp, Su)  
Agricultural Engineering Technology 450 (650) Agricultural Structures (Sp)  
Agricultural Engineering Technology 460 (660) Waste Management Technology (Sp)  
Agricultural Engineering Technology 482 (682) Precision Technologies for Agriculture and Natural Resources Management (as needed)  
Agricultural Engineering Technology 701 Research or Internship in Agricultural Engineering Technology (F, Sp, Su)  
Agricultural Engineering Technology 710 Safety and Ergonomic Sciences in Agriculture (Sp)  
Agricultural Engineering Technology 760 Comprehensive Nutrient Management Planning and System Design (Sp-odd)  
Agricultural Engineering Technology 781 Agricultural Operations Management Seminar (Su)  
Agricultural Engineering Technology 782 Advanced Precision Technologies for Agriculture and Natural Resources Management (F)  
Agricultural Engineering Technology 784 Agricultural Systems Science (F)  
Agricultural Engineering Technology 785 Decision and Information Systems in Agriculture (Sp)  
Agriculture 120 Science and Technology of Agriculture and Natural Resources (as needed)  
Agriculture 230 International Travel Studies in Agriculture and Natural Resources (as needed)  
Agriculture 295 International Food and Fiber Systems (F, Sp, Su)  
Agriculture 390 Career Planning in Agriculture (F, Sp)  
Agriculture 411 Fundamentals of Cooperative Extension (as needed)  
Agriculture 420 Supervised Field Experience (F, Sp, Su)  
Agriculture 441 (641) Interpretation of of Agricultural Research (F)  
Agriculture 450 (650) Dynamics and Development of Leadership in Natural Resources Management (F, Sp)  
Agriculture 481-482 (681-682) Seminar (as needed)  
Agriculture 720 Research or Internship in Agriculture (F, Sp, Su)  
Agriculture 732 International Travel Study (as needed)  
Agriculture 741 Statistical Methods in Agriculture (as needed)  
Animal Science 110 Introduction to Animal Science (F, Sp)  
Animal Science 119 Introduction to Animal Science Laboratory (F, Sp)  
Animal Science 120 Basic Equitation (as needed)  
Animal Science 195 Equestrian Team (F, Sp)  
Animal Science 210 Introduction to Horse Science (Sp)  
Animal Science 230 Exotic and Companion Animal Management (F)  
Animal Science 240 Live Animal and Carcass Selection and Evaluation (F)  
Animal Science 260 Behavior and Welfare of Farm and Companion Animals (F)  
Animal Science 301 Special Problems (F, Su)  
Animal Science 302 Special Problems (Sp, Su)  
Animal Science 305 Practicum in Animal Science (F, Su)  
Animal Science 306 Practicum in Animal Science (Sp, Su)  
Animal Science 320 Farm Animal Health (Sp)  
Animal Science 330 Basic Meat Science (F)  
Animal Science 340 Basic Animal Nutrition (F)

- Animal Science 350 Applied Animal Nutrition (Sp)
- Animal Science 360 Breeding and Improvement of Farm Animals and Poultry (Sp)
- Animal Science 371 Anatomy and Physiology of Domestic Animals (F)
- Animal Science 372 Applied Animal Reproduction (Sp)
- Animal Science 380 (580) Livestock Merchandising (F)
- Animal Science 400 International Studies in Animal Agriculture (as needed)
- Animal Science 401 (601) Research Participation (F, Su)
- Animal Science 402 (602) Research Participation (Sp, Su)
- Animal Science 410 (610) Beef Sciences (F)
- Animal Science 420 (620) Swine Science (Sp--even)
- Animal Science 430 Stable Management (Sp--odd)
- Animal Science 440 (640) Sheep and Goat Production (as needed)
- Animal Science 441 Advanced Meat Animal Evaluation and Livestock Selection (Sp)
- Animal Science 442 Advanced Meat Animal Evaluation and Livestock Selection (F)
- Animal Science 451 Equine Selection and Evaluation (as needed)
- Animal Science 470 Poultry Science (as needed)
- Natural Resources Management 100 Introduction to Natural Resource Management (F, Sp)
- Natural Resources Management 101 Wildlife, Conservation, and Environmental Issues (Sp)
- Natural Resources Management 200 Interpretive Tours--Practicum (Sp)
- Natural Resources Management 210 Mediating Environmental Conflicts (F)
- Natural Resources Management 230 International Travel Studies in Agriculture and Natural Resources (as needed)
- Natural Resources Management 301 Special Problems (F, Su)
- Natural Resources Management 302 Special Problems (Sp, Su)
- Natural Resources Management 350 Environmental Regulation (Sp)
- Natural Resources Management 375 Environmental and Agricultural Law (F)
- Natural Resources Management 390 Career Planning in Natural Resources Management (F, Sp)
- Natural Resources Management 401 (601) Research Participation (F, Su)
- Natural Resources Management 402 (602) Research Participation (Sp, Su)
- Natural Resources Management 410 (610) Farm Forestry (as needed)
- Natural Resources Management 420 Supervised Field Experience (F, Sp, Su)
- Natural Resources Management 440 (640) Regional Studies in Natural Resources Management (as needed)
- Natural Resources Management 450 (650) Dynamics and Development of Leadership in Natural Resources Management (F, Sp)
- Natural Resources Management 461 Selected Topics in Natural Resources Management (F)
- Park and Recreation Administration 100 Fundamentals of Park and Recreation Administration (F)
- Park and Recreation Administration 110 Park Management (Sp)
- Park and Recreation Administration 200 Recreation Leadership and Programming (Sp)
- Park and Recreation Administration 220 Outdoor Recreation (as needed)
- Park and Recreation Administration 300 Computer Applications in PRA (F, Sp)
- Park and Recreation Administration 310 Recreation Area Design and Comprehensive Planning (Sp)

- Park and Recreation Administration 315 Special Event Management in PRA (as needed)
- Park and Recreation Administration 321 Landscape Management (Sp)
- Park and Recreation Administration 400 (600) Interpretation of Natural and Cultural Resources (F)
- Park and Recreation Administration 410 (610) Financing, Managing, and Marketing Recreation Services (as needed)
- Park and Recreation Administration 430 Supervised Field Experience (F, Sp, Su)
- Plant Science 110 Introductory Plant and Soil Science (F, Sp)
- Plant Science 242 Fundamentals of Horticulture (F)
- Plant Science 250 Crop Evaluation (F)
- Plant Science 260 Landscape Equipment and Technology (Sp)
- Plant Science 301 Special Problems (F, Su)
- Plant Science 302 Special Problems (Sp, Su)
- Plant Science 305 Introduction to Pesticides (Sp)
- Plant Science 321 Landscape Management (Sp)
- Plant Science 322 Introductory Plant Pathology (Sp)
- Plant Science 324 Landscape Construction Techniques (F)
- Plant Science 333 (533) Weed Science (F)
- Plant Science 334 Lawn and Turf Management (F)
- Plant Science 341 Dendrology and Forest Ecology (as needed)
- Plant Science 342 Fruit and Vegetable Production (as needed)
- Plant Science 345 Fruit and Vegetable Products (as needed)
- Plant Science 363 Plant Identification and Propagation (Sp)
- Plant Science 365 Greenhouse Crops and Management (Sp)
- Plant Science 401 (601) Research Participation (F, Su)
- Plant Science 402 (602) Research Participation (Sp, Su)
- Plant Science 422 (622) Forage Crops (Sp)
- Plant Science 431 (631) Principles of Plant Breeding (F)
- Plant Science 433 (633) Field Crop Production (F)
- Plant Science 445 Plants, Environment and Design (Sp)
- Plant Science 462 Environmental Landscape Design (F)
- Plant Science 471 Golf Course Management (as needed)
- Soil Science 210 Soil Science (F, Sp)
- Soil Science 250 Soil and Landscape Evaluation (F, Sp)
- Soil Science 301 Special Problems (F, Su)
- Soil Science 302 Special Problems (Sp, Su)
- Soil Science 315 Soil and Water Conservation (Sp)
- Soil Science 321 Soil Genesis, Morphology and Classification (F)
- Soil Science 401 Research Participation (F, Su)
- Soil Science 402 Research Participation (Sp, Su)
- Soil Science 412 (612) Soil Chemistry and Fertility (F)
- Soil Science 420 Soil Microbiology and Biochemistry (Sp)

Soil Science 421 Soil Microbiology and Biochemistry Laboratory (Sp)

Soil Science 430 Wetland Science (Sp)

Wildlife Biology 220 Wildlife Damage Management (as needed)

Wildlife Biology 250 Principles of Wildlife Management (F)

Wildlife Biology 320 White-tailed Deer (as needed)

Wildlife Biology 330 Wildlife Biopolitics (Sp)

Wildlife Biology 340 Wildlife Law Enforcement and Public Relations (Sp)

Wildlife Biology 350 Wildlife Management Techniques (F)

Wildlife Biology 441 Forensic Techniques in Wildlife Biology (F)

Wildlife Biology 450 Wildlife Habitat Management (Sp)

*Complete course descriptions can be found in the Course Description section of the catalog.*