

School of Agribusiness and Agriscience

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Programs in the School of Agribusiness and Agriscience lead to the Bachelor of Science degree with majors in Agribusiness, Animal Science, and Plant and Soil Science. A concentration in Horse Science is available in the Animal Science major. Certification in Agricultural Education and a concentration in Agricultural Communication are available in each of the three majors. Preparatory programs are also offered for additional study in agricultural engineering, forestry, and veterinary medicine. A minor in Agriculture is available.

A major in the School of Agribusiness and Agriscience requires a minimum of 43 semester hours of courses to include

- a. 21 hours in the major area;
- b. an additional six (6) hours from ABAS as indicated under each major's requirements; and
- c. a general core of ABAS 1000, 1410, 1610, 2210, 3010, and 4100. (ABAS 3010 not required for majors taking YOED 4110 or participating in judging teams.)

Specific course requirements for each major are listed below in the curriculum of that major.

Environmental Science and Technology is an interdisciplinary major and minor offered by Agribusiness and Agriscience, Biology, Chemistry, and Engineering Technology and Industrial Studies. A complete description of this program is found under the Department of Engineering Technology and Industrial Studies.

Curricular listings include General Education requirements in Communication, History, Humanities and/or Fine Arts, Mathematics, Natural Sciences, and Social/Behavioral Sciences categories as outlined on pages 64–67.

Major in Agribusiness

The program leading to a major in Agribusiness is designed for students who are interested primarily in the non-farm phases of agriculture. Specific course requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610	7	ABAS 2130, 2210	6
ENGL 1010, 1020 (Comm)	6	ENGL 2020 or 2030 or HUM 2610 (Hum/FA)	3
BIOL 1030 (Nat Sci)	4	COMM 2200 (Comm)	3
MATH 1010, 1710, or 1730 (Math)	3-4	PSCI 1030 (Nat Sci)	4
Humanities and/or Fine Arts	3	Humanities and/or Fine Arts	3
Social/Behavioral Sciences	3	ECON 2410 (Soc/Beh Sci)	3
Elective	3	HIST 2010, 2020, or 2030	6
	29-30	Elective	2-3
			30-31

JUNIOR		SENIOR	
ABAS 3130, 3010*	6	ABAS 4100, 4190	6
Animal Science elective	3	Agribusiness electives**	6
Agribusiness electives	6	Minor requirements	12
Upper-division electives	6	Upper-division electives	6
Plant and Soil Science elective	3		30
Minor requirements	6		
	30		

*Students taking YOED 4110 or participating in judging teams may substitute ABAS 4480 or 4590.

**Internship courses may not be used to fulfill this requirement.

Concentration: Agricultural Communication

The program is designed to meet the needs of students who are interested in specializing in the communications phase of agriculture. A minor in Mass Communication is required. Specific course requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610	7	ABAS 2130, 2210	6
ENGL 1010, 1020 (Comm)	6	ENGL 2020 or 2030 or HUM 2610 (Hum/FA)	3
BIOL 1030 (Nat Sci)	4	COMM 2200 (Comm)	3
MATH 1010, 1710, or 1730 (Math)	3-4	PSCI 1030 (Nat Sci)	4
Humanities and/or Fine Arts	3	Humanities and/or Fine Arts	3
Social/Behavioral Sciences	3	ECON 2410 (Soc/Beh Sci)	3
Elective	3	HIST 2010, 2020, or 2030	6
	29-30	Elective	3
			31

JUNIOR		SENIOR	
ABAS 3010*, 3130	6	ABAS 4100, 4190	6
Animal Science elective	3	Agribusiness electives**	6
Agribusiness electives	6	Mass Comm minor	3
Plant and Soil Science elective	3	P R 3040	3
Elective	3	EMC/JOUR 4250	3
Mass Comm minor	9	Electives	8-9
	30		29-30

*Students taking YOED 4110 or participating in judging teams may substitute ABAS 4480 or 4590.

**Internship courses may not be used to fulfill this requirement.

Certification in Agricultural Education

Agribusiness majors seeking certification to teach agricultural education in secondary schools (grades 7-12) must complete (1) the Agribusiness major, (2) a minor in Secondary Education, and (3) professional agricultural education courses. Specific course requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610, 2230	10	ABAS 3440, 3600	6
ENGL 1010, 1020 (Comm)	6	ENGL 2020 or 2030 or HUM 2610 (Hum/FA)	3
BIOL 1030 (Nat Sci)	4	Social/Behavioral Sciences	3
MATH 1010, 1710, or 1730 (Math)	3-4	PSCI 1030 (Nat Sci)	4
Humanities and/or Fine Arts	3	Humanities and/or Fine Arts	3
FOED 1110§	3	ECON 2410 (Soc/Beh Sci)	3
	29-30	HIST 2010, 2020, or 2030	6
		FOED 2110§	3
			31
JUNIOR		SENIOR	
ABAS 2210, 3130, 3340	9	Agribusiness electives*	12
COMM 2200 (Comm)	3	Secondary Education minor§	15
ABAS 4190, 4210, 4220, 4230	12	ABAS 4250	3
Secondary Education minor§	6		30
Elective	0-1		
	30-31		

*Internship courses may not be used to fulfill this requirement.
 §Please see page Department of Educational Leadership on page 201 for Secondary Education minor requirements.

Major in Animal Science

The program leading to a major in Animal Science is designed to offer preparation for leadership careers in livestock and related industries. Specific course requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610	7	ABAS 2210	3
ENGL 1010, 1020 (Comm)	6	COMM 2200 (Comm)	3
BIOL 1110 (Nat Sci)	4	ENGL 2020 or 2030 or HUM 2610 (Hum/FA)	3
BIOL 1120	4	CHEM 1010 (Nat Sci)	4
MATH 1010, 1710, or 1730 (Math)	3-4	CHEM 1020	4
Humanities and/or Fine Arts	3	Social/Behavioral Sciences	3
Social/Behavioral Sciences	3	Humanities and/or Fine Arts	3
	30-31	HIST 2010, 2020, or 2030	6
			29
JUNIOR		SENIOR	
ABAS 3130; 3340 or 4310	6	ABAS 4410, 4510	6
ABAS 3010*	3	Animal Science electives**	6
ABAS 4100, 3440, 3420	9	Minor requirements	6
Minor requirements	12	Upper-division electives	9-10
	30	Animal Science/Agribusiness elective	3
			30-31

*Students taking YOED 4110 or participating in judging teams may substitute ABAS 4480 or 4590.
 **Electives must come from the following courses: ABAS 3430, 3470, 3480, 3490, 3500, 3540, 4090, 4470, 4520, 4860.

Concentration: Agricultural Communication

The program is designed to meet the needs of students who are interested in specializing in the communications phase of agriculture. A minor in Mass Communication is required. Specific course requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610	7	ABAS 2210	3
ENGL 1010, 1020 (Comm)	6	ENGL 2020 or 2030 or HUM 2610 (Hum/FA)	3
BIOL 1110 (Nat Sci)	4	COMM 2200 (Comm)	3
BIOL 1120	4	CHEM 1010 (Nat Sci)	4
MATH 1010, 1710, or 1730 (Math)	3-4	CHEM 1020	4
Humanities and/or Fine Arts	3	Humanities and/or Fine Arts	3
Social/Behavioral Sciences	3	HIST 2010, 2020, or 2030	6
	30-31	Social/Behavioral Sciences	3
			29
JUNIOR		SENIOR	
ABAS 3130; 3340 or 4310	6	ABAS 4410, 4510	6
ABAS 3010*, 4100, 3440, 3420	12	Animal Science electives**	6
Mass Comm minor	12	P R 3040	3
	30	EMC/JOUR 4250	3
		Electives	9-10
		Animal Science/Agribusiness elective	3
			30-31

*Students taking YOED 4110 or participating in judging teams may substitute ABAS 4480 or 4590.
 **Electives must come from the following courses: ABAS 3430, 3470, 3480, 3490, 3500, 3540, 4090, 4470, 4520, 4860.

Certification in Agricultural Education

Animal Science majors seeking certification to teach agricultural education in secondary schools (grades 7-12) must complete (1) the Animal Science major, (2) a minor in Secondary Education, and (3) professional agricultural education courses. Specific course requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610, 2230	10	ABAS 2210, 3130, 3440	9
ENGL 1010, 1020 (Comm)	6	ENGL 2020 or 2030 or HUM 2610 (Hum/FA)	3
BIOL 1030 (Nat Sci)	4	Social/Behavioral Sciences	3
MATH 1010, 1710, or 1730 (Math)	3-4	PSCI 1030 (Nat Sci)	4
Humanities and/or Fine Arts	3	Humanities and/or Fine Arts	3
Social/Behavioral Sciences	3	HIST 2010, 2020, or 2030	6
FOED 1110§	3	FOED 2110§	3
	32-33		31
JUNIOR		SENIOR	
ABAS 3340, 3420, 4410, 4510	12	ABAS 4250, 3600	6
COMM 2200 (Comm)	3	Animal Science electives*	6
ABAS 4210, 4220, 4230	9	Secondary Education minor§	15
Secondary Education minor§	6		27
Elective	0-1		
	30-31		

*Electives must come from the following courses: ABAS 3430, 3470, 3480, 3490, 3500, 3540, 4090, 4470, 4520, 4860.
 §Please see page Department of Educational Leadership on page 201 for Secondary Education minor requirements.

Concentration: Horse Science

The Horse Science concentration is designed to meet the needs of persons majoring in Animal Science who wish to emphasize horse science and related courses. Specific requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610	7	ABAS 2210	3
ENGL 1010, 1020 (Comm)	6	COMM 2200 (Comm)	3
BIOL 1110 (Nat Sci)	4	ENGL 2020 or 2030 or	
BIOL 1120	4	HUM 2610 (Hum/FA)	3
MATH 1010, 1710, or		CHEM 1010 (Nat Sci)	4
1730 (Math)	3-4	CHEM 1020	4
Humanities and/or Fine Arts	3	Humanities and/or Fine Arts	3
Social/Behavioral Sciences	3	Social/Behavioral Sciences	3
	30-31	HIST 2010, 2020, or 2030	6
			29
JUNIOR		SENIOR	
ABAS 3010*, 3130, 3340	9	ABAS 3040, 3410, 4090,	
ABAS 4100, 3440, 2400	9	4460	13
Minor requirements	12	Animal Science/Agribusiness	
	30	elective	3
		Minor requirements	6
		Upper-division electives	8-9
			30-31

*Students taking YOED 4110 or participating in judging teams may substitute ABAS 4480 or 4590.

Major in Plant and Soil Science

The program leading to a major in Plant and Soil Science is designed for students interested in agronomy, horticulture, and/or soil sciences. Students may choose to concentrate on either one of these areas within this major. Specific course requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610	7	ABAS 2210	3
ENGL 1010, 1020 (Comm)	6	COMM 2200 (Comm)	3
BIOL 1110 (Nat Sci)	4	ENGL 2020 or 2030 or	
BIOL 1120	4	HUM 2610 (Hum/FA)	3
MATH 1010, 1710, or		CHEM 1010 (Nat Sci)	4
1730 (Math)	3-4	CHEM 1020	4
Humanities and/or Fine Arts	3	Social/Behavioral Sciences	3
Social/Behavioral Sciences	3	Humanities and/or Fine Arts	3
	30-31	HIST 2010, 2020, or 2030	6
			29
JUNIOR		SENIOR	
ABAS 3010*, 3340	6	ABAS 3130, 4100	6
Agribusiness elective	3	Plant and Soil Science	
Plant and Soil Science		electives	9
electives	9	Minor requirements	6
Minor requirements	12	Upper-division electives	10
	30		31

*Students taking YOED 4110 or participating in judging teams may substitute ABAS 4480 or 4590.

Concentration: Agricultural Communication

The program is designed to meet the needs of students who are interested in specializing in the communications phase of agriculture. A minor in Mass Communication is required. Specific course requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610	7	ABAS 2210	3
ENGL 1010, 1020 (Comm)	6	ENGL 2020 or 2030 or	
BIOL 1110 (Nat Sci)	4	HUM 2610 (Hum/FA)	3
BIOL 1120	4	COMM 2200 (Comm)	3
MATH 1010, 1710, or		CHEM 1010 (Nat Sci)	4
or 1730 (Math)	3-4	CHEM 1020	4
Humanities and/or Fine Arts	3	Humanities and/or Fine Arts	3
Social/Behavioral Sciences	3	HIST 2010, 2020, or 2030	6
	30-31	Social/Behavioral Sciences	3
			29
JUNIOR		SENIOR	
ABAS 3010, 3340	6	ABAS 3130, 4100	6
Agribusiness elective	3	Plant and Soil Science	
Plant and Soil Science		electives	9
electives	9	EMC/JOUR 4250	3
Mass Comm minor	9	Mass Comm minor	3
P R 3040	3	Upper-division electives	9-10
	30		30-31

*Students taking YOED 4110 or participating in judging teams may substitute ABAS 4480 or 4590.

Certification in Agricultural Education

Plant and Soil Science majors seeking certification to teach agricultural education in secondary schools (grades 7-12) must complete (1) the Plant and Soil Science major, (2) a minor in Secondary Education, and (3) professional agricultural education courses. Specific course requirements are

FRESHMAN		SOPHOMORE	
ABAS 1000, 1410, 1610,		ABAS 2210, 3440, 3600	9
2230	10	ENGL 2020 or 2030 or	
ENGL 1010, 1020 (Comm)	6	HUM 2610 (Hum/FA)	3
BIOL 1030 (Nat Sci)	4	Social/Behavioral Sciences	3
MATH 1010, 1710, or		PSCI 1030 (Nat Sci)	4
1730 (Math)	3-4	Humanities and/or Fine Arts	3
Humanities and/or Fine Arts	3	HIST 2010, 2020, or 2030	6
Social/Behavioral Sciences	3	FOED 2110§	3
FOED 1110§	3		31
	32-33		
JUNIOR		SENIOR	
ABAS 3130, 3340, 4250	9	Plant and Soil Science	
COMM 2200 (Comm)	3	electives	12
ABAS 4210, 4220, 4230	9	Secondary Education minor§	15
Secondary Education minor§	6		27
Elective	0-1		
Plant and Soil Science			
elective	3		
	30-31		

For certification to teach agriscience, students should see advisor.

§Please see page Department of Educational Leadership on page 201 for Secondary Education minor requirements.

Minor

A minor in Agriculture consists of 18 semester hours, with at least 3 hours at the upper-division level, selected with the approval of the school director.

Pre-Agricultural Engineering

A two-year pre-agricultural engineering program is offered by cooperative agreement with the University of Tennessee and requires two years of study at that school to meet the requirements for a Bachelor of Science degree in agricultural engineering. These courses also may be transferred to programs at other universities.

FRESHMAN		SOPHOMORE	
English 1010, 1020	6	MATH 3110, 3120	7
CHEM 1110, 1120	8	PHYS 2110, 2111	4
MATH 1910, 1920	8	ET 3830, 3840	6
ET 2310, 3360	6	ET 3860, 4970	6
ET 1840	3	ABAS 1610, 3340	6
	31	COMM 2200	3
			32

JUNIOR

Other courses that could be taken at MTSU and transferred include

HIST 2010, 2020	6	MATH 2010	3
Sociology or Psychology	3	ECON 2410	3

Pre-Forestry

A two-year pre-forestry program is offered by cooperative agreement with the University of Tennessee which offers two curricula in forestry:

1. Forest Resource Management
2. Wildlife and Fisheries Science

Two years of additional study are necessary to meet the requirements for a Bachelor of Science degree in forestry. These courses also may be transferred to programs in other universities.

FRESHMAN		SOPHOMORE	
BIOL 1110, 1120	8	CHEM 1010, 1020	8
ENGL 1010, 1020	6	GEOL 1040	4
ABAS 1610	3	ECON 2410, 2420	6
ABAS 3630	3	Literature	3
MATH 1710, 1720	6	MATH 1530	3
PHYS 1300	3	ABAS 3340	3
COMM 2200	3	CSCI 1150	3
	32		30



Preparation for Studying Veterinary Medicine

Students who wish to pursue studies in veterinary medicine should follow the appropriate catalog requirements at institutions offering advanced degrees in the field. The following curriculum will enable a student to continue in a standard veterinary curriculum to complete work for a degree in veterinary medicine:

ENGL 1010, 1020	6
CHEM 1110, 1120	8
BIOL 1110, 1120	8
Humanities and Social Science*	18
PHYS 2010, 2011, 2020, 2021	8
CHEM 3010, 3020	8
BIOL 2120, 4210**	8
CHEM 3530	4
Math***	0-6
	68-74

*May include English literature, speech, music, art, philosophy, religion, language, history, economics, anthropology, medical vocabulary, political science, psychology, sociology, and geography.

**Should have had organic chemistry plus BIOL 1110, 1120, and 2120 prior.

***MATH 1710 and/or 1720 should be taken if student needs background for Physics.

The above requirements represent the very minimum, and those students without an adequate farm background could benefit by taking such agriculture courses as feeds and feeding, elements of animal science, livestock management, livestock production courses, and animal nutrition. An introduction to physiology would also be helpful. Many students who are accepted to a professional veterinary program first complete the four-year Animal Science major at MTSU and earn the B.S. degree

Courses in Agribusiness and Agriscience [ABAS]

Agribusiness

2130 Introduction to Agribusiness. Three credits. Nature, scope, importance, and relationship to the general economy.

3130 Principles of Agricultural Economics. Three credits. Applying the principles of economics to agricultural problems.

3490 Poultry Production and Marketing. Three credits. (Also listed under Agribusiness.) Prerequisites: ABAS 1410; junior-level classification or higher. A comprehensive study of commercial chicken production. Topics include the structure of the U.S. commercial chicken industries; poultry housing and equipment; broiler, broiler breeder, hatchery, and commercial layer management; and poultry/egg processing. Field trips used to supplement course materials. Two lectures and one laboratory. Offered spring only.

3810 Milk Processing and Marketing. Three credits. (Also listed under Animal Science.) Prerequisite: PSCI 1030 or CHEM 1010, 1011, 1020, 1021. Biological, chemical, and physical properties of cow's milk and its value as an animal food source; tech-

niques of processing and marketing; governmental regulations; dairy arithmetic and laboratory testing.

- 4130 Agricultural Marketing and Price Analysis.** Three credits. Prerequisite: ABAS 3130 or approval of instructor. Agricultural prices and their relationship to production and marketing. Agricultural marketing systems, functions, institutions, and structural changes.
- 4140 Economics of Agribusiness Management.** Three credits. Prerequisite: ABAS 3130 or approval of instructor. Application of economic concepts to agribusiness firms.
- 4150 Agricultural Policy.** Three credits. Prerequisite: ABAS 3130. Agricultural policy in a democratic society; relationship of farm groups to public policy; types of agricultural programs and appraisal of their results.
- 4160 Agricultural Cooperatives.** Three credits. Prerequisite: ABAS 3130. Role of agricultural cooperatives in collective bargaining for farmers; historical development, economic organization, and structural aspects.
- 4180 Internship in Agribusiness.** Six credits. Prerequisite: Approval of instructor. In-depth practical experience in a specific area of agribusiness. NOT OPEN TO STUDENTS WHO HAVE RECEIVED CREDIT FROM ANOTHER SCHOOL INTERNSHIP COURSE.
- 4190 International Agriculture.** Three credits. Prerequisite: ABAS 3130. The effect of international trade on the U.S. agricultural industry.
- 4200 Fruit and Vegetable Marketing.** Three credits. (Also listed under Plant and Soil Science.) Prerequisites: PSCI 1030 and BIOL 1030 or approval of instructor. Basic biochemistry of respiration, handling techniques and practices, quality assessment and marketing of fruit and vegetable crops. Both domestic and international marketing of fruit and vegetable products discussed. Examines the economic impact of improper handling on both the local producer and the end user.
- 4810 The Food Industry.** Three credits. An overview from production to processing to marketing. Covers the current status of the world's largest employer, including where and how foods are produced, distributed, and marketed and where the industry is heading in the future.
- 4820 Principles of Food Processing.** Three credits. Prerequisite: PSCI 1030 or CHEM 1010, 1011, 1020, 1021. Principles used in the modern food industry, including thermal, refrigerated, frozen, and irradiation methods. Includes coverage of the techniques used to process major food commodities such as meats, cereal grains, and fats and oils.
- 4830 Food Quality Control.** Three credits. Prerequisites: PSCI 1030 and BIOL 1030 or approval of instructor. Quality control and sensory evaluation techniques utilized in food processing. Instrumental and physical methods of quality determination of raw and processed food products, hazard analysis and critical control point (HACCP), and quality philosophies employed in the industry. Sensory evaluation techniques and statistical analysis of evaluation results covered.

Animal Science

- 1410 Elements of Animal Science.** Three credits. Overview of domestic animal species, including reproduction, genetics, feeding, management, and product marketing. Species include beef, dairy, horses, swine, sheep, goats, and companion animals.
- 2110 Basic Horsemanship.** One credit. Preparation and orientation for students interested in taking horse science courses with an animal handling component. Topics include facility safety, horse control and handling, grooming, saddling, daily care considerations, and facility maintenance. Class consists of one two-hour laboratory each week.
- 2400 Fundamentals of Horsemanship.** Three credits. Concepts of applications of horse handling, particularly the riding horse. Understanding, communicating with, and influencing the equine athlete; development of basic control skills; development of balance and coordination; use of equipment. (First course in a three-part series.)
- 3040 Stable Management.** Three credits. Prerequisite: ABAS 2400 or approval of instructor. Management of a teaching and training stable and the preparation of horses and riders for the show ring.
- 3300 Equine Health.** Three credits. Familiarizes students with normal physiologic parameters and how to recognize and deal with health issues of horses. Topics include care of the pregnant broodmare, foal care, routine health maintenance, infectious diseases, commonly used medications, dentistry, lameness, neurological diseases, colic, parasites, ophthalmology, dermatology, reproduction, geriatrics, and alternative therapies.
- 3400 Horsemanship-Equitation.** Three credits. Prerequisite: ABAS 2400 or approval of instructor. Proper horseback riding, handling, mounting, and dismounting. Various gaits and proper equitation stressed. One lecture and two two-hour laboratory periods.
- 3410 Development of Horse Breeds.** Three credits. A review of the horse from the prehistoric era to present day with a focus on the development and contributions of horse breeds in the U.S. and state horse industry. Roles of breed associations, principles of genetics, selection of desired traits, genetic abnormalities associated with specific breeds, and matching breeds to disciplines discussed.
- 3420 Genetics of Domestic Livestock.** Three credits. Prerequisites: ABAS 1410; BIOL 1110, 1120; junior-level classification or higher. Basic principles of genetics, crossbreeding, inbreeding, and molecular genetics. Animal breeding topics include use of quantitative traits, prediction of breeding value, methods of selection, and genetic evaluations. Offered fall only.
- 3430 Horse Production.** Three credits. Prerequisite: ABAS 2110 or approval of instructor. Scientific principles relevant to production requirements of horses as related to exercise physiology and performance, growth, reproductive physiology and state, age, and clinical support. Facilities management, marketing, legal aspects of horse ownership, and career opportunities covered.
- 3440 Livestock Management.** Three credits. Prerequisite: ABAS 1410. Management practices for farm animal species. Practices include animal handling, restraint techniques, feeding, milking, castrations, identification methods, and herd health problems.
- 3450 Anatomy and Physiology of Domestic Animals.** Three credits. Prerequisites: BIOL 1110, 1120; ABAS 1410. The parts, functions, and anatomical relationships of various organs and systems of domestic animals.
- 3460 Farrier Science.** Three credits. Basic techniques in the science and art of making, fitting, and actual shoeing of horses accord-

ing to proper methods. One lecture and two two-hour laboratory periods. (Offered at irregular times in conjunction with the Division of Continuing Studies.)

- 3470 Beef Cattle Production.** Three credits. Prerequisites: ABAS 1410; junior-level classification or higher. Management practices essential for economic beef production including breeding, feeding, and herd health. Purebred, commercial, stocker, feedlot, and processing segments evaluated. Two lectures and one laboratory. Offered fall only.
- 3480 Swine Production.** Three credits. Prerequisites: ABAS 1410; junior-level classification or higher. Understanding management of the pig's environment and genetics to maximize profits. Includes nutrition, reproduction, genetics, housing, herd health, and management practices. Two lectures and one laboratory. Offered spring only.
- 3490 Poultry Production and Marketing.** Three credits. (Also listed under Agribusiness.) Prerequisites: ABAS 1410; junior-level classification or higher. A comprehensive study of commercial chicken production. Topics include the structure of the U.S. commercial chicken industries; poultry housing and equipment; broiler, broiler breeder, hatchery, and commercial layer management; and poultry/egg processing. Field trips used to supplement course materials. Two lectures and one laboratory. Offered spring only.
- 3500 Sheep Production.** Three credits. Genetics, nutrition, reproduction, and management practices essential for profitable sheep production.
- 3540 Dairy Production.** Three credits. Prerequisite: ABAS 1410; juniors and seniors only. Feeding and management, ruminant digestion, physiology of milk secretion, production testing and official records, sanitary regulations, handling and marketing of raw milk.
- 3810 Milk Processing and Marketing.** Three credits. (Also listed under Agribusiness.) Prerequisite: PSCI 1030 or CHEM 1010, 1011, 1020, 1021. Biological, chemical, and physical properties of cow's milk and its value as an animal food source; techniques of processing and marketing; governmental regulations; laboratory testing.
- 3900 Horses and Horsemanship.** Three credits. Basic requirements of horse ownership, care and associated expenses, inherent risks and safety around horses, and resources available in the horse industry. For non-horse-science majors.
- 4090 Equine Reproduction and Breeding.** Three credits. Prerequisites: ABAS 2110 and 3040 or 3430 or approval of instructor. Reproductive anatomy and physiology of the stallion and mare as they relate to modern breeding practices. Vocational training in semen handling, artificial insemination, and neonatal care. Two hours lecture and two hours laboratory.
- 4170 Equine Industry.** Three credits. Prerequisites: ABAS 2130 or 3130 and 3040 or approval of instructor. Operational strategies and management issues facing the equine enterprises. Financial, legal, and taxation issues pertaining to the U.S. and international equine industry.
- 4260 Behavior of Domestic Animals.** Three credits. Behavior aspects of raising and managing domestic animals to include equine, swine, goats, cattle, sheep, dogs, and cats. Communication, ingestive, sexual, social, aggressive, and abnormal behaviors emphasized.
- 4400 Advanced Horsemanship-Equitation.** Three credits. Prerequisites: ABAS 2400 and 3400 or approval of instructor. Advanced techniques of horseback riding at all position seats stressing proper equitation and coordination and refinement of techniques learned in previous courses.
- 4410 Animal Nutrition and Feeding.** Three credits. Prerequisites: ABAS 1410; CHEM 1020 or 1120; junior-level classification or higher. Advanced study of the processes of digestion and nutrient utilization in domestic animal species. Topics include monogastric and ruminant digestive anatomy and physiology; carbohydrate, lipid, protein, vitamin, and mineral utilization; feedstuff identification; practical computer-assisted feed formulation; and feeding management for agricultural animal species. Two lectures and one laboratory. Offered fall only.
- 4430 Internship in Animal Science.** Six credits. Prerequisite: Approval of instructor. In-depth practical experience in a specific area of animal science pertinent to the individual's interest. Students work with producers and agencies that have agreed to cooperate in the program and to provide adequate salary and guidance. NOT OPEN TO STUDENTS WHO HAVE RECEIVED CREDIT FROM ANOTHER SCHOOL INTERNSHIP COURSE.
- 4440 Equine Nutrition and Feeding.** Three credits. ABAS 1410 and CHEM 1010 and 1020 or approval of instructor. Equine digestion and utilization of nutrients, appropriate feeds and feeding management, and diseases with a nutritional component. Nutrient requirements for the horse at various stages, including maintenance, reproduction, growth, performance, age, and clinical support discussed.
- 4450 Techniques of Teaching Horsemanship.** Three credits. Prerequisites: ABAS 2400, 3400, and 4400 or approval of instructor. Basic techniques and methods used in teaching riding discussed and applied. Two-hour lecture and one two-hour laboratory.
- 4460 Behavior and Training of Horses.** Four credits. Prerequisites: ABAS 2400, 3400, 4400, or approval of instructor. The psychology, theory, and practice of training and behavior modification in horses. Students assigned a project horse for the semester. Two hours lecture and four hours laboratory.
- 4470 Advanced Beef Production.** Three credits. Prerequisite: ABAS 3470 or approval of instructor. In-depth analysis of various systems of beef production. Extensive field trips to cow-calf, feedlot, stocker, and purebred operations. Offered spring only.
- 4480 Selecting and Judging Horses.** Three credits. Individual parts, conformation, and gaits of the horse as they relate to selecting and judging horses for production, recreation, and sport.
- 4490 Livestock Evaluation.** Three credits. Prerequisite: Approval of instructor. Comparative evaluation of beef cattle, swine, sheep, and horses. Develops defense of placing through an organized set of reasons involving terms describing the animal's characteristics. Importance of these characteristics to the animal function stressed.
- 4510 Domestic Animal Reproductive Physiology.** Three credits. Prerequisites: ABAS 1410; BIOL 1110, 1120; junior-level classification or higher. Advanced study of the anatomy, physiology, and endocrinology of reproduction in domestic animal species. Topics include male and female reproductive anatomy, hormonal control of reproductive processes, reproductive development, the estrus cycle, male physiology, and lactation. Current techniques to control animal reproduction described. Two lectures and one laboratory. Offered spring only.

- 4520 Companion Animals.** Three credits. A comprehensive study of dog and cat management. Topics include canine and feline history; selective breeding; functional anatomy; reproductive physiology and management; nutrition and feeding management; diseases and health management; behavior, communication, and training. Service role of the dog and cat highlighted. Offered fall only.
- 4540 Therapeutic Riding and Hippotherapy.** Three credits. Prerequisites: ABAS 2110 and 2400 or approval of instructor. Selection, training, and use of horses in therapeutic horse programs. Management of a therapeutic program also emphasized. Two one-hour lectures concurrent with two one-hour laboratories offered each week.
- 4580 Advanced Judging of Horses.** Three credits. Prerequisite: ABAS 4480. Systems of judging for current horse show disciplines and exercises for students who aspire to become professional judges. Ethics, contracts with management, and procedures for becoming a judge are part of focus.
- 4590 Dairy Cattle Judging.** Three credits. Ideal dairy cattle type and relationship to performance and longevity. Classification and evaluation according to type of the various breeds and comparative judging within the breed. Selection for genetic improvement.
- 4860 Meat Science and Technology.** Three credits. Prerequisites: ABAS 1410 and sophomore-level classification or higher. Selecting, inspecting, grading, fabricating, packaging, preserving, and cooking red meat products. Other topics include anatomy, structure, and composition of muscle, food safety, and microbiology. Offered spring only.
- 4980 Seminar in Horse Science.** Three credits. Familiarizes horse science majors with important current scientific investigation.

Plant and Soil Science

- 1610 Elements of Plant Science.** Three credits. Fundamental plant processes; plant tissues, structures, environment, growth, development, reproduction, and propagation.
- 3330 Field Crop Production.** Three credits. Economic importance, adaptation, origin, and history; botanical characteristics; cultural methods, uses, breeding, and pests of field crops.
- 3340 Soil.** Three credits. Physical, chemical, and biological properties. REQUIRED FOR ENVIRONMENTAL SCIENCE MAJORS.
- 3350 Soil Fertility and Fertilizer.** Three credits. Prerequisite: ABAS 3340. Use of fertilizer and liming materials in soil-plant relationships. Lecture/lab.
- 3360 Irrigation and Drainage.** Three credits. Prerequisite: ABAS 3340. Comparative evaluation and interpretation of irrigation and drainage systems; water supply development; interrelationships of the environment and plants; scheduling irrigation; examination of economic and legal factors. Lecture/lab.
- 3370 Soil Analysis.** Three credits. Prerequisite: ABAS 3340. Analysis of soils in laboratory. REQUIRED FOR ENVIRONMENTAL SCIENCE MAJORS. Lecture/lab.
- 3630 Forestry.** Three credits. Culture, conservation, management, and utilization of forest stands.
- 3640 Woody Landscape Plants.** Three credits. Distribution, characteristics, relationships, and adaptation of native and exotic trees, shrubs, and vines for landscape use. One-hour lecture and four-hour lab.
- 3660 Vegetable Gardening.** Three credits. Principles of home and commercial vegetable production; adaptation, culture, fertility, diseases, and insects of vegetables.
- 3700 Agricultural Chemicals in Soil Environments.** Three credits. Prerequisites: BIOL 1110, 1120, and CHEM 1010, 1011, 1020, 1021 or approval of instructor. Characteristics, use, mode of action, degradation, and environmental impact of fertilizers and pesticides used in agriculture; environmental safeguards imposed by federal and state regulations on chemical use.
- 4200 Fruit and Vegetable Marketing.** Three credits. (Also listed under Agribusiness.) Prerequisites: PSCI 1030 and BIOL 1030 or approval of instructor. Basic biochemistry of respiration, handling techniques and practices, quality assessment and marketing of fruit and vegetable crops. Both domestic and international marketing of fruit and vegetable products discussed. Examines the economic impact of improper handling on both the local producer and the end user.
- 4300 Plant Protection.** Three credits. Prerequisite: ABAS 1610 or 4 hours of biology. Principles of protecting crop plants from damage by weeds, insects, diseases, and other biotic factors. Pest control by chemical, cultural, and biological methods with an emphasis on integrated pest management.
- 4310 Forage Crops.** Three credits. Adaptation, distribution, establishment, management, culture, and utilization of forage legumes and grasses.
- 4330 Turf Management.** Three credits. Prerequisite: ABAS 1610 or BIOL 1120. Establishment and management of turf grasses for lawns, golf courses, and parks.
- 4340 Soil Formation and Remediation.** Three credits. Prerequisite: ABAS 3340. The relation of climate, plant and animal life, geological formations, and land forms to soil genesis and remediation. Lecture/lab.
- 4350 Soil Survey and Land Use.** Three credits. Prerequisite: ABAS 3340 or approval of instructor. Soil properties used to determine suitability for land use. Lecture/lab.
- 4370 Soil and Water Conservation.** Three credits. Principles and practices of soil and water conservation in rural and urban environments. Lecture/lab.
- 4380 Interior Landscaping.** Three credits. Principles and practices of designing, installing, and maintaining landscapes in malls, public buildings, and other indoor environments.
- 4390 Urban and Sports Turf Soils.** Three credits. Prerequisites: ABAS 3340 and 4330. Describe, design, manage, and evaluate urban and sports turf soils. Lecture/lab.
- 4610 Arboriculture.** Three credits. Prerequisite: ABAS 1610 or BIOL 1120. The culture of trees, shrubs, and vines in the landscape. Planting, transplanting, fertilizing, irrigation, pruning, problem diagnosis, and damage repair included.
- 4620 Greenhouse Management.** Three credits. Prerequisite: ABAS 1610 or BIOL 1120. Analysis of soils, fertilizers, irrigation tech-

niques, container preparation, ventilation, growth regulation, and carbon dioxide enrichment for greenhouse operation. Two-hour lecture and two-hour lab.

- 4630 Floriculture.** Three credits. Prerequisite: ABAS 1610 or BIOL 1120. Propagation and other cultural practices for the production and maintenance of plants and flowers in the home. Two-hour lecture and two-hour lab.
- 4640 Landscaping.** Three credits. Application of the principles of design, the use of proportionate-sized woody landscape plants, and other practices to produce low-maintenance-cost landscapes. One-hour lecture and four-hour lab.
- 4660 Nursery Management.** Three credits. Prerequisite: ABAS 1610 or BIOL 1120. Principles and practices of nursery management as a business. Nursery administration, financial management, and marketing. Cultural management of field- and container-grown nursery plants.
- 4670 Plant Propagation.** Three credits. Prerequisite: ABAS 1610 or BIOL 1120. Anatomical features and physiological principles involved in propagating plants from seed and by division, cutting, budding, and grafting. Use of growth regulators and environmental factors. Two-hour lecture and two-hour lab.
- 4680 Internship in Plant and Soil Science.** Six credits. Prerequisite: Approval of instructor. Practical experience in a specific area of agronomy, horticulture, or soils. Classroom material related to practical application. NOT OPEN TO STUDENTS WHO HAVE RECEIVED CREDIT FROM ANOTHER SCHOOL INTERNSHIP.
- 4690 Japanese Landscaping.** Three credits. The elements of Japanese garden design.

Agricultural Education

- 2230 Introduction to Vocational Agricultural Education.** Three credits. Duties of the vocational agriculture teacher with special emphasis on the Future Farmers of America and Supervised Agricultural Experience Programs.
- 4210 Farm Power and Equipment.** Three credits. Gasoline engines with actual work experience in overhaul. Work also with transmissions, hydraulics, braking systems, and other farm equipment including use of shop manuals, operation manuals, and parts books.
- 4220 Methods of Teaching Agriscience and Agriculture Mechanics.** Three credits. Integrating science into agriculture emphasizing biology, chemistry, and physics. Emphasis on mechanical skills such as small gas engines, gas welding, and electricity.
- 4230 Adult Education in Vocational-Technical Education and Program Development.** Three credits. How to teach adults and administer adult programs. Emphasis on planning, organizing, and arranging courses for adults in agriculture.
- 4240 Workshops in Agricultural Education.** One to six credits each. Prerequisite: Teaching experience or approval of instructor. Designed to provide vocational agriculture teachers with intensive training in selected areas of agriculture. A MAXIMUM OF SIX CREDIT HOURS IN EACH DIVISION.
- 4241 Production Agriculture**
4242 Ornamental Horticulture
4243 Agricultural Mechanics
4244 Farm Energy Alternatives
4245 Problems of New and Established Teachers

Agribusiness and Agriscience General

- 1000 Orientation in Agriculture.** One credit. Job opportunities in agriculture, departmental facilities, extracurricular activities at MTSU associated with specific phases of agriculture. Pass/Fail.
- 2210 Introduction to Agricultural Engineering.** Three credits. Prerequisite: MATH 1710 or 1010 or approval of instructor. Basic principles, mechanics, combustion engines, electricity, building construction, and machinery with applications of problem solving techniques.
- 3010 Agri-Media Skills.** Three credits. Applications of oral and written skills in communicating about agricultural research, shows, and sales.
- 3600 Horticulture in Our Lives.** Three credits. Emphasis on the role of horticulture in everyday living, through principles of growing plants in the home, floral design, home landscaping, and gardening.
- 4100 Microcomputer Applications in Agriculture.** Three credits. Includes use of agricultural software, agricultural communications networks, computer dairy feeding systems, and farm records.
- 4250 Leadership in Agricultural Industries.** Three credits. Prerequisite: Junior or senior standing or consent of instructor. A capstone course to enhance students' leadership and human relation skills in the workplace. Topics include leadership styles, theories, characteristics of leaders (conceptual, technical, human relations), communication styles, group dynamics, conducting successful meetings, problem solving, goal setting, attitudes, motivation, self-concept, learning styles, time management, and employability skills.
- 4700 Agriculture in Our Lives.** Three credits. National and international importance of U.S. agriculture. Emphasis on food production and marketing, land conservation, and agriculture-related recreation. Accepted as a natural science elective for education majors. NO CREDIT GIVEN TOWARD A MAJOR IN THE SCHOOL OF AGRIBUSINESS AND AGRISCIENCE.
- 4910 Problems in Agriculture.** One to six credits. Problem or problems selected from one of the major disciplines. May involve conferences with instructor, library work, field study and/or laboratory activity. Students can take from one to three credits with a maximum of three per semester.
- 4990 Seminar.** One credit. Students required to research and give an oral report on a current agricultural topic.

Graduate Study

A graduate minor is offered in Agriculture. Requirements and a list of the courses offered for graduate credit are published in the Graduate Catalog.