

# School of Agribusiness and Agriscience

**Harley Foutch, Director**  
**Stark Agribusiness and Agriscience Center 100**

**Anderson, Brzezicki, Downs, Halterlein, Johnston, Mehlhorn, Redd,  
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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

- 21 hours in the major area;
- an additional six (6) hours from ABAS as indicated under each major's requirements; and
- a general core of ABAS 1000, 1410, 1610, 2210, 3010, and 4100. (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, Physics and Astronomy, and Engineering Technology and Industrial Studies. A complete description of this program is found under the Department of Engineering Technology and Industrial Studies.

**In all curricular listings, (Area \_\_ ) refers to the General Studies requirements as outlined on pages 59-61.**

## 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

| <b>FRESHMAN</b>              |           | <b>SOPHOMORE</b>         |           |
|------------------------------|-----------|--------------------------|-----------|
| ABAS 1000, 1410, 1610        | 7         | ABAS 2130, 2210          | 6         |
| English (Area I-A)           | 6         | English (Area II-A)      | 6         |
| BIOL 1030 (Area IV-A)        | 4         | COMM 2200 (Area I-B)     | 3         |
| Mathematics (Area IV-B)      | 3         | PSCI 1030 (Area IV-A)    | 4         |
| Gen. Studies (Area II-B)     | 3         | History (Area III-A)     | 6         |
| Electives                    | 6         | ECON 2410 (Area III-B)   | 3         |
| PHED (Area V)                | 2         | Elective                 | 3         |
|                              | <b>31</b> | PHED (Area V)            | 2         |
|                              |           |                          | <b>33</b> |
| <b>JUNIOR</b>                |           | <b>SENIOR</b>            |           |
| ABAS 3130, 3010              | 6         | ABAS 4100, 4190          | 6         |
| CSCI 1150 or INFS 2200       | 3         | Minor requirements       | 9         |
| Animal Science elective      | 3         | Agribusiness electives*  | 6         |
| Minor requirements           | 9         | Upper-division electives | 14        |
| Agribusiness electives*      | 6         |                          | <b>35</b> |
| Upper-division elective      | 3         |                          |           |
| Plant and Soil Science elec. | 3         |                          |           |
|                              | <b>33</b> |                          |           |

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

## 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

| <b>FRESHMAN</b>                            |           | <b>SOPHOMORE</b>                           |           |
|--|-----------|--|-----------|
| ABAS 1000, 1410, 1610                      | 7         | ABAS 2210                                  | 3         |
| English (Area I-A)                         | 6         | COMM 2200 (Area I-B)                       | 3         |
| BIOL 1110, 1120 (Area IV-A)                | 8         | English (Area II-A)                        | 6         |
| Gen. Studies (Area II-B)                   | 3         | CHEM 1010, 1011,<br>1020, 1021 (Area IV-A) | 8         |
| Mathematics (Area IV-B)                    | 3         | History (Area III-A)                       | 6         |
| PHED (Area V)                              | 2         | Gen. Studies (Area III-B)                  | 3         |
| Agribusiness or Animal<br>Science elective | 3         | PHED (Area V)                              | 2         |
|  | <b>32</b> |  | <b>31</b> |
| <b>JUNIOR</b>                              |           | <b>SENIOR</b>                              |           |
| ABAS 3130, 3340 or 4310                    | 6         | ABAS 4100, 4410, 4510                      | 9         |
| ABAS 3420, 3440                            | 6         | Animal Science electives*                  | 6         |
| CSCI 1150 or INFS 2200                     | 3         | Minor requirements                         | 9         |
| Minor requirements                         | 9         | Upper-division electives                   | 7         |
| Upper-division electives                   | 11        | ABAS 3010                                  | 3         |
|  | <b>35</b> |  | <b>34</b> |

*\*Electives must come from the following courses: ABAS 3430, 3470, 3480, 3490, 3500, 3540, 4090, 4470, 4520*

**Concentration: Horse Science**

Advisor: Jerry W. Williams

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

| <b>FRESHMAN</b>             |           | <b>SOPHOMORE</b>                           |           |
|-----------------------------|-----------|--|-----------|
| ABAS 1000, 1410, 1610       | 7         | ABAS 3410                                  | 3         |
| ABAS 2400                   | 3         | COMM 2200 (Area I-B)                       | 3         |
| Gen. Studies (Area II-B)    | 3         | English (Area II-A)                        | 6         |
| English (Area I-A)          | 6         | CHEM 1010, 1011,<br>1020, 1021 (Area IV-A) | 8         |
| BIOL 1110, 1120 (Area IV-A) | 8         | History (Area III-A)                       | 6         |
| Mathematics (Area IV-B)     | 3         | Gen. Studies (Area III-B)                  | 3         |
| PHED (Area V)               | 2         | Upper-division elective*                   | 3         |
|                             | <b>32</b> | PHED (Area V)                              | 2         |
|                             |           |  | <b>34</b> |
| <b>JUNIOR</b>               |           | <b>SENIOR</b>                              |           |
| ABAS 2210, 3040, 3130       | 9         | ABAS 3010, 4090, 4100                      | 9         |
| ABAS 3340, 3440             | 6         | ABAS 4460                                  | 3         |
| CSCI 1150 or INFS 2200      | 3         | Minor requirements                         | 6         |
| Minor requirements          | 12        | Agribusiness elective                      | 3         |
| Upper-division elective**   | 3         | Upper-division electives                   | 12        |
|                             | <b>33</b> |  | <b>33</b> |

\*ABAS 3400 recommended

\*\*ABAS 4400 recommended

**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

| <b>FRESHMAN</b>                      |           | <b>SOPHOMORE</b>                           |           |
|--------------------------------------|-----------|--|-----------|
| ABAS 1000, 1410, 1610                | 7         | ABAS 2210                                  | 3         |
| English (Area I-A)                   | 6         | English (Area II-A)                        | 6         |
| BIOL 1110, 1120 (Area IV-A)          | 8         | CHEM 1010, 1011,<br>1020, 1021 (Area IV-A) | 8         |
| Mathematics (Area IV-B)              | 3         | History (Area III-A)                       | 6         |
| Gen. Studies (Area II-B)             | 3         | Gen. Studies (Area III-B)                  | 3         |
| Agribusiness elective                | 3         | COMM 2200 (Area I-B)                       | 3         |
| PHED or M S (Area V)                 | 2         | PHED (Area V)                              | 2         |
|                                      | <b>32</b> |  | <b>31</b> |
| <b>JUNIOR</b>                        |           | <b>SENIOR</b>                              |           |
| ABAS 3130, 3340                      | 6         | ABAS 3010, 4100                            | 6         |
| Plant and Soil<br>Science electives* | 6         | Plant and Soil<br>Science electives*       | 12        |
| CSCI 1150 or INFS 2200               | 3         | Minor requirements                         | 9         |
| Minor requirements                   | 9         | Upper-division electives                   | 6         |
| Upper-division electives             | 12        |  | <b>33</b> |
|                                      | <b>36</b> |  |           |

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

**Concentration: Agricultural Communication**

Advisor: Tony Johnston

This concentration is available under all three departmental majors. A minor in Mass Communication is required. The program is designed to meet the needs of students who are interested in specializing in the communications phase of agriculture. Freshman and sophomore requirements are listed with each major.

| <b>JUNIOR</b>            |           | <b>SENIOR</b>            |           |
|--------------------------|-----------|--------------------------|-----------|
| Gen. Studies (Area II-B) | 3         | P R 3040; JOUR/RATV 4250 | 6         |
| ABAS 3130, 3340          | 6         | Mass Comm minor          | 12        |
| ABAS 3010                | 3         | Animal Science electives | 3         |
| Mass Comm minor          | 6         | ABAS 4100                | 3         |
| ABAS electives           | 15        | Upper-division electives | 8         |
|                          | <b>33</b> |                          | <b>32</b> |

**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.

**Certification in Agricultural Education**

Advisor: Cliff Ricketts

Students seeking certification to teach agricultural education in secondary schools (grades 7-12) must complete (1) one of the three school majors, (2) a minor in professional education, (3) professional agricultural education courses, and (4) courses in addition to the general education program. Specific course requirements are

| <b>FRESHMAN</b>                |           | <b>SOPHOMORE</b>                              |           |
|--------------------------------|-----------|---|-----------|
| ABAS 1000, 1410,<br>1610, 2130 | 10        | ABAS 2230, 3440                               | 6         |
| English (Area I-A)             | 6         | English (Area II-A)                           | 6         |
| BIOL 1110, 1120 (Area IV-A)*   | 8         | FOED 2110                                     | 3         |
| Mathematics (Area IV-B)        | 3         | CHEM 1010, 1011,<br>1020, 1021 (Area IV-A)*** | 3         |
| Gen. Studies (Area II-B)       | 3         | History (Area III-A)                          | 3         |
| Gen. Studies (Area III-B)**    | 3         | FOED 1110                                     | 3         |
| PHED (Area V)                  | 2         | PHED (Area V)                                 | 2         |
|                                | <b>35</b> |   | <b>34</b> |
| <b>JUNIOR</b>                  |           | <b>SENIOR</b>                                 |           |
| ABAS 3130, 3340                | 6         | ABAS 4100, 4210, 4250                         | 9         |
| CSCI 1150 or INFS 2200         | 3         | Major requirements                            | 6         |
| ABAS 3600, 4220, 4230          | 9         | SPSE 3220                                     | 3         |
| ABAS 2210                      | 3         | YOED 4000                                     | 3         |
| SPED 3010                      | 3         | YOED 4110                                     | 12        |
| YOED 3050                      | 3         | COMM 2200 (Area I-B)                          | 3         |
| Major requirements             | 9         |   | <b>36</b> |
|                                | <b>36</b> |   |           |

\*Agribusiness majors may take BIOL 1030.

\*\* Agribusiness majors must take ECON 2410.

\*\*\*Agribusiness majors may take PSCI 1030.

For certification to teach agriscience, the following additional courses should be taken: BIOL 4240 (4 hrs. credit), PHYS 2010 (1 hr.), 2011 (3 hrs.), 2020 (3 hrs.), 2021 (1 hr.).

## Pre-Agricultural Engineering

Advisor: Tony Johnston

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 (Area I-A)             | 6         | MATH 3110, 3120 | 7         |
| CHEM 1110, 1111,<br>1120, 1121 | 8         | PHYS 2110, 2111 | 4         |
| MATH 1910, 1920                | 8         | ET 3830, 3840   | 6         |
| ET 2310, 3360                  | 8         | ET 3860, 4970   | 6         |
| ET 1840                        | 3         | ABAS 1610, 3340 | 6         |
|                                |           | COMM 2200       | 3         |
|                                | <b>33</b> |                 | <b>32</b> |

### 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

Advisor: Warren Anderson

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 (Area IV-A) | 8         | CHEM 1010, 1011,<br>1020, 1021 (Area IV-A) | 8         |
| English (Area I-A)          | 6         | GEOL 1040                                  | 4         |
| ABAS 1610                   | 3         | ECON 2410, 2420                            | 6         |
| ABAS 3630                   | 3         | English (Area II-A)                        | 6         |
| MATH 1710, 1720*            | 6         | MATH 1530**                                | 3         |
| PHYS 1300                   | 3         | ABAS 3340                                  | 3         |
| COMM 2200 (Area I-B)        | 3         | CSCI 1150                                  | 3         |
|                             | <b>32</b> |  | <b>33</b> |

\*Students may substitute MATH 1730 and 1910 for 1710 and 1720.

\*\*Students may substitute STAT 3150 for MATH 1530.

## Pre-Veterinary Medicine

Advisor: Kevin Downs

Students completing this program frequently pursue studies at the College of Veterinary Medicine, University of Tennessee, Knoxville, where they may earn a Doctor of Veterinary Medicine (D.V.M.); graduate studies leading to a Master of Science (M.S.) or Doctor of Philosophy (Ph.D.) are also available at the University of Tennessee. Students who are continuing their studies in veterinary medicine at other universities should follow the appropriate catalogs in fulfilling their requirements.

A minimum of 72 semester hours of college work must be completed before admission to the professional curriculum of the College of Veterinary Medicine at the University of Tennessee. The following curriculum will enable a student to continue in a standard veterinary curriculum to complete work for a degree in veterinary medicine:

|                                   |              |
|-----------------------------------|--------------|
| English composition               | 6            |
| CHEM 1110, 1111,<br>1120, 1121    | 8            |
| BIOL 1110, 1120                   | 8            |
| Humanities and Social<br>Science* | 18           |
| PHYS 2010, 2011,<br>2020, 2021    | 8            |
| CHEM 3010, 3020                   | 8            |
| BIOL 2120, 4210**                 | 8            |
| CHEM 3530                         | 4            |
| Math***                           | 0-6          |
|                                   | <b>68-74</b> |

\*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. Students may also earn an MTSU B.S. degree under the program outlined on page 56 (Bachelor of Science requirements, No. 4) whereby a student who completes six semesters at MTSU is admitted to and successfully completes one year in a professional program.

## Courses in Agribusiness and Agriscience [ABAS]

### Agribusiness

**2130 (213) Introduction to Agribusiness.** Three credits. Nature, scope, importance, and relationship to the general economy.

**3130 (313) Principles of Agricultural Economics.** Three credits. Applying the principles of economics to agricultural problems.

**3490 (349) Poultry Production and Marketing.** Three credits. (Also listed under Animal Science.) Prerequisite: PSCI 1030 or CHEM 1010, 1011, 1020, 1021. The practices, techniques, and demands of further processed poultry production in the U.S., including chickens, ostriches, and emus and egg production. Both domestic and international marketing of poultry products discussed. Examines the economic impact of the poultry industry on both local and national economies.

**3810 (381) 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; techniques of processing and marketing; governmental regulations; dairy arithmetic and laboratory testing.

- 4130 (413) 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 (414) Economics of Agribusiness Management.** Three credits. Prerequisite: ABAS 3130 or approval of instructor. Application of economic concepts to agribusiness firms.
- 4150 (415) 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 (416) Agricultural Cooperatives.** Three credits. Prerequisite: ABAS 3130. Role of agricultural cooperatives in collective bargaining for farmers; historical development, economic organization, and structural aspects.
- 4180 (418) 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 (419) International Agriculture.** Three credits. Prerequisite: ABAS 3130. The effect of international trade on the U.S. agricultural industry.
- 4200 (420) 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 (481) 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 (482) 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 (483) 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 (141) Elements of Animal Science.** Three credits. Types and breeds of beef cattle, dairy cattle, sheep, horses, swine, and poultry. Special emphasis on breeds adapted to Tennessee and to market classifications.
- 2110 (211) Basic Horsemanship-Equitation.** One credit. (Same as PHED 2110, activity for men and women.) Preparation for recreational horseback riding; proper riding skills, handling, mounting, dismounting. Various gaits and proper equitation stressed. Two one-hour laboratories.
- 2400 (240) 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 (304) 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.
- 3400 (340) 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 (341) Light Horse Breeds.** Three credits. Historical development of the horse and the establishment of the individual light horse breeds.
- 3420 (342) Genetics of Domestic Livestock.** Three credits. Includes an introduction to the basic principles of genetics, inbreeding, quantitative traits in livestock, prediction of breeding value and genetic progress, method of selection, mating systems, methods of genetic evaluation, computer software for animal breeding and genetics, and genetic engineering.
- 3430 (343) Light Horse Production.** Three credits. Prerequisite: ABAS 2400 or approval of instructor. Breeding, feeding, management, and disease control practices essential for economical light horse production.
- 3440 (344) Livestock Management.** Three credits. Prerequisite: Junior or senior standing. Practical solutions to management problems including feeding and fitting of beef and dairy cattle and swine, sheep shearing, branding of cattle, castrations, and other routine practices. Designed to accompany production courses of light horses, beef cattle, swine, dairy cattle. One lecture and two two-hour laboratory periods.
- 3450 (345) Anatomy and Physiology of Domestic Animals.** Three credits. The parts, functions, and anatomical relationships of various organs and systems of domestic animals.
- 3460 (346) Farrier Science.** Three credits. Basic techniques in the science and art of making, fitting, and actual shoeing of horses according to proper methods. One lecture and two two-hour laboratory periods. (Offered at irregular times in conjunction with the Division of Continuing Studies.)
- 3470 (347) Beef Cattle Production.** Three credits. Breeding, feeding, and management practices essential for economical beef production. Purebred, commercial, and feedlot programs and

their role in the beef industry. Beef evaluation through carcass and testing programs.

- 3480 (348) Swine Production.** Three credits. Breeding, feeding, management, and disease control practices essential for economical swine production. Types of buildings, waste disposal, and development of the pig through the nursing, growing, and finishing stages.
- 3490 (349) Poultry Production and Marketing.** Three credits. (Also listed under Agribusiness.) Prerequisite: PSCI 1030 or CHEM 1010, 1011, 1020, 1021. The practices, techniques, and demands of further processed poultry production in the U.S., including chickens, ostriches, and emus and egg production. Both domestic and international marketing of poultry products discussed. Examines the economic impact of the poultry industry on both local and national economies.
- 3500 (350) Sheep Production.** Three credits. Genetics, nutrition, reproduction, and management practices essential for profitable sheep production.
- 3540 (354) Dairy Production.** Three credits. Feeding and management, ruminant digestion, physiology of milk secretion, production testing and official records, sanitary regulations, handling and marketing of raw milk.
- 3810 (381) 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 (390) Horses and Horsemanship.** Three credits. Applications of basic requirements in owning, caring for, and using the pleasure horse as a personal riding mount.
- 4090 (409) Horse Breeding Farm Management.** Three credits. Prerequisites: ABAS 2400, 3040, and 3430 or approval of instructor. Practical, as well as vocational, application of the principles of horse breeding farm management stressed.
- 4260 (426) 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 (440) 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 (441) Animal Nutrition and Feeding.** Three credits. Gastrointestinal tract, process of digestion, and nutrient utilization. Application of principles of animal nutrition to formulation of supplements and complete rations for livestock.
- 4420 (442) Advanced Livestock Management.** Three credits. Prerequisite: ABAS 3440 or approval of instructor. The opportunity to become proficient in managerial practices vital to efficient, economical livestock production. Unique in that students gain needed experiences, enabling them to proceed to livestock managerial positions. One-hour lecture and two two-hour laboratories.
- 4430 (443) 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.
- 4450 (445) 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-hours lecture and one two-hour laboratory.
- 4460 (446) Care and Training of Horses.** Three credits. Prerequisites: ABAS 2400, 3400, and 4400 or approval of instructor. Theory, fundamentals, and practices of breaking, training, fitting, showing, and using light horses for riding and driving, with special emphasis on the Tennessee Walking Horse and the needs of the local area.
- 4470 (447) Advanced Beef Production.** Three credits. Prerequisite: ABAS 3470 or approval of instructor. In-depth look at various systems of beef production from standpoint of function, economics, and suitability to locale. Extensive field trips to commercial cow-calf, feedlot, performance testing, stocker, and purebred operations.
- 4480 (448) 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 (449) Livestock Evaluation.** Three credits. 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 (451) Domestic Animal Reproductive Physiology.** Three credits. Advanced topics in the anatomy, physiology, and endocrinology of reproduction in domestic livestock species. Topics include male and female physiology and an overview of comparative anatomy and physiology between species. Current technologies and methods in controlling reproduction in livestock species also discussed.
- 4520 (452) Companion Animals.** Three credits. Introduces the variety of companion animals (dogs, cats, horses, rabbits, ferrets, amphibians, fish, hamsters, gerbils, and birds) and further examines issues related to dogs and cats. Breeds, behavior, breeding, training, and care and management of dogs and cats emphasized.
- 4580 (458) 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 (459) 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 (486) Meat Science and Technology.** Three credits. Prerequisite: Approval of instructor. Ideal livestock type and relationship

to carcass merit, reproduction, and longevity. Characteristics of livestock carcasses, wholesale and retail cut locations and value, grading systems, and evaluation of overall carcass merit and that of component parts. The art of cutting cattle and hog carcasses into wholesale and retail cuts. One-hour lecture and one four-hour laboratory.

**4980 (498) Seminar in Horse Science.** Three credits. Familiarizes horse science majors with important current scientific investigation.

### Plant and Soil Science

**1610 (161) Elements of Plant Science.** Three credits. Fundamental plant processes; plant tissues, structures, environment, growth, development, reproduction, and propagation.

**3330 (333) Field Crop Production.** Three credits. Economic importance, adaptation, origin, and history; botanical characteristics; cultural methods, uses, breeding, and pests of field crops.

**3340 (334) Soil.** Three credits. Physical, chemical, and biological properties. REQUIRED FOR ENVIRONMENTAL SCIENCE MAJORS.

**3350 (335) Soil Fertility and Fertilizer.** Three credits. Prerequisite: ABAS 3340. Use of fertilizer and liming materials in soil-plant relationships. Lecture/lab.

**3370 (337) Soil Analysis.** Three credits. Prerequisite: ABAS 3340. Analysis of soils in laboratory. REQUIRED FOR ENVIRONMENTAL SCIENCE MAJORS. Lecture/lab.

**3630 (363) Forestry.** Three credits. Culture, conservation, management, and utilization of forest stands.

**3640 (364) 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 (366) Vegetable Gardening.** Three credits. Principles of home and commercial vegetable production; adaptation, culture, fertility, diseases, and insects of vegetables.

**3700 (370) 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 (420) 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 (430) 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 (431) Forage Crops.** Three credits. Adaptation, distribution, establishment, management, culture, and utilization of forage legumes and grasses.

**4330 (433) Turf Management.** Three credits. Prerequisite: ABAS 1610 or BIOL 1120. Establishment and management of turf grasses for lawns, golf courses, and parks.

**4340 (434) Soil Formation.** Three credits. Prerequisite: ABAS 3340. Environmental factors affecting soil formation and utilization.

**4350 (435) 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 (437) Soil and Water Conservation.** Three credits. Principles and practices of soil and water conservation in rural and urban environments. Lecture/lab.

**4380 (438) Interior Landscaping.** Three credits. Principles and practices of designing, installing, and maintaining landscapes in malls, public buildings, and other indoor environments.

**4390 (439) 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 (461) 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 (462) Greenhouse Management.** Three credits. Prerequisite: ABAS 1610 or BIOL 1120. Analysis of soils, fertilizers, irrigation techniques, container preparation, ventilation, growth regulation, and carbon dioxide enrichment for greenhouse operation. Two-hour lecture and two-hour lab.

**4630 (463) 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 (464) 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.

**4650 (465) Plant Breeding.** Three credits. Prerequisite: ABAS 1610 or BIOL 2120. Application of genetics to theory and breeding practices for improvement of agronomic and ornamental plants.

**4660 (466) 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 (467) 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 (468) 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 (469) Japanese Landscaping.** Three credits. The elements of Japanese garden design.

## Agricultural Education

- 2230 (223) 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 (421) 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 (422) Methods of Teaching Agricultural Mechanics.** Three credits. Emphasis on performing shop skills such as welding, brazing, wiring, etc.
- 4230 (423) 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 (424) 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 (424A) Production Agriculture**  
**4242 (424B) Ornamental Horticulture**  
**4243 (424C) Agricultural Mechanics**  
**4244 (424D) Farm Energy Alternatives**  
**4245 (424E) Problems of New and Established Teachers**

## Agribusiness and Agriscience General

- 1000 (100) Orientation in Agriculture.** One credit. Job opportunities in agriculture, departmental facilities, extracurricular activities at MTSU associated with specific phases of agriculture. Pass/Fail.
- 2210 (221) 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 (301) Agri-Media Skills.** Three credits. Applications of oral and written skills in communicating about agricultural research, shows, and sales.
- 3600 (360) 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. NO CREDIT GIVEN TOWARD A MAJOR IN THE SCHOOL OF AGRIBUSINESS AND AGRISCIENCE.
- 4100 (410) Microcomputer Applications in Agriculture.** Three credits. Prerequisite: CSCI 1150 or INFS 2200. Includes use of agricultural software, agricultural communications networks, computer dairy feeding systems, and farm records.
- 4250 (425) 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 (470) 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 (491) 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 (499) 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.

