

# DEPARTMENT OF AGRICULTURAL SCIENCES

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**Website:** Department of Agricultural Sciences (<http://www.shsu.edu/academics/agricultural-sciences-and-engineering-technology>)

The Department of Agricultural Sciences consists of 2 major programs of study:

- Agricultural Sciences
- Career and Technology Education

Within each program are a number of specialized programs or majors, offering students the opportunity to tailor degree programs with career goals. Specific requirements for each degree are outlined under the respective program headings. For more information, please visit the Department of Agricultural Sciences website (<http://www.shsu.edu/academics/agricultural-sciences-and-engineering-technology>), or contact Dr. Shyam Nair (shyam.nair@shsu.edu).

## Highlights

The Agricultural Sciences program has multiple educational centers and complexes

- The Fred L. Pirkle Engineering Technology Center has many specialized classrooms and laboratories that service the agriculture program: Agribusiness Team Based Learning, Animal Science Physiology, Wildlife Management, Floral Design, and Agricultural Communications.
- The Agriculture Center Complex has a greenhouse, horse barns, covered arena, and meat science laboratory.
- The Plant Science Field Lab has two greenhouses and laboratory facilities for plant science and plant propagation.
- The William R. Harrell Agricultural Engineering Technology Center provides students with hands-on experience in metal fabrication, electricity and electronics, hydraulics, structures, alternative energy resources, and soil and water conservation.
- The 1740-acre Gibbs Ranch Education and Research Facility, located north of campus on Highway 75, serves as a living laboratory for all aspects of agricultural and natural resource education.

## Career Opportunities

Approximately twenty percent of our population is involved in occupations directly related to agriculture. Sectors such as production, banking, marketing, teaching, processing, and service in governmental agencies rely on the productivity of modern agriculture in meeting the daily needs of society.

Additional career information is given in the introduction to each of the degree programs in agriculture.

## Suggested Minors

For those seeking secondary teacher certification in agricultural science, Secondary Education (CISE) is used for the minor. The most common major used for this purpose is Interdisciplinary Agriculture, but the CISE minor may be used with other program areas within the department as well. Many Agricultural Business, Animal Science, Agricultural Engineering Technology, and Plant & Soil Sciences majors will select minors from program areas within the department (see Minor area), while others will select from the College of Business Administration, such as Management, Marketing, Accounting, Banking, Finance, or General Business Administration. Animal Science majors can select a minor in Conservation Biology, Wildlife Management, or Equine Science. Biology or Composite Science is frequently taken as a minor by Animal Science and Plant & Soil Sciences students considering graduate school. Agricultural Engineering Technology majors often select areas available in the Engineering Technology Program or Secondary Education. Minors in Plant & Soil Sciences, Animal Science, Equine Science, Agricultural Engineering Technology, and Agribusiness are available for those majoring in other specific agricultural disciplines. For instance, an Agribusiness student may minor in Plant & Soil Sciences to better prepare for the business aspects in the field of horticulture.

## Program-Specific Requirements

The **objectives** of the Agricultural Sciences Program are to:

- Provide high quality instruction in agricultural sciences, technology, and business;
- Promote research in agricultural sciences;
- Provide a program of continuing education for teachers of agricultural science and agricultural producers; and
- Provide educational and competitive activities for youth interested in the agricultural sciences.

For additional information regarding admission requirements, degree programs, description of courses, and financial assistance available, please refer to the appropriate sections of this catalog. Brochures and information concerning the department and scholarships may be obtained by calling (936) 294-1215 or writing:

Sam Houston State University

Department of Agricultural Sciences  
Huntsville, Texas 77341-2088

or by e-mailing a request to shyam.nair@shsu.edu (sfkelley@shsu.edu.). Website: <http://www.shsu.edu/academics/agricultural-sciences/>

- Bachelor of Science, Major in Interdisciplinary Agriculture
- Bachelor of Science, Major in Agricultural Business
- Bachelor of Science, Major in Agricultural Communications
- Bachelor of Science, Major in Agricultural Engineering Technology
- Bachelor of Science, Major in Agricultural Engineering Technology with Teaching Certification
- Bachelor of Science, Major in Animal Science
- Bachelor of Science, Major in Animal Science, Pre-Veterinary Medicine
- Bachelor of Science, Animal Science, Minor in Conservation Biology
- Bachelor of Science, Animal Science, Minor in Wildlife Management
- Bachelor of Science, Major in Plant and Soil Sciences
- Bachelor of Science, Major in Interdisciplinary Agriculture with Teaching Certification
- Bachelor of Science, Major in Animal Science with Teaching Certification
- Bachelor of Science, Major in Agricultural Business with Teaching Certification
- Bachelor of Science, Major in Plant and Soil Sciences with Teaching Certification
- Career and Technology Program Bachelor of Applied Arts and Sciences
- Minor in Agricultural Business
- Minor in Agricultural Engineering Technology
- Minor in Animal Science
- Minor in Equine Science
- Minor in Plant and Soil Sciences
- Minor in Wildlife Ecology

## Student Organizations

- Ag Ambassadors
- Agricultural Business Association
- Agricultural Communicators of Tomorrow
- Agricultural Engineering Technology Club
- Alpha Gamma Rho Fraternity
- ALCA/PLANET Landscape
- Beef Cattle Show Team
- Block and Bridle
- Collegiate FFA
- Delta Tau Alpha - National Agricultural Honor Society
- Horse Judging Team
- Horsemen's Association
- Horticulture and Crop Sciences Club
- Livestock Judging Team
- Minorities in Agriculture, Natural Resources and Related Sciences
- National Agri-Marketing Association
- Pre-Vet Society
- Ranch Horse Team
- Rodeo Club
- Sigma Alpha – Professional Agricultural Sorority
- Wildlife Society

## Internships

An internship in agricultural sciences is intended to provide experience-based learning opportunities for students in their respective discipline of study. Students generally seek an internship experience at the end of their sophomore or junior year. The course identified for internship credit in agriculture is AGRI 4396. Internships may be arranged through student contact with providers or through departmental faculty and staff announcements and

postings. All internships must receive departmental approval through application prior to the initiation of the internship. Maximum credit for internship is six (6) credit hours.

## Scholarships

The department is pleased to have available approximately 90 scholarships for students majoring in agricultural sciences. Scholarships range in value from \$1,000 per year to \$16,000 over a 4-year period. Almost all of these scholarships are a one-time award and are awarded on an annual basis. A student may reapply in subsequent years if eligibility requirements are met. A few of our scholarships are renewed automatically for a period of 4 years if eligibility requirements are met.

The Scholarships 4Kats (<http://www.shsu.edu/dept/financial-aid/scholarships>) program must be used to apply for departmental scholarships. The program enables you to apply for all scholarships for which you are eligible, including those outside the Department of Agricultural Sciences. The deadline for departmental scholarships and university-wide scholarships is November 1; non-departmental scholarship deadlines vary.

### CONTACT:

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Department of Agricultural Sciences  
PO Box 2088, Huntsville, TX 77341  
(936) 294-1219

## SHSU Rodeo Scholarships

The scholarships below are available through the Sam Houston Rodeo program. The application deadline is July 1. Rodeo scholarships are one-time awards and not automatically renewable. Many rodeo scholarships are skills and performance based.

Applications are available through the University's Scholarship4Kats (<http://www.shsu.edu/dept/financial-aid/scholarships>) program.

- Byrd Family and Friends of Rodeo Scholarship
- Copenhagen/Skoal – U. S. Tobacco Scholarship
- SHSU Rodeo Team Scholarship
- Joshua Farris Memorial Endowed Scholarship
- Sonny Sikes Rodeo and the Sikes Family Endowed Scholarship
- Texas Best Rodeo Endowed Scholarship
- Tommy Castenson Memorial Scholarship
- Wes Neyland Memorial Endowed Rodeo Scholarship

### CONTACT:

Edward "Bubba" Miller  
Department of Agricultural Sciences  
PO Box 2088, Huntsville, TX 77341  
(936) 294-3867; elm014@shsu.edu.

## Agricultural Communications

### ACOM 2396. Special Topics in Agriculture Communications. 3 Hours.

This course will examine special topics/issues in Agricultural Communications at an introductory level. This course may be repeated up to three times as topics and subject matter changes. Credit 3.

### ACOM 3360. Communication Skills for Agriculturists. 3 Hours.

Provides an overview of information systems, principles and procedures used in communicating agricultural news and information in various agricultural professions. Emphasis is placed on effective written and oral communication means in professional and media environments in addition to public relations efforts in the fields of agricultural education and agribusiness. Sophomore standing. Only IAGR, IAGA, IAGB, IAGE, IAGH, and ACOM majors.

**Prerequisite:** ENGL 1302.

### ACOM 4369. Special Topic. 3 Hours.

## Agribusiness

### AGBU 2317. Principles Of Agri Economics. 3 Hours.

This course introduces concepts such as economics, supply and demand analysis, cost of production and market price risk; all related to practical application to agriculture.

**Prerequisite:** College-level ready in Mathematics, Reading and Writing and completed 15 credit hours.

**AGBU 2385. Analysis of the Agr Sector. 3 Hours.**

This course provides an overview of the various sectors and institutions servicing agriculture. Focus is on the marketing efforts and added value that each sector provides to farm products. The course emphasizes the structure of each area, and the trends that shape their activities. An introduction to marketing activities with emphasis on agricultural commodities is also provided.

**Prerequisite:** College-level ready in Mathematics, Reading and Writing and completed 15 credit hours.

**AGBU 2389. Agribusiness Financ'l Analysis. 3 Hours.**

Introduction to financial management for agricultural enterprises. Topics include: depreciation, balance sheet, income and expense, production records, income tax principles, enterprise budgeting, partial budgeting, cash flow budgeting, and analysis and interpretation of farm records.

**Prerequisite:** College-level ready in Mathematics, Reading and Writing, and completed 15 credit hours.

**AGBU 2396. Spec Top in Ag Business. 3 Hours.**

This course will examine special topics/issues in Agricultural Business at an introductory level. This course may be repeated up to three times as topics and subject matter change.

**AGBU 3350. Agribusiness For Ag Sci Teachr. 3 Hours.**

This course is designed to present agribusiness concepts that are included in the curriculum of post-secondary schools of Texas. Subjects include budgeting, finance, insurance, organization and management, marketing and government policies.

**Prerequisite:** CISE Minors only, Sophomore standing, and AGBU 2317.

**AGBU 3361. Agribusiness Org & Mgt. 3 Hours.**

Management principles relevant to agribusiness firms, marketing management, e-commerce and value-added agriculture, managerial concepts, human resource management, and business organizations.

**Prerequisite:** AGBU 2317, AGBU 2389 and completed 45 credit hours.

**AGBU 3367. Agricultural Finance. 3 Hours.**

Advanced agribusiness management applications of borrowed capital to operations; methods of determining loan needs for farmers; budgeting incomes to facilitate repayment of loans; cost of using borrowed capital; management of financial resources in agribusiness; and time value of money applications.

**Prerequisite:** AGBU 2389 with a grade of C or higher, and completed 45 credit hours.

**AGBU 3385. Quant Mthds for Agribusiness. 3 Hours.**

This course presents analysis tools from the fields of economics, statistics, and management as they relate to agricultural business decision making. The analytical and quantitative principles are applied to a variety of agricultural business situations. Topics include forecasting, decision analysis, and linear programming. Computer-based methods are emphasized.

**Prerequisite:** STAT 1369 or MATH 1369 and MATH 1324 and completed 45 credit hours.

**AGBU 4319. Agribusiness Ventures. 3 Hours.**

In this course, students investigate the initiation of new food and agricultural enterprises through identification of innovative opportunities. Effective entrepreneurial behaviors, environment analysis, and risk management for start-ups will be emphasized.

**Prerequisite:** AGBU 3361.

**AGBU 4340. Agribusiness Marketing. 3 Hours.**

A study of the major marketing strategies and decisions that must be made by agribusiness firms, including target market selection, marketing research, sales forecasting, product policies, distribution channels, pricing, advertising, and market control. The development of a strategic marketing plan for an agribusiness firm will be required.

**Prerequisite:** AGBU 2317 and AGBU 2385, and completed 45 hours.

**AGBU 4362. Natural Resource Economics. 3 Hours.**

A contemporary study of issues in land, natural resource and environmental economics. Topics include energy, forests, population, fisheries, world food production, and minerals and pollution. This course discusses market efficiency relative to allocations of natural resources and pollution.

**Prerequisite:** AGBU 2317 and Junior standing.

**AGBU 4363. Agricultural Sales & Consulting. 3 Hours.**

This course presents the principles of professional sales techniques used by food and agricultural firms. Necessary skills required in the agribusiness industry such as interpersonal skills, sales techniques, and sales forecasting skills are developed and enhanced.

**Prerequisite:** AGBU 2317, AGBU 2385 and completed 45 credit hours.

**AGBU 4365. Legal Issues in Agribusiness. 3 Hours.**

This course will examine legal concepts and practical legal problems facing rural residents, farmers, agribusiness and local government. Taught from a "preventive" perspective, students will acquire legal awareness necessary to become an effective and analytical agribusiness decision maker. Legal issues will include statutes, common law (cases), customs, and business and administrative regulations.

**Prerequisite:** AGBU 2317 and completed 45 credit hours.

**AGBU 4369. Special Topic. 3 Hours.**

Individual study in specialized areas of Agricultural Business. To be directed and approved by the Agricultural Business advisor. This course is designed to be a multi-topic course. The student can take the course under various special topics being offered.

**Prerequisite:** Junior standing.

**AGBU 4374. Agr Mkt Analysis & Prices. 3 Hours.**

Principles of agricultural market analysis to include: price analysis, price forecasting, forward contracting, futures market, market structure analysis, marketing and sales management.

**Prerequisite:** AGBU 2317 and MATH 1369 or STAT 1369, and completed 45 credit hours.

**AGBU 4375. Advanced Agribusiness Mgt. 3 Hours.**

This course serves as a capstone course for agribusiness majors. Contemporary issues related to agribusiness are approached using information systems, industry representatives, field trips, and class presentations.

**Prerequisite:** AGBU 3367 and AGBU 4361 or AGBU 3361, and completed 90 credit hours.

**AGBU 4377. Economics Of Land Use & Planng. 3 Hours.**

This course applies economic principles and legal policy relative to the allocation and conservation of natural resources and the environment. Topics such as land use, energy policy, forestry, fisheries, water rights, animal rights, world food production, and pollution are discussed in an economic and legal framework.

**Prerequisite:** Junior standing.

**AGBU 4378. Farm & Ranch Management. 3 Hours.**

Focus on planning for the most efficient resource allocation in agricultural operations. This course uses previously taught financial management practices and applies that to an agricultural industry case study.

**Prerequisite:** AGBU 3367 AND AGBU 3385.

**AGBU 4386. Agriculture & Food Policy. 3 Hours.**

This course examines and analyzes the effects of government participation on farmers, ranchers, agribusiness firms and consumers. Topics include the policy making process and the analysis of commodities, conservation, food safety, international trade, rural development programs, and the interrelationship of agriculture and agribusiness.

**Prerequisite:** AGBU 2317 and completed 75 credit hours .

## Agricultural Education

**AGED 2396. Spec Top in Ag Education. 3 Hours.**

This course will examine special topics/ issues in Agricultural Education at an introductory level. This course may be repeated up to three times as a topics and subject matter changes. Credits 3.

**AGED 3310. Teaching Ag Technology. 3 Hours.**

Methods in delivering instruction in agricultural technology. Principles in managing high school agricultural mechanics laboratories in a safe and efficient manner. Intended for SED minors. Junior standing. Approval by Instructor.

**Prerequisite:** AGRI 2302 or ITEC 1390 or ITEC 1361.

**AGED 3320. Interdiscip Agr Sci & Technol. 3 Hours.**

This course is designed to develop competencies of agricultural science teachers to teach essential elements in agricultural business, agricultural mechanization, animal science, and horticulture and crop science. CISE minors only.

**Prerequisite:** Completed 55 Hours.

**AGED 4096. Independent Studies. 1-3 Hours.**

Arranged professional and developmental learning experiences incorporating a practical application of agricultural education skills and practices. To include internships, individual research and industry studies. May be repeated for credit up to six hours.

**Prerequisite:** Sophomore standing.

**AGED 4364. Methds Tchng Agricultural Sci. 3 Hours.**

A study of the professional competencies required for the teaching of agricultural science. Included is the development of curriculum and occupational education programs as well as evaluation of teaching techniques, procedures, and resource materials. Methods of teaching the handicapped will be discussed. Must be currently enrolled in AGED 4380, AGED 4365, and AGED 4366. Senior standing. Admission to the Student Teaching Program.

**Prerequisite:** Grade of C or better in AGRI 3320 and CISE 4364.

**AGED 4365. Std Tchng Agricultural Science. 3 Hours.**

Senior standing. Must be currently enrolled in AGED 4364, AGED 4380, and AGED 4366.

**Prerequisite:** Grade of C or better in AGRI 3320 and CISE 4364.

**AGED 4366. Std Tchng Agricultural Science. 3 Hours.**

Directed observation and student teaching in an approved high school agricultural science classroom are required. Participation is essential in related agricultural science and FFA activities such as fairs, shows, contests, FFA alumni and young farmer programs, etc. Must be currently enrolled in AGED 4380, AGED 4365, and AGED 4366. Senior standing. Admission to the Student Teaching Program.

**Prerequisite:** Grade of C or better in AGRI 3320 and CISE 4364.

**AGED 4369. Special Topics In Agri Edu. 3 Hours.**

This course will examine special topics/issues and(or) subject matter in the field of agricultural education. Different subject matter can be addressed each semester. This course may be repeated as topics and subject matter change.

**Prerequisite:** Junior standing.

**AGED 4380. Respnsblty Of Pro Agr Sci Edu. 3 Hours.**

This course is designed to assist future agricultural science and technology teachers in understanding the structure, organization, and management of public schools at the national, state, and local levels. Course content will include a study of the needs of the special learner, school finance and funding for career and technical education programs, agricultural science curriculum and graduation requirements, and cultural issues. The course will also focus on professionalism, program planning, personnel employment and evaluation, and legal issues critical to the success of agricultural science and technology teachers. Must be currently enrolled in AGED 4364, AGED 4365, and AGED 4366. Admission to the Student Teaching Program.

**Prerequisite:** Grade of C or better in AGRI 3320 and CISE 4364.

**AGED 4388. Agr Sci & Tech Program Mgt. 3 Hours.**

This course focuses on developing and managing the youth leadership aspect of agricultural science and technology programs in public schools. Students will learn about leadership and career development events, the agricultural education record book documentation system, program of activity development, financial management, student and chapter awards programs, and scholarships for agricultural education students.

**Prerequisite:** Completed 55 hours.

**AGED 4394. Ag. Ed. Learning Environments. 3 Hours.**

In this course, students examine classroom management and discipline approaches appropriate in secondary agricultural education (AGED) classrooms and laboratories. Proactive and preventative measures will be discussed to ensure student safety and a successful learning environment.

**Prerequisite:** Admission to student teaching.

## Agricultural Engineering Technology

**AGET 2301. Fund Ag Power Units & Ctrl Sys. 3 Hours.**

Selection, maintenance and service of agricultural power units including small engines overhaul and preventive maintenance on agricultural tractors.

**AGET 2303. Intro to Ag Engineering Tech. 3 Hours.**

Introduction to current and emerging topics and industry related to agricultural engineering technology. Topics covered include: bio-diesel, wind energy, GPS/GIS applications, nanotechnology, theory of fusion of metals, efficiency of internal combustion engines, and other technology-related subjects.

**Prerequisite:** None.

**AGET 2396. Spec Top in Ag Engineer Tech. 3 Hours.**

This course will examine special topics/issues in Agricultural Engineering Technology at an introductory level. This course may be repeated up to three times as topics and subject matter changes.

**AGET 3300. Agricultural Electrification. 3 Hours.**

Principles and theory of electricity and applications in agriculture. Topics covered will include the transmission and distribution of electricity, Ohm's Law, DC/AC current, safety, NEC, converting bio-mass to electrical power, peak demand, dispatchable power, wind energy, photo-voltaic cells, and net-metering. Sophomore standing.

**Prerequisite:** AGET 2303 or ETDD 1361.

**AGET 3380. Agricultural Machinery. 3 Hours.**

Design, construction, adjustment, operation and testing of agricultural machinery and equipment systems. Topics include theoretical and effective capacities, costs of operation, valuation of used equipment and queuing theory. Sophomore standing. Completed 55 hours.

**Prerequisite:** AGET 2303 or ETDD 1361.

**AGET 3383. Soil & Water Conservation Engr. 3 Hours.**

This course includes principles of soil and water conservation, erosion control, storm water management, structures for floodwater routing, culvert design, design of waterways, and retention basins. Plane surveying, topographic mapping, geographical information and global positioning systems will be utilized. Sophomore standing.

**Prerequisite:** AGET 2303 or ETDD 1361.

**AGET 3386. Agricultural Structures and Environmental Control Systems. 3 Hours.**

Functional requirements of agricultural buildings; valuation, appraisal and estimating; structural requirements of agricultural buildings; planning and designing major service and processing buildings. Topics discussed will include thermodynamics, confined livestock housing, and environmental controls. Junior standing.

**Prerequisite:** AGRI 2303 or ETDD 1361.

**AGET 4369. Special Topic. 3 Hours.****AGET 4381. Adv Agricultural Mechanics. 3 Hours.**

This course serves as a capstone course for agricultural science students with previous experience in the area of agricultural engineering technology. Teams will address and solve a complex problem and as a result may design and construct a building, trailer, or other equipment in the laboratory.

**Prerequisite:** AGET 2303 or ETDD 1361 and Junior standing.

**AGET 4384. Fusing & Joining of Metals & Non-Metals. 3 Hours.**

A comprehensive study of the theories, principles, and procedures of bonding and fusing metallic and non-metallic materials by the electric arc, oxy-fuel, and adhesive processes. Technical classroom instruction, laboratory exercises, and field trip experiences will involve selection and utilization of new and emerging technologies and equipment, workplace planning, supervision, and management. Junior standing.

**Prerequisite:** AGET 2303 or ETDD 1361.

**AGET 4385. Applied Electronics/Hydraulics. 3 Hours.**

Cutting edge applications and integration of electronic and hydraulic principles and applications in agricultural and industrial processes and distribution systems. Topics include Ohm's Law, Pascal's Law, and principles and theory of fluid dynamics. Junior standing.

**Prerequisite:** AGET 2303 or ETDD 1361.

**AGET 4387. Agricultural Engines & Tractor. 3 Hours.**

Principles of the internal combustion engine, fuel injection, carburetion, and computerized engine monitoring equipment. Selection, valuation, wear analysis, and maintenance of power units for agricultural and industrial applications including those powered by alternative fuels will be covered. Junior standing.

**Prerequisite:** AGET 2303 or ETDD 1361.

**AGET 4390. Turf & Cropland Irr & Drainage. 3 Hours.**

Design and selection of surface or sub-surface irrigation and drainage systems for golf courses, greenhouses, sports fields, crops, landscape applications, and construction sites. Principles of pressurized irrigation systems including crop water requirements, soil moisture, irrigation scheduling, sprinkler irrigation, trickle irrigation, pumps, pipelines, and irrigation wells will be covered.

**Prerequisite:** AGET 2303 or ETDD 1361 and Junior standing.

**AGET 4392. GPS Applications in Agriculture and Construction. 3 Hours.**

Global positioning and geographic information system software and equipment will be applied in settings involving precision farming and construction.

**Prerequisite:** AGET 2303 or ETDD 1361 and Junior Standing.

**AGET 4393. Renewable Energy Sources for Agriculture. 3 Hours.**

This course will familiarize students with existing and potential alternative energy sources and production capacities including wind, solar, bio-mass conversion, hydrogen, ethanol, vegetable oil, and bio-diesel. Impacts on the environment, ecological systems, world food supply, and economy will be studied.

**Prerequisite:** AGET 2303 or ETDD 1361.

**AGET 4396. Directed Study in Agricultural Engineering Technology. 3 Hours.**

Arranged professional development learning experiences incorporating a practical application of Agricultural Engineering Technology skills and practices. To include internships, individual research and industry studies. May be repeated for credit up to six hours.

**Prerequisite:** Sophomore standing.

## Agricultural Sciences

**AGRI 1131. Intro To Professional Leadership Skills. 1 Hour.**

An exploration of the career options available to professionals in agricultural sciences, education, and business. Specific requirements for the various professions are discussed by a series of guest speakers. Course is intended for beginning students.

**AGRI 1309. Computers in Agriculture. 3 Hours.**

This course is designed to acquaint students with software applications useful to agriculture and how various technological advances are applied in modern agricultural enterprises.

**AGRI 2396. Topics in Agriculture. 3 Hours.**

This course will examine special topics/issues in agriculture at an introductory level. Topics may be offered in: Agriculture, Animal Science, Agricultural Business, Horticulture and Crop Science, and Agricultural Engineering Technology. This course may be repeated up to three times as topics and subject matter changes.

**AGRI 4096. Independent Studies. 1-3 Hours.**

Arranged professional and developmental learning experiences incorporating a practical application of agricultural skills and practices. To include internships, individual research and industry studies. Course may be repeated for credit, max 6.

**Prerequisite:** Sophomore standing.

**AGRI 4100. Applied Agricultural Technology. 1 Hour.**

Arranged developmental learning experiences incorporating an application of agricultural skills and practices in an emphasis area of the student's choice. Individual study plans are devised by faculty to provide the student with broad-based knowledge.

**Prerequisite:** Sophomore standing.

**AGRI 4120. Professional Career Skills. 1 Hour.**

A review of current careers in agriculture with emphasis on professional and managerial opportunities. Includes preparation of resume, interview skills and other means of professional communication.

**Prerequisite:** Junior standing.

**AGRI 4350. Agricultural Biosecurity. 3 Hours.**

The purpose of this course is to study the potential spread and prevalence of contagious organisms, reproductive diseases and contaminants in the agriculture, food, fiber and natural resource industries. Concepts dealing with isolation, resistance, sanitation, containment, transportation, and food safety issues and potential economic impact to the agricultural industry and others are major topics.

**Prerequisite:** Junior standing.

**AGRI 4364. International Agriculture. 3 Hours.**

An overview of international trade issues and political and economic influences on world food and fiber production and distribution systems. When offered abroad, students will have the opportunity to visit agricultural production, processing, and transport facilities.

**Prerequisite:** Sophomore standing.

**AGRI 4369. Special Topics In Agriculture. 3 Hours.**

Individual study in specialized areas of Agricultural Science. To be directed and approved by the Agricultural Science advisor. This course is designed to be a multi-topic course. The student can take the course under various special topics being offered.

**Prerequisite:** Junior standing.

**AGRI 4371. Agricultural Safety & Health. 3 Hours.**

This course is designed to provide the student with a basic understanding of the hazards and necessary safety precautions associated with the food, fiber, natural resources and agricultural industry. Control strategies will be explored and prevention methods identified. Hazards examined include machinery, livestock, controlled spaces, pesticides, and other issues common to the food, fiber, natural resources and agricultural industry. Junior standing.

**Prerequisite:** AGRI 2302 or ITEC 1390 or ITEC 1361.

**AGRI 4388. Prin Agr Ldrshp Comm Develop. 3 Hours.**

Involves the study of the characteristics of leadership theory, parliamentary procedure, personal development, and organizational structure.

**Prerequisite:** Junior standing or higher.

## Animal Science

**ANSC 1119. Animal Science Laboratory. 1 Hour.**

Laboratory for ANSC 1319.

**Prerequisite:** Concurrent enrollment in ANSC 1319.

**ANSC 1319. Animal Science. 3 Hours.**

This is a basic course of study to acquaint students with the scope of animal science: origin, history and development of economically important species and breeds of livestock; concepts of selection, breeding, nutrition, management and research as applied to livestock production. Laboratory experiences (ANSC 1119) involve the practical skills needed to manage animal enterprises.

**Prerequisite:** Concurrent enrollment in ANSC 1119.

**ANSC 2321. Livestock Evaluatn & Selection. 3 Hours.**

This course is designed to present the basic principles and concepts in selection and evaluation of beef cattle, sheep, swine, and horses. The ability to present accurate and concise oral reasons for selecting and placing livestock is reviewed.

**ANSC 2330. Companion Animal Science. 3 Hours.**

This course is an overview of the companion animal industry, including species and breeds, feeding and nutrition, reproduction, anatomy and physiology, care, management, training, health, behavior, and current research topics related to companion animals.

**ANSC 2360. Animals And Society. 3 Hours.**

This course will acquaint the student with the broad role of animals in society from national, global and historic perspectives. The impact of animals and domestic livestock on economic, social and political policy will be discussed. Emphasis will be placed on agricultural and non-agricultural uses, societal and cultural perspectives, consumer influences, animal ethics, animal research, appropriate animal care, livestock quality assurance programs, animal welfare, animal rights and the animal-human bond.

**ANSC 2396. Spec Topics in Animal Science. 3 Hours.**

This course will examine special topics/issues in Animal Science at an introductory level. This course may be repeated up to three times as topics and subject matter changes. Credits 3.

**ANSC 3336. Livestock Marketing. 3 Hours.**

This course will be a study of livestock marketing techniques, cash sales, risk management, forward contracting, problem solving using real-time livestock marketing situations, and risk of ownership in hypothetical livestock operations.

**Prerequisite:** ANSC 1319 and Sophomore standing.

**ANSC 3363. Anatomy & Physiology of the Domestic Animal. 3 Hours.**

Introduction to anatomy and physiology of domestic animals. Aspects of the nervous, skeletal, muscular, circulatory, urinary, and endocrine systems are covered.

**Prerequisite:** ANSC 1319 and Sophomore standing.

**ANSC 3373. Animal Nutrition. 3 Hours.**

This course consists of a study of the processes of digestion, absorption, metabolism, physiology, and circulation. Each nutrient is studied from the standpoint of chemistry, sources, function, and metabolism.

**Prerequisite:** ANSC 1319 and Sophomore standing.

**ANSC 3376. Meat Science. 3 Hours.**

Lecture topics will include muscle and skeletal biology, conversion of muscle to meat, food-borne illnesses and HACCP. Labs will focus on the methods of harvesting, preparation, preserving, and storing meat. Junior standing.

**Prerequisite:** ANSC 1319.

**ANSC 3377. Meat and Muscle Biology. 3 Hours.**

In this course, students examine fundamental principles of muscle structure, function, fiber type, and repair, as well as the physiological transformation of muscle to an edible product. Additionally, students investigate how each of the characteristics of muscle will affect the ultimate quality of a product through its conversion into meat.

**Prerequisite:** ANSC 1319.

**ANSC 4310. Animal Growth & Performance. 3 Hours.**

A study of the physiological and endocrine system factors affecting growth and performance of domestic animals. The course includes the study of meat animal growth and developmental processes and factors that affect body/carcass composition, carcass quality and value.

**Prerequisite:** ANSC 3373 and Junior standing.

**ANSC 4336. Stocker & Feedlot Management. 3 Hours.**

The course will evaluate the basic principles involved in feeding, management, marketing and disease control of stocker and feedlot cattle for economical production of beef. A review of scientific knowledge and research advances will be applied to modern stocker and feedlot cattle operations. Junior standing.

**Prerequisite:** ANSC 1319.

**ANSC 4337. Behavior & Mgmt of Domest Anim. 3 Hours.**

This course will study behavior associated with domesticated animals. The effects of selective breeding, physical and social environments, and the developmental stage on social organization will be studied. Additionally, aggressive behavior, sexual behavior, productivity, and the training of domestic animals will be examined. Junior standing.

**Prerequisite:** ANSC 1319.

**ANSC 4339. Advanced Livestock and Horse Evaluation. 3 Hours.**

This course provides an advanced study of the visual appraisal, grading, and evaluation techniques affiliated with livestock and horses. The evaluation of conformation will be studied along with the influence of heredity and environmental factors, industry trends and standards, and performance and production factors. Junior standing.

**Prerequisite:** ANSC 2321 or ANSC 2390.

**ANSC 4360. Livestock Mgt Techniques. 3 Hours.**

Skills and knowledge pertaining to the production of beef cattle, swine, goats, sheep, and horses. Laboratory exercises involve various management practices and selection of livestock based on visual evaluation and genetic performance. This course is not intended for animal science majors. CISE minors only.

**Prerequisite:** ANSC 1319 and must have completed 55 hours of coursework.

**ANSC 4369. Animal Science Special Topics. 3 Hours.**

Individual study in specialized areas of Animal Science. To be directed and approved by the Animal Science advisor. This course is designed to be a multi-topic course. The student can take the course under various special topics being offered.

**Prerequisite:** Junior standing.

**ANSC 4376. Sheep & Goat Production & Mgt. 3 Hours.**

Application of basic genetic principles, physiology, and nutrition to practical sheep, meat goat and Angora goat production systems; management, health care and marketing of animals and fiber. Junior standing.

**Prerequisite:** ANSC 1319.

**ANSC 4380. Beef Cattle Production & Mgmt. 3 Hours.**

A study of basic principles and methods of breeding, nutrition, reproduction, management, marketing, and disease control relating to various segments of the beef industry. Application of the latest bovine research is reviewed. Laboratory exercises involve practical skills relating to performance records and management of beef cattle.

**Prerequisite:** ANSC 1319 and Junior standing.

**ANSC 4389. Animal Reproduction. 3 Hours.**

Physiology of the male and female reproductive tract; hormones governing reproduction; the estrous cycle; mating; gestation; parturition; lactation; artificial insemination; embryo transfer technology; and factors affecting reproductive efficiency of common animal species used for agricultural purposes. Junior standing.

**Prerequisite:** ANSC 1319.

**ANSC 4394. Animal Feeds And Feeding. 3 Hours.**

A study of the characteristics of feedstuffs, a review of the essential nutrients and digestion, ration and mixture formulation, feeding methods, and nutritional management of beef, swine, sheep, goats, poultry, and horses. Exercises will consist of practical applications in formulating rations for livestock using conventional techniques and computers.

**Prerequisite:** ANSC 3373 and Junior standing.

**ANSC 4395. Animal Breeding & Genetics. 3 Hours.**

The application of genetic principles to livestock improvement. Study of genetic basis of selection and systems of mating, and the development of breeding programs based on the principles of population genetics.

**Prerequisite:** ANSC 1319 and Junior standing.

**ANSC 4398. Animal Diseases & Public Hlth. 3 Hours.**

This course will study diseases shared in nature between animals and man. Emphasis will be placed on how these diseases exist in natural environments, modes of transmission and methods of control and prevention. The course will cover infectious agents and the clinical signs that they cause in both man and animal.

**Prerequisite:** ANSC 1319 and junior standing.

## Equine Science

**EQSC 2364. Equine Science. 3 Hours.**

A survey of the working and pleasure horse industry; breed selection, breeding, feeding, diseases, unsoundness and management. Laboratory work involves evaluation, care and grooming, tack and equipment, and basic management.

**Prerequisite:** ANSC 1319.

**EQSC 2390. Selection & Eval Of Horses. 3 Hours.**

This course will allow the student to become familiar with the basic concepts necessary to select and evaluate horses from a judge's perspective. Evaluation of conformation, balance, symmetry, cadence, suppleness, and impulsion will be used to understand these concepts. The ability to prepare and present oral reasons to support critical thinking and decision making skills will be reviewed.

**EQSC 2396. Special Topic. 3 Hours.**

This course will examine special topics/issues in Equine Science at an introductory level. This course may be repeated up to three times as topics and subject matter changes. Credits 3.

**EQSC 3340. Equine Behavior & Training I. 3 Hours.**

This course will aid in developing skills to increase horsemanship ability and knowledge so that the student can more effectively communicate with the young horse. The fundamentals of equine behavior will be studied. Ground training methods will also be applied to teach the young horse discipline while increasing the training and value of the horse. Stable management, equipment, and pedigrees will also be discussed. Sophomore standing.

**Prerequisite:** EQSC 2364 or concurrent enrollment.

**EQSC 4096. Directed Study. 1-6 Hours.**

Arranged professional and developmental learning experiences incorporating a practical application of equine skills and practices. To include internships, individual research and industry studies. Variable Credit (1-6).

**Prerequisite:** Sophomore standing.

**EQSC 4367. Stock Horse Equitation. 3 Hours.**

The course will be an in-depth study of equitation including simple and advanced maneuvers that are essential to various types of equine performance events. Students will be expected to strengthen communication skills between horse and rider through various exercises. The university equestrian team will be developed from this course. Junior standing.

**Prerequisite:** EQSC 3340.

**EQSC 4369. Special Topic. 3 Hours.**

Individual study in specialized areas of Equine Science. To be directed and approved by the Animal Science advisor. This course is designed to be a multi-topic course. The student can take the course under various special topics being offered.

**Prerequisite:** Junior standing.

**EQSC 4373. Equine Reproduction. 3 Hours.**

General principles and applications of equine reproduction will be presented. Course material will include reproductive anatomy of the mare and the stallion and endocrinology as related to reproduction.

**Prerequisite:** EQSC 2364 and Junior standing.

**EQSC 4379. Equine Nutrition. 3 Hours.**

An overall evaluation of the equine digestive system in regards to anatomy, physiology, digestive processes, nutrient requirements, feedstuffs, management, and health care. Current topics in equine nutrition research will also be discussed. Junior standing.

**Prerequisite:** EQSC 2364.

**EQSC 4391. Equine Behavior & Training II. 3 Hours.**

A study of equine behavior, safety, and training techniques. Laboratory work involves planning record keeping systems, feeding and breeding schedules, tack and equipment, training young stock for work and pleasure, and specialized management practices.

**Prerequisite:** EQSC 3340 and Sophomore standing.

## Plant and Soil Science

### **PLSC 1107. Plant Science Laboratory. 1 Hour.**

Laboratory for AGRI 1307.

**Prerequisite:** Concurrent enrollment in AGRI 1307.

### **PLSC 1307. Plant Science. 3 Hours.**

(SH Prior Course ID: AGR 165, AGRI 1307) Basic plant morphology, classification, propagation, and crop improvement are topics discussed along with growth and development of crop plants. An introduction to soils, climate, and plant protection follow with a final overview of the major groups of cultivated plants.

### **PLSC 2375. Turfgrass Science. 3 Hours.**

(SH Prior Course ID: AGR 275); A study of the major turfgrass species grown in the U.S. and throughout much of the world. Explores differences in management, culture, and varietal selection for athletic, ornamental, and utility turfs. Credit 3 (Lec 3/Lab 0).

**Prerequisite:** None.

### **PLSC 2395. Ornamental Plant Identification. 3 Hours.**

Identification, growth characteristics, culture and use of common landscape and greenhouse plants. Materials include trees, shrubs, vines, groundcovers, turf grasses and floriculture crops. Emphasis is placed on temperate region plants.

**Prerequisite:** PLSC 1307.

### **PLSC 2396. Spec Top in Plant&Soil Science. 3 Hours.**

This course will examine special topics/issues in Plant and Soil Science at an introductory level. This course may be repeated up to three times as topics and subject matter change.

### **PLSC 2399. Floral Design. 3 Hours.**

Principles and elements of design illustrated with the use of floral materials; techniques involved in design and construction of floral arrangements; history and utilization of floral art in society.

### **PLSC 3374. Production & Mgt Ornamentals. 3 Hours.**

This course is designed to cover the principles and techniques involved in the production and management of nurseries and greenhouse crops including ornamental trees, shrubs, annuals, and perennials.

**Prerequisite:** PLSC 1307 and Sophomore standing.

### **PLSC 3379. Turfgrass Culture. 3 Hours.**

Principles of sexual and asexual propagation of major turf species, soils and rooting media, nutrient management, irrigation, pest control, and selection of appropriate cultivars are covered in this course.

**Prerequisite:** PLSC 1307 and Sophomore standing.

### **PLSC 3395. Plant Propagation Techniques. 3 Hours.**

Principles and practices involved in propagation of plants are discussed in detail. Emphasis is placed on sexual and asexual methods of propagation and the biochemical/hormonal factors involved. Propagation techniques of several horticultural crops will be covered and practiced.

**Prerequisite:** PLSC 1307/1107 and Sophomore standing.

### **PLSC 3398. Landscape Design I. 3 Hours.**

This course covers principles, elements, and factors to be considered in preparation, planning, and design of a residential landscape. Emphasis will be placed on the incorporation of plant materials into basic landscape design.

**Prerequisite:** PLSC 1307 and Sophomore standing.

### **PLSC 3440. Soil Science. 4 Hours.**

An introduction to the physical, biological, and chemical properties of soils and their relationships to soil formation, soil fertility, soil temperature, soil-plant-water relations, pH and liming, and conservation of soils. Environmental issues are also discussed. Sophomore standing.

**Prerequisite:** PLSC 1307 and CHEM 1306, CHEM 1307, CHEM 1311, or CHEM 1312.

### **PLSC 4320. Fruit & Vegetable Production. 3 Hours.**

This course is a comprehensive study of the fruit and vegetable industry in the United States. Topics of study include climatic requirements, growth characteristics, cultural practices, and pest control strategies.

**Prerequisite:** PLSC 1307.

### **PLSC 4330. Soil Fertility Mgt Fertilizers. 3 Hours.**

Principles of soil fertility, water, nutritional, and climatic relationships. Emphasis will be placed on sources of soil nutrients including commercial fertilizers and biological resources.

**Prerequisite:** PLSC 3440 and Junior standing.

### **PLSC 4358. Landscape Operations. 3 Hours.**

The students in the course examine the principles and techniques of constructing and managing amenity landscapes. Emphasis is placed on contract documents, specifications of work, plant establishment, management plans, pruning, soil modification, and building materials.

**Prerequisite:** PLSC 1307.

**PLSC 4368. Landscape Design II. 3 Hours.**

This course is a continuation of AGRI 3398. Design skills will be refined as students will experience more variety in design opportunities. Both small residential and larger public spaces will be the subjects of student designs. Effective graphic presentations will be stressed. Installation, maintenance, and management of residential landscapes will also be discussed.

**Prerequisite:** PLSC 1307 and Junior standing.

**PLSC 4369. Special Topic. 3 Hours.****PLSC 4370. Forage Crops & Pasture Mgmt. 3 Hours.**

Quality evaluation, adaptation, selection, culture and management of the more important plants used for pasture, hay and silage. Particular attention is given to those species grown commonly throughout the southeastern US.

**Prerequisite:** Junior standing.

**PLSC 4372. Sports Turf Management. 3 Hours.**

Facility design and construction, water management, soil modification, and unique management practices commonly applied to golf courses and other sports turfs will be covered. Management of budgets, personnel, equipment maintenance and irrigation scheduling are also covered. Junior standing.

**Prerequisite:** PLSC 1307 and PLSC 3440.

**PLSC 4383. Range Management. 3 Hours.**

With rangelands comprising the majority of lands in the western US, this course deals with forage-animal management topics common to the semi-arid and arid regions of the US. Addresses the unique management requirements of rangelands, the use of government-owned lands, and the competing uses of rangelands for livestock production, wildlife habitat, and recreational areas for humans. Junior standing.

**Prerequisite:** PLSC 1307 or BIOL 1411.

**PLSC 4397. Integrated Pest Management. 3 Hours.**

A comprehensive review of current cultural, biological, mechanical, and chemical techniques used in managing or controlling agricultural and residential pests. Attention is given to environmental hazards, application methods, and safety precautions in handling and storage of pesticides.

**Prerequisite:** AGRI 1307 and Sophomore standing.

## Wildlife Management

**WMGT 2301. Principles of Wildlife Mgmt. 3 Hours.**

The students in this course survey sustainable and profitable wildlife management techniques, habitats, and resources. Topics include alternative wildlife practices, animal and plant identification, ethical and economical considerations of wildlife and fisheries management, conservation, habitat alteration and renewal, and economic impact of the wildlife industry.

**WMGT 2396. Special Topic. 3 Hours.**

This course will examine special topics/issues in Wildlife Management at an introductory level. This course may be repeated up to three times as topics and subject matter changes. Credits 3.

**WMGT 3301. Wildlife Ranch Management. 3 Hours.**

The students in this course evaluate establishing, managing, and maintaining wildlife enterprises. The focus of this course is designing a profitable and sustainable ranch using both scientific and economic perspectives regarding livestock, as well as native and non-native wildlife species.

**Prerequisite:** WMGT 2301.

**WMGT 3350. Cervid Fawn Care. 3 Hours.**

Students examine the care of young cervid species from parturition to weaning with a main focus on white-tailed deer. Topics may include diagnosing and treating sick fawns, active and passive antibody transfer, fawn handling, immobilization, health, and birthing and weaning protocols.

**Prerequisite:** WMGT 2301.

**WMGT 3381. Game Animal Production. 3 Hours.**

A study of the principles and practices of game animal production. Game animals commonly used for economic diversification of agricultural enterprises are the central focus of the course. Topics include animal identification, population dynamics, nutrition, habitat preservation and modification, reproduction, game laws, and economic integration in traditional agricultural enterprises.

**Prerequisite:** ANSC 1319 and Sophomore or higher classification.

**WMGT 3382. Habitat & Pond Management. 3 Hours.**

Students in the course study wildlife habitat and riparian zone management, food plots for upland game birds and white-tailed deer, and pond management for largemouth bass, sunfish, and catfish production.

**Prerequisite:** WMGT 2301.

**WMGT 4096. Directed Study. 1-6 Hours.**

Arranged professional and developmental learning experiences incorporating a practical application of wildlife management skills and practices. To include internships, individual research and industry studies. Variable Credit (1 to 6).

**Prerequisite:** Sophomore standing.

**WMGT 4301. Cervid Breeding and Production. 3 Hours.**

The students in this course will examine production of the cervid species with a focus on white-tailed deer. Reproductive management practices pertaining to preferred, selective genetics and breeding cycles are emphasized, with production based on an effective confinement management system. The primary topics include general industry cycles, reproductive techniques and cycles, weaning of offspring and vaccination protocols, immobilization, and interstate/intrastate movement of cervid species.

**Prerequisite:** WMGT 2301 and ANSC 4395.

**WMGT 4302. Cervid Management. 3 Hours.**

The students in this course examine the cervid industry from breeding to parturition. Cervid management is based on a confinement setting and focuses on anatomy and physiology, cervid nutrition during this stage of production, and feed types and feeding programs, cost of production, state and federal regulations, diseases and treatments, and fawn care.

**Prerequisite:** WMGT 2301 and ANSC 3373.

**WMGT 4340. Exotic Animal Production. 3 Hours.**

Students examine the multi-faceted exotic species industry in the state of Texas. Topics may include identification of species, habitat and nutritional needs, holding facility design, regulation and transportation requirements, marketing, cost of production, genetics, and determining market value.

**Prerequisite:** WMGT 2301.

**WMGT 4341. Upland Game Bird Management. 3 Hours.**

Students in this course conduct an in-depth investigation of upland game birds common in Texas. Topics may include identification, life cycles, plant and habitat identification, plant community succession, and the tools used to manage succession for successful upland game bird management.

**Prerequisite:** WMGT 2301.

**WMGT 4369. Special Topic. 3 Hours.**

Individual study in specialized areas of Wildlife Management. To be directed and approved by the Animal Science advisor. This course is designed to be a multi-topic course. The student can take the course under various special topics being offered.

**Prerequisite:** Junior standing.

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