

College of Agricultural Sciences and Natural Resources

Randy M Harp (Dean)

Location: Ag Building, Room 135, 903.886.5358

College of Agricultural Sciences and Natural Resources Web Site (<http://www.tamuc.edu/ag/>)

The College of Agricultural Sciences and Natural Resources offers degrees at both the baccalaureate and master's levels. A Bachelor of Science degree can be earned in several different majors, as described below.

Majors in the College of Agricultural Sciences and Natural Resources

Students seeking a bachelor's degree in any of the following majors must complete:

1. general requirements for a Bachelor of Arts or Science degree, and
2. Core Curriculum Requirements (<http://coursecatalog.tamuc.edu/undergrad/core-curriculum-requirements/>) (refer to those sections of this catalog).

In addition, courses in the major must be completed as shown below.

Pre-Professional Program for Veterinary Medicine

The College of Agricultural Sciences and Natural Resources also offers an undergraduate pre-professional program in pre-veterinary medicine. Students are advised to follow the pre-professional curriculum as well as pursue a degree in Animal Science. Students selecting the pre-veterinary program will be trained in biological, animal, chemical and physical sciences. For additional information, contact the pre-veterinary advisor, Dr. Douglas Eborn at 903.886.5676, Douglas.Eborn@tamuc.edu or Dr. Gregory Eckerle at 903.886.5717, Gregory.Eckerle@tamuc.edu.

Teacher Education Programs

Students interested in becoming a middle or high school teacher of Agricultural Science and Technology should contact Dr. Bob Williams (903-886-5350), the faculty advisor for specific information and appropriate course selection.

Minors in the College of Agricultural Sciences and Natural Resources

AgriBusiness B.A./B.S. (<http://coursecatalog.tamuc.edu/undergrad/colleges-and-departments/Agricultural-Sciences-and-Natural-Resources/agribusiness-ba-bs/>)

AEC 2317 - Agricultural Economics

Hours: 3

(AGRI 2317) A study of economic principles, with emphasis on their application to the solution of farm, agribusiness, and agricultural industry problems.

AEC 297 - Special Topics

Hours: 1-4

Organized class. May be repeated when topics vary.

AEC 301 - Trends in the Food Industry

Hours: 1-3

Analysis of current trends in the food industry, including norms, specifications, and standards; trade issues; and policies with national and international scope that affect the U.S. food industry. The focus is on developing an understanding of the causes and consequences of such trends, the various issues involved, and how they affect stakeholders and society. Prerequisites: Junior standing.

AEC 302 - Computer Applications in Agriculture

Hours: 3

An introductory course to computer applications with specific emphasis on applications used in agricultural businesses. Content includes spreadsheet management, word processing, and presentation applications.

AEC 304 - Farm Accounting

Hours: 3

The course covers the application of accounting principles as they apply to the production and marketing of agricultural products to analyze the financial performance and condition of the farm business.

AEC 314 - Farm Management

Hours: 3

Farm Management. Three semester hours. Techniques and procedures used for decision making in the farm business. Determination of optimum enterprise choice, resource combination and techniques of financial management, budgeting, and whole farm/ranch planning.

AEC 316 - Agricultural Marketing

Hours: 3

Agricultural Marketing. Three semester hours. A broad view of marketing; food markets and consumption; marketing functions and institutions. Applications of economic theory to agricultural price estimation, discovery, and determination.

AEC 324 - Farm Management Lab

Hours: 1

Students will be exposed to hands-on farm management problem-solving techniques using technology.

AEC 327 - Agricultural Sales

Hours: 3

This course introduces students to sales and principles of selling techniques for agricultural products and services, real estate, financial, and other industrial and institutional products and services. Students will develop skills to take advantage of career opportunities in the agricultural sales field.

AEC 340 - Agricultural Finance

Hours: 3

Agricultural Finance. Three semester hours. Analysis of capital investments, interpretation of financial statements, capital structure considerations for agricultural firms, farm real estate pricing, and financial intermediation in agriculture.

AEC 347 - Agricultural Price Theory

Hours: 3

Intermediate microeconomic principles with agricultural commodity applications related to market price determination, resource allocations, and government policies.

AEC 350 - Agricultural Finance Laboratory

Hours: 1

Students will be exposed to hands-on agricultural finance problem-solving techniques using technology.

AEC 360 - Agricultural Law

Hours: 3

Agricultural Law. Three semester hours. Survey of law and legal decisions that impact agriculture including farm and preservation, water rights, pollution abatement standards, workers' rights, externalities, pesticide/insecticide regulation, product inspection, development of legislation, mineral rights and employer liability. Prerequisite: Junior standing.

AEC 380 - Agricultural Statistics

Hours: 3

Principles and estimation techniques used in the analysis of agricultural data including measures of central tendency and dispersion, probability, sampling, hypothesis testing, analysis of variance, correlation coefficient, and regression. Prerequisites: MATH 1314 or MATH 1324.

AEC 389 - Independent Study

Hours: 0-4

Independent Study. One to four semester hours. Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisite: Consent of department head.

AEC 390 - Agricultural Statistics Laboratory

Hours: 1

Students will be exposed to hands-on agricultural statistics problem-solving techniques using technology.

AEC 435 - Agricultural Policy I

Hours: 3

Analytical treatment of historical, recent and current economic problems, and governmental policies influencing American agriculture and rural America. The focus is on developing an historical and conceptual understanding of the economics of agriculture and how public policy has and does influence the nature and performance of American agriculture.

AEC 445 - Natural Resource and Environmental Economics

Hours: 3

This course explores the approach that economists take to environmental and resource problems. It examines both the economic roots of environmental problems and the solutions that economists suggest. The course focuses on questions a policymaker must face in deciding how and when to regulate, including issues of efficiency and distribution.

AEC 455 - Commodity Futures and Options

Hours: 3

The objectives of this course are to understand why futures exchanges and commodity futures contracts exist; understand and be able to forecast basis; understand hedging and be able to design hedging strategies for various commodity producers and users; understand both put and call options and their potential use in a commodity risk management program; and understand the usefulness and shortcomings of fundamental and technical analysis.

AEC 489 - Indst Ag Economics

Hours: 1-4

Independent Study. One to four semester hours. Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisite: Consent of department head.

AEC 497 - Special Topics

Hours: 1-4

Special Topics. One to four semester hours. Organized class. May be repeated when topics vary.

AG 1131 - Intro To Agriculture

Hours: 1

(AGRI 1131) Introduction to agriculture and its relationship to the sciences. Also explores careers and opportunities in agriculture. Insights into the agriculture curriculum and course content are also presented. Required of all agriculture majors.

AG 201 - Biological Literature

Hours: 3

This course provides students with the fundamentals of scientific thinking and scientific writing. The course starts with a brief overview of the history and philosophy of science as it pertains to biology. Students will learn about empiricism, parsimony, and how to apply the scientific method to developing and testing hypotheses. Students will be taught how to write in scientific style; naming conventions, how to cite scientific names, how to avoid obfuscatory scriverny, establishing flow, organizing a scientific document, how to write an abstract, how to present scientific data and statistics, how to cite figures and tables, how to cite scientific sources, how to avoid plagiarism, and how to find scientific information. Concepts of bioethics will be presented at the end of the semester. Crosslisted with: BSC 201.

AG 297 - Special Topics

Hours: 0-4

Organized class. May be repeated when topics vary.

AG 300 - Professional Agricultural Communications

Hours: 1

Professional Agricultural Communications. One semester hour. Techniques of agricultural communication emphasizing principles involved in job search. Techniques of interviewing, resume writing, letters of inquiry, etc. For agriculture majors. Prerequisites: ENG 1301 and junior standing.

AG 314 - Comparative Vertebrate Physiology

Hours: 3

The course is a comparative study of basic physiological principles and functional organization with emphasis on the functioning of organ systems in various vertebrate classes and their adaptation to the environment leading to an understanding of evolutionary relationships. The course evaluates i) the mechanisms by which animals perform their life-sustaining functions, ii) the ways in which diverse phylogenetic groups of animals both resemble each other and differ, iii) the ways in which physiology and ecology interact, and iv) the importance of all levels of organization, from genes to proteins and tissues to organs, for the full understanding of physiological systems. Crosslisted with: BSC 314.

AG 315 - Ecological Genetics

Hours: 3

Ecological genetics is about how environmental and population-level processes affect the genetic structure of populations. The course begins with a basic overview Mendelian genetics followed by an in-depth study of population genetics and the intrinsic and extrinsic processes that influence the genetic composition of populations and metapopulations. Because the interaction between genes and the environment fundamentally affect the viability of populations, ecological genetics has broad relevance for understanding population stability and maintenance healthy populations. Crosslisted with: BSC 315.

AG 316 - Becoming a Wildlife Professional

Hours: 3

Working with wildlife can be a thrilling adventure steeped in the wonders of the natural world, but entering the field demands a strong personal commitment. Students will gain knowledge in the proper training and guidance needed to transform themselves into competitive applicants for wildlife jobs and forge successful careers. Student will learn about many entry-level jobs available for the next generation of wildlife biologists and conservationists. Over 100 diverse career options for aspiring wildlife workers will be presented, including work in biological field research, forestry, rehabilitation, ranching, photography, and refuge management. Students will learn the best ways to prepare for a vocation in the wildlife profession while obtaining pragmatic advice about applying for and obt Crosslisted with: BSC 316.

AG 335 - Wildlife Management I

Hours: 3

Wildlife Management I. Three semester hours. The purpose of this course is to introduce students to the many aspects of wildlife and conservation science. It will provide an introduction to the history of wildlife management and conservation, ecosystems and ecology, population modeling, animal behavior, food and cover, wildlife diseases, predators and predation, and hunting and trapping. Offered: FALL

AG 336 - Wildlife Management II

Hours: 3

Wildlife Management II. Three semester hours. This course is designed to complement Wildlife Management I and provides an introduction to the many aspects of wildlife ecology and conservation science. Topics covered include water and soils, farmlands, rangelands, and forests, parks and refuges, urban wildlife management, and non-game and endangered species. Students are required to participate in field trips designed to give practical experience in wildlife management techniques.

AG 337 - Field Methods in Wildlife and Conservation Science

Hours: 4

This course provides students with practical training in the methods used to collect quantitative data on plant and animal populations, animal movements and home ranges, habitat associations, and animal behavior. Field exercises are integrated with lecture material emphasizing study design, statistics, and data interpretation. Crosslisted with: BSC 337.

AG 338 - Wildlife Management Techniques

Hours: 3

This class will develop the principles and techniques for managing wildlife populations. Topics covered will include experimental design, hypothesis testing, scientific writing, techniques for capturing and marking wildlife, age and sex determination, parameter estimation (population size, density, survival, etc.), radio-telemetry, home range and resource selection. Students enrolled in this course must be willing to participate in a field-based classroom research project when and where feasible. Crosslisted with: BSC 338.

AG 339 - Becoming a Wildlife Professional

Hours: 3

Working with wildlife can be a thrilling adventure steeped in the wonders of the natural world, but entering the field demands a strong personal commitment. Students will gain knowledge in the proper training and guidance needed to transform themselves into competitive applicants for wildlife jobs and forge successful careers. Student will learn about many entry-level jobs available for the next generation of wildlife biologists and conservationists. Over 100 diverse career options for aspiring wildlife workers will be presented, including work in biological field research, forestry, rehabilitation, ranching, photography, and refuge management. Crosslisted with: BSC 339.

AG 350 - Introduction to Sustainable Agriculture

Hours: 3

This course introduces students to the common principles and practices associated with sustainable agriculture from ecological, economical, social, and ethical perspectives.

AG 352 - Urban Agriculture

Hours: 3

This course provides an extensive overview of agriculture and food security issues and practices at the local level in cities in the U.S. and abroad.

AG 392 - Appld Ethics US World Ag

Hours: 3

This course examines major, contemporary issues in agriculture and food policy with emphasis on the ethical aspects of each issue. Discussion focuses on assessing the particular economic, cultural, geographic, political, religious, technological and scientific principles with a moral and ethical framework. Course scope is approximately half U.S. domestic issues and half international issues. Prerequisite: Junior standing.

AG 397 - SPECIAL TOPICS

Hours: 1-4

Special Topics. One to four semester hours. Organized class. May be repeated when topics vary.

AG 400 - Seminar

Hours: 1

Seminar. One semester hour. Techniques involved in presenting scientific and technical oral reports. Oral presentations required. Prerequisites: Senior standing.

AG 402 - Ornithology

Hours: 3

This course begins with an overview of current theories regarding the origins of birds and flight. This is followed by a brief survey the living orders and their biogeography. Other topics include the mechanics and adaptations for flight, avian physiology and anatomy, migration, communication and behavior, ecology, and avian conservation. Prerequisites: BSC 301 with a minimum grade of C. Crosslisted with: BSC 402.

AG 404 - Vertebrate Biology

Hours: 3

This course takes a systematic approach to understanding vertebrate evolution, diversity and biology. It will follow the development of each vertebrate taxon through the fossil record from late Cambrian to the present. This is followed by discussions of vertebrate zoogeography, habitat and foraging, feeding modes, dispersal and migration, mating systems and parental care. Prerequisites: BSC 301 with a minimum grade of C. Crosslisted with: BSC 404.

AG 405 - Internship Agri-Industries

Hours: 3-6

Three to six semester hours. This course provides the opportunity for students to gain on-the-job experience in the preparation for careers in the rapidly growing agri-related areas of industry and business. Assignments will be at an approved work situation under supervision of a designated faculty member. Ten to twenty hours per week will be required.

AG 406 - Mammalogy

Hours: 3

The objective of this course is to survey the phylogenetic relationships, diversity, biology, and ecology of mammals, including an understanding of the characterization of the orders and families of the extant mammals based on morphological traits, evolutionary Crosslisted with: BSC 406.

AG 408 - Nutritional Biochemistry

Hours: 3

Nutritional Biochemistry - Three semester hours A course in biochemistry using nutrition as a model. Topics will include the energetics of metabolism, the structure and metabolism of proteins, carbohydrates, lipids and the integration of metabolic systems. Included also will be the chemistry of nitrogenous bases and how transcription and translation is accomplished on the cellular level. The course is 3-credit-hour class with 3 hours lecture and no lab (3,0). Prerequisites are ANS 407, CHEM 212, CHEM 314.

AG 415 - Upland Bird Ecology and Management

Hours: 3

Status, ecology, management, and conservation issues of North American upland game birds. Student will understand the role of upland game bird professionals. Develop knowledge of the status of North American upland game birds. Understand the basic principles of upland game bird ecology and management. Learn to apply knowledge to solve conservation problems. Crosslisted with: BSC 415.

AG 416 - Wildlife Population Biology

Hours: 3

Three semester hours (2 lec / 2 lab) This course outlines processes governing the abundance and distribution of animals and plants, and the consequences for natural resource management. Practical applications lie in wildlife management, sustainable harvesting of resources, pest control and conservation of endangered species. Topics will include mathematical models of population growth, population viability analysis, and metapopulations, dispersal, population harvesting, predation, population cycles, and competition. Prerequisites: Math 142 or MATH 2312. Crosslisted with: BSC 416.

AG 417 - Geospatial Mapping

Hours: 3

The course will provide basic knowledge of the fundamentals of Geographic Information Systems (GIS), including GIS theory and applications. The course will take a hands-on and problem solving approach to learning GIS and will cover basic GIS including map characteristics and projections, spatial data models, relational databases, and spatial analysis with a focus on natural resource research and management and environmental science. Crosslisted with: BSC 417.

AG 423 - Natural Resources Management

Hours: 3

An investigation of best management practices and conservation techniques used by landowners and managers to protect renewable natural resources from intensive agricultural production. Emphasis will be on preventing soil loss and contamination, maintaining water quality, and protecting wildlife habitat.

AG 435 - Wildlife Habitat Ecology and M

Hours: 3

This class will expose the student to the history and concepts of an animal's habitat beginning with the ideas of Aldo Leopold to current ideas of what habitat is. Students will be introduced to principles and techniques of habitat management as they apply to forest, rangeland, wetland, and agricultural ecosystems. Current concepts of Conservation Biology such as fragmentation, meta-population ecology, and corridor ecology will also be covered. Students enrolled in this course must be willing to attend field trips when and where feasible to see actual management practices conducted in the field. Crosslisted with: BSC 435.

AG 436 - Plant Diversity & Conservation

Hours: 3

The course focuses on patterns and distribution of plant diversity and threats to plant diversity. Range of strategies and approaches used in plant conservation will be discussed. Crosslisted with: BSC 436.

AG 438 - Wetland Ecology and Management

Hours: 4

Four semester hours (3 lec / 2 lab) This class will address the ecology of wetlands from a systems approach, starting first with what defines a wetland both legally and functionally, and covering important and defining principles of hydro-period, soils, wetland plants, wetland succession, delineation, and wetlands as wildlife habitat. The lab will immerse students in field exercises ranging from wetland plant collection and identification, and wetland bird identification. Students enrolled in this course must be willing to attend field trips when and where feasible to see different wetland types and the function and values they provide. Prerequisites: BSC 307. Crosslisted with: BSC 438.

AG 440 - Human Dimensions of Wildlife

Hours: 3

Human Dimensions of Wildlife Management explains how a wildlife professional can more effectively manage species and social-ecological systems by fully considering the role that humans play in every stage of the wildlife management process. Human Dimensions of Wildlife Management provides the essential information that students and practitioners need to be effective problem solvers to handle a variety of situations, such as managing deer populations in residential areas, encounters between predators and people, or managing citizen input on wildlife issues. Topics will include human dimensions of wildlife management and conservation, wildlife use (hunting and fishing), working with public and private landowners, involving citizen scientists, managing citizen input, using economics to inform Crosslisted with: BSC 440.

AG 462 - Agroecology

Hours: 3

AG 462 Agroecology is a three hour course to understand agroecological concepts that incorporate ideas about a more environmentally and socially sensitive approach to agriculture, one that focuses not only in production, but also in ecological sustainability of a production system. Crosslisted with: BSC 462.

AG 463 - Landscape Ecology

Hours: 3

AG 463 landscape Ecology is a three hour course designed to provide an overview of the relationships between ecological processes in the environment and particular ecosystems using a variety of landscape scales, development of spatial patterns, and organizational levels of research and policy. Crosslisted with: BSC 463.

AG 464 - Principles of Sustainability

Hours: 3

AG 464 Principles of Sustainability is a three hour course designed to provide an overview of the social and biological principles of sustainability. An emphasis will also be placed on understanding on the education, health, population dynamics, culture, agriculture, food security, and natural resources aspects of sustainability. Crosslisted with: BSC 464.

AG 489 - Indst Agricul Sci

Hours: 3

Independent Study. One to four semester hours. Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisite: Consent of department head.

AG 490 - H Honors Thesis

Hours: 0-6

AG 490 - H Honors Thesis Hours: 6 Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. Prerequisite Consent of head. Note May be repeated when the topic varies.

AG 491 - H Ind Honors Readings

Hours: 3

AG 491 - H IND HONORS RDGS Hours: 3 Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. Prerequisite Consent of head. Note May be repeated when the topic varies.

AG 497 - Special Topics

Hours: 1-5

Special Topics. One to five semester hours. Organized class. May be repeated when topics vary.

AGED 2301 - Agricultural Education Fundamentals and Curriculum Design

Hours: 3

This course is designed as an entry level program and will cover foundational elements of agricultural education history, philosophy, and theory. Additional emphasis will be placed on introductory principles of curriculum development and design.

AGED 3300 - Introduction to the Profession of Agricultural Education

Hours: 3

This course provides prospective agricultural educators with a beginning foundation for understanding learners, enhancing student achievement, and understanding the teaching environment. The course will emphasize the structure, organization, management, and governance of the American school system and current issues related to the semiprofessional legal, ethical, and multicultural foundations of teaching also will be discussed. Prerequisites: All requirements for admission to the teaching program within the College of Education including minimum overall GPA of 2.75 and TSI Complete. Note: Thirty clock hours of professional field experiences are required.

AGED 3301 - Experiential Learning and Leadership

Hours: 3

This course is an introduction to the history, philosophies, and practices of utilizing experiential learning within the context of agricultural education. Particular emphasis will be placed on identifying opportunities to transform experiences provided within the three-circle model of agricultural education into experiential learning.

AGED 297 - Special Topics

Hours: 1-4

Organized class. May be repeated when topics vary.

AGED 371 - Agricultural & Youth Leadershi

Hours: 3

Agricultural and Youth Leadership. Three semester hours. Application of leadership principles with emphasis on interpersonal and personal skills, organizational structure, and FFA and 4-H Club activities.

AGED 404 - Supervised Experience Programs

Hours: 3

Supervised Experience Programs - Three semester hours Theories and practices associated with experiential learning models used in secondary agricultural science programs and community-based youth programs.

AGED 465 - Student Tch Secondary Sch

Hours: 6

The student will teach in a selected school for a continuous period of 14 weeks under the joint supervision of local school officials and personnel of the University. The student teacher will engage in and develop, as nearly as possible, all professional competencies deemed essential in teaching an Agricultural Science and Technology program. Senior standing required. Prerequisite: PSY 300 With a grade of C or better. Admittance to the College of Education Teacher Certification Program with an approved Placement.

AGED 470 - Methods of Teaching Agricultural Science and Technology

Hours: 3

Professional skills deemed appropriate to and essential in the teaching of all phases of a local program of Agricultural Science and Technology will be developed. This course is taken during the student teaching residency semester. Senior standing required. Prerequisites: AGED 371.

AGED 471 - The Program of Instruction in Agricultural Science and Technology

Hours: 3

A "Comprehensive Program of Instruction" will be planned for each student, including courses of study for the secondary school, programs of activities for the FFA, resource use and parent/community relations. Philosophy and administration of secondary and community-based Agricultural Science and Technology programs will be emphasized. Senior standing required. Prerequisites: PSY 300 with a minimum grade of C.

AGED 489 - Independent Study

Hours: 1-6

Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies.

AGED 497 - Special Topic

Hours: 1-4

Organized class. May be repeated when topics vary.

AMC 2303 - Agricultural Welding Techniques

Hours: 3

(AGRI 2303) Three semester hours (2 lec / 2 lab) Introduction to oxy-fuel cutting/welding, shielded metal arc welding, and gas metal arc welding processes in context of applications in agricultural equipment repair and fabrication.

AMC 297 - Special Topics

Hours: 1-4

AMC 315 - Agri Systms Technology Mgmt

Hours: 3

Agricultural Systems Technology Management. Three semester hours (2 lecture, 2 lab). Preliminary study to acquaint student professionals with the principles and theories needed to comprehend and manage agricultural and environmental technology; introduce the application of information technology to agricultural and environment systems; develop mathematical concepts and unit analysis skills associated with machinery and equipment, industry and marketing, energy, structural and environmental and natural resource systems. Focus shall be on basic knowledge rather than on in-depth analysis of the systems covered. Prerequisites: Math 141 or consent of the instructor.

AMC 389 - Independent Study

Hours: 1-4

Independent Study. One to four semester hours. Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisite: Consent of department head.

AMC 397 - Special Topics

Hours: 1-4

Special Topics - 1-4 Semester Hours

AMC 424 - Agricultural Safety

Hours: 3

Three semester hours (2 lec / 2 lab) Principles and strategies for implementing safety training and reducing risk of injuries in agricultural enterprises including shop and machinery operations, chemical applications, livestock handling, transportation, and farm-based recreation. Prerequisites: Junior or instructor approval.

AMC 425 - Housing and Home Improvement

Hours: 3

This course addresses contemporary issues relevant to residential family housing and home improvement.

AMC 426 - Agri Power & Energy Management

Hours: 3

A study of the principles and theories needed to comprehend and manage agricultural and environmental technology associated with machinery/equipment and energy systems. Reduction and synthesis of natural and applied science principles which involve mechanical, electrical, chemical power systems; the adjustments, fabrication, maintenance, repair and man agreement of machines and equipment utilized in said systems; knowledge of entrepreneurship, client relations, communications, economics, safety, service, planning, and regulation of technologies associated with agriculture and the environment.

AMC 428 - Laboratory Management in Agricultural Mechanization

Hours: 3

Principles and techniques for planning, organizing, and supervising instructional activities in agricultural mechanization. Topics include lab safety, inventory control, equipment selection, skill development, and assessment methods.

AMC 489 - Independent Study

Hours: 1-4

Independent Study. One to four semester hours. Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisite: Consent of department head.

AMC 497 - Special Topics

Hours: 1-4

Special Topics. One to four semester hours. Organized class. May be repeated when topics vary.

ANS 1119 - Introduction to Animal Science Laboratory

Hours: 1

(AGRI 1119) Laboratory in the preliminary study of the selection, reproduction, nutrition and management of beef and dairy cattle, swine, small ruminants, horses and poultry.

ANS 1319 - Introduction to Animal Science

Hours: 3

(AGRI 1319) Study of the selection, reproduction, nutrition and marketing of beef and dairy cattle, small ruminants, swine, horses and poultry.

ANS 2319 - Livestock Handling and Presentation

Hours: 3

Students will be engaged in active experiential learning in all aspects of handling, training, fitting and presenting livestock in meat animal production systems. Included in the content will be selection, feeding, clipping, and stock show preparation.

ANS 2321 - Livestock Selection & Evaluation

Hours: 3

(AGRI 2321) Three semester hours (1 lec / 4 lab) Selection and evaluation of breeding and market animals, breed characteristics, and carcass evaluation as it relates to live animal evaluation. Prerequisites: ANS 1319 or concurrent enrollment and ANS 1119 or concurrent enrollment.

ANS 297 - Special Topics

Hours: 1-4

Organized class. May be repeated when topics vary.

ANS 300 - Pre-Junior Livestock Judging Team

Hours: 2

Beginning livestock judging training, including evaluation, selection, and oral reasons, for students that will compete on the Texas A&M University-Commerce Livestock Judging Team the following Spring. Class will also meet outside of the scheduled time. Prerequisites: ANS 2321 (Livestock Evaluation and Selection) with a minimum grade of C.

ANS 301 - Junior Livestock Judging Team

Hours: 2

Competitive Livestock Judging Team representing Texas A&M University-Commerce at intercollegiate livestock judging contests in the Spring Semester. Students will receive extensive training in livestock evaluation, selection, and oral reasons. Team practices, travel, and contests will also occur outside of regularly scheduled class periods. Prerequisites: ANS 300 (Pre-Junior Livestock Judging Team), with a minimum grade of C.

ANS 307 - Animal Feeds and Feeding

Hours: 3

Three semester hours (2 lec / 2 lab) Chemical composition of feedstuffs, requirements of domestic animals, utilization of nutrients, formulating and balancing rations. Prerequisites: ANS 1319, ANS 308, and MATH 1314.

ANS 308 - Animal Nutrition

Hours: 3

Functions of carbohydrates, proteins, vitamins, lipids, minerals and water. Chemistry and physiology of digestion, absorption, and metabolism of nutrients and their metabolites in animals. Prerequisites: ANS 1319, CHEM 1305 or CHEM 1311, and BSC 1406.

ANS 309 - Animal Breeding

Hours: 3

Genetic evaluation and estimation of breeding values. Selection and the use mating systems including the use of inbreeding, crossbreeding, and other mating plans. Prerequisites: MATH 1314 and ANS 1319.

ANS 310 - Animal Genetics

Hours: 3

An introduction to molecular genetics including Mendelian and population genetics, replication, transcription, and translation. Gene expression and regulation. Use of current genomic methodologies including genotyping and transgenics in animal agriculture. Prerequisites: ANS 1319 or BSC 1407 and CHEM 1311.

ANS 311 - Reproductive Physiology of Domestic Animals

Hours: 3

Three semester hours (2 lec / 2 lab) Comparative anatomy and physiology of the male and female reproductive systems of domestic animals, endocrinology of reproduction, gestation and parturition. Prerequisites: ANS 1319, BSC 1406, CHEM 1311.

ANS 312 - Artificial Breeding of Domestic Animals

Hours: 3

Three semester hours (2 lec / 2 lab) Principles of artificial breeding of farm animals. Semen collection and evaluation, gamete freezing and storage, reproduction management techniques and pregnancy diagnosis. Prerequisites: ANS 311.

ANS 313 - Dairy Cattle Management

Hours: 3

Dairy breeds and their selection, milk secretion, composition and handling, milking equipment and facilities. Prerequisites: ANS 1319.

ANS 314 - Comparative Vertebrate Physiology

Hours: 3

The course is a comparative study of basic physiological principles and functional organization with emphasis on the functioning of organ systems in various vertebrate classes and their adaptation to the environment leading to an understanding of evolutionary relationships. The course evaluates i) the mechanisms by which animals perform their life-sustaining functions, ii) the ways in which diverse phylogenetic groups of animals both resemble each other and differ, iii) the ways in which physiology and ecology interact, and iv) the importance of all levels of organization, from genes to proteins and tissues to organs, for the full understanding of physiological systems. Cross listed with BSC 314

ANS 317 - Livestock Management Techniques

Hours: 3

Three semester hours (2 lec / 2 lab) Application of animal handling and management techniques for dairy, beef, sheep, swine and poultry. Prerequisites: ANS 1319 and ANS 1119.

ANS 319 - Anatomy and Physiology of Domestic Animals

Hours: 3

Structure and function of organ systems with special reference to domestic animals. Prerequisites: ANS 1319 and BSC 1406.

ANS 320 - Anatomy and Physiology of Domestic Animals Laboratory

Hours: 1

Laboratory systematic study of the gross and microscopic anatomy and physiology of domestic animals. NOTE: Dissection of animal cadavers will be required of all students. Prerequisites: ANS 1319.

ANS 389 - Independent Study

Hours: 0-4

Independent Study. One to four semester hours. Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisite: Consent of department head.

ANS 397 - Special Topics

Hours: 0-4

Organized class. May be repeated when topics vary.

ANS 401 - Senior Livestock Judging Team

Hours: 2

Students will represent Texas A&M University-Commerce in intercollegiate livestock judging contests in the Fall Semester (finishing their collegiate livestock judging eligibility). Students will receive advanced training in livestock evaluation, selection, and oral reasons. Team practice, travel, and contests will also occur outside of scheduled class times. Prerequisites: ANS 301 (Junior Livestock Judging Team), with a minimum grade of B.

ANS 409 - Ultrasound Techniques

Hours: 3

Three semester hours (2 lec / 2 lab) Ultrasound Techniques for Body Composition in Livestock. Basic knowledge and techniques of real-time ultrasound to measure body composition in livestock. Prerequisites: ANS 1319.

ANS 411 - Sheep and Goat Management

Hours: 3

Three semester hours (2 lec / 2 lab) Types, breeds and usefulness of sheep and goats in the U.S. Management systems, production schemes, and general husbandry. Prerequisites: ANS 1319.

ANS 412 - Beef Cattle Management

Hours: 3

Three semester hours (2 lec / 2 lab) Concepts and principles of breeding, feeding and management of beef cattle in the U.S. A survey of the past, present and future ideas of the beef cattle industry. Prerequisites: ANS 1319.

ANS 413 - Swine Management

Hours: 3

Three semester hours (2 lec / 2 lab) Commercial and purebred swine operations. Feeding, breeding, and management practices, production efficiency and waste management facilities. Prerequisites: ANS 1319.

ANS 415 - Companion Animal Management

Hours: 3

Anatomy, physiology, nutrition, genetics and health of companion animals including cats, dogs, rabbits, rats, mice, reptiles, amphibians and fish. Problem solving and enterprise management. Prerequisites: ANS 1319 and junior standing.

ANS 417 - Domestic Animal Behavior and Welfare

Hours: 3

Investigation into the evolution and etiology of common and uncommon domestic animal behaviors. In conjunction to common behaviors and production practices the ethical treatment and management of domestic animals from the welfare perspective will be covered; including evolution, regulations, legislation on a global scale. Prerequisites: ANS 219 or ANS 319. Crosslisted with: ANS 517.

ANS 419 - Diseases and Parasites of Livestock

Hours: 3

A study of the control and prevention of common infectious and non-infectious diseases of livestock. The common parasites, their prevention, and control. Prerequisites: ANS 1319 and BSC 1406.

ANS 489 - Independent Study

Hours: 1-4

Independent Study. One to four semester hours. Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisite: Consent of department head.

ANS 490 - H Honors Thesis

Hours: 3

Honors Thesis - Three semester hours

ANS 491 - H Honor Reading

Hours: 3

Honors Readings in Animal Science. Three semester hours.

ANS 497 - Special Topics

Hours: 0-4

Special Topics. One to four semester hours. Organized class. May be repeated when topics vary.

EQSC 2321 - Horse Evaluation

Hours: 3

(AGRI 2321) Three semester hours (2 lecture, 2 lab). Introduction to horse judging. Establishes the critical and analytical thinking skills, judgment, and written and oral communication skills in preparation for horse judging in competitive settings.

EQSC 140 - Introduction to Horsemanship and Equitation

Hours: 3

Three semester hours (2 lec / 2 lab) Introduction to horse handling and equitation including grooming, saddling, bridling, horse care and basic riding techniques (English and Western). Emphasis on practical work and confidence building for students with little or no horse experience.

EQSC 220 - Intermediate Horsemanship and Equitation

Hours: 3

Three semester hours (2 lec / 2 lab) This course focuses on the refinement of the skills of western riders with some previous experience. The emphasis is on training or conditioning of older horses, and understanding equine behavior as it relates to riding and training horses. Prerequisites: EQSC 140 or instructor approval.

EQSC 240 - Introduction to Equine Science

Hours: 3

Three semester hours (2 lec / 2 lab) Introduction to structure and function of the horse, equine management, nutrition, conformation, biomechanics, reproduction and health. Overview of the equine industry and career choices.

EQSC 241 - Advanced Horsemanship

Hours: 3

Three semester hours (2 lec / 2 lab) Refinement of equitation and horse training principles for various disciplines. Prerequisites: EQSC 240, EQSC 345.

EQSC 297 - Special Topics

Hours: 1-4

Organized class. May be repeated when topics vary. Prerequisites: Consent of department head.

EQSC 321 - Equine Genetics and Mating Selection

Hours: 3

Principles of genetics, and application of breeding selection with emphasis on the horse. Study of genetic disorders, inheritance, and genetic improvement of horses. Prerequisites: ANS 118 or EQSC 240.

EQSC 322 - Equine Exercise Physiology

Hours: 3

Fundamentals of evidence-based equine training and exercise methods. Discussion of training programs, their assessment and effectiveness, and prevention of exercise-induced injuries. Prerequisites: ANS 1319 or EQSC 240, and EQSC 323.

EQSC 323 - Equine Anatomy and Physiology

Hours: 3

Equine structure and function with emphasis on the nervous, respiratory, digestive, cardiovascular and musculoskeletal systems.

EQSC 325 - Advanced Horse Evaluation

Hours: 3

Three semester hours (2 lec / 2 lab) Course emphasis is on equine evaluation in competition with refinement of decision making and public speaking skills. Travel to horse competitions is required. Prerequisites: EQSC 225.

EQSC 335 - Stock Horse Equitation

Hours: 3

Three semester hours (2 lec / 2 lab) This course focuses on the training and showing of horse in collegiate stock horse competition. Prerequisites: Instructor approval.

EQSC 340 - Equine Marketing and Sale Fitting

Hours: 3

Three semester hours (2 lec / 2 lab) This class is designed to help students learn the objectives for training yearling colts. The students will do ground work with the horses that is beyond halter breaking the colts. The students will work on getting horses ready for the many aspects involved in being saddle horses. The students will learn how to teach the colts to walk, trot, and lope in both directions on a longe line, load into a trailer on their own, listen to verbal commands, come up to people in the pasture for catching, stand correctly and still for purposes of show, general obedience, and future farrier needs, as well as many other aspects of training a young horse.

EQSC 341 - 2-Yr-Old Horse Training

Hours: 3

Three semester hours (2 lec / 2 lab) Habituation of the young horse to tack and work under saddle. Prerequisites: EQSC 240, EQSC 241, EQSC 345.

EQSC 342 - Equine Nutrition

Hours: 3

Nutrition of the horse according to stage of development, use and training. Discussion of ration formulation, feeding practice and digestive disorders. Prerequisites: ANS 1319 or EQSC 240.

EQSC 343 - Equine Reproduction

Hours: 3

Anatomy and physiology of the mare and stallion including lactation, endocrinology, parturition, semen quality and behavior. Management of broodmares, stallions and foals. Prerequisites: ANS 1319 or EQSC 240.

EQSC 345 - Equine Training

Hours: 3

Three semester hours (2 lec / 2 lab) Introduction to equine perception, behavior, memory and learning. Behavior analysis in young and adult horses and application of evidence-based training principles. Introduction of corrective methods to discourage unwanted behaviors and enforce the desired behaviors. Prerequisites: EQSC 220 or instructor approval.

EQSC 346 - Equine Reproductive Techniques

Hours: 3

Three semester hours (2 lec / 2 lab) Introduction to routine reproductive techniques such as estrus detection, semen management, breeding techniques, artificial insemination, sonographic pregnancy diagnosis, and introduction to reproductive health management. Emphasis is on stallion, mare and foal examination and application of veterinary techniques related to equine reproduction. Prerequisites: ANS 1319 or EQSC 240, EQSC 343.

EQSC 350 - Equine Sales & Marketing

Hours: 3

Three semester hours (2 lec / 2 lab) This course involves discussions of the economic, structural, cultural, and political factors impacting marketing functions in equine business enterprises. Advertising and promotions for sale horses, determining prices for horses, breeding fees, how to analyze pedigrees and black type pedigrees, as well as the application of market research design and methodology in establishing equine sales related businesses. Students will also learn how to fit and prepare a young horses for sale. Prerequisites: EQSC 240 or ANS 1319.

EQSC 355 - Equine Industry Tour

Hours: 3

Three semester hours (2 lec / 2 lab) Tours of breeding, training, and competition facilities that are of importance to the equine industry. An additional course fee may be assessed to cover travel, and lodging arrangements. The student will be required to pay this course fee in advance of departure for the tour. Scholarship funds may not cover the additional expense of this course. Student will be responsible for own meals and extras. Prerequisites: EQSC 240.

EQSC 389 - Independent Study

Hours: 0-4

Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisites: Consent of department head.

EQSC 441 - Stable Management

Hours: 3

Horse and barn management principles for breeding, training or boarding facilities including horse and client safety, preventative health care, record keeping, emergency care, facility and manure management, feed and supply management, equine law and customer relations. Prerequisites: EQSC 240.

EQSC 443 - Equine Enterprise Management

Hours: 3

Application of economic principles to the equine industry in order to develop a profitable equine business. Discussion of strategies to develop a business idea or a starter business, as well as adequate pricing and marketing of equine services. Prerequisites: ANS 118 or EQSC 240.

EQSC 489 - Independent Study

Hours: 1-4

Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisites: Consent of department head.

EQSC 490 - H Honors Thesis

Hours: 3

Honors Thesis. Three semester hours.

EQSC 491 - H Ind Honors Readings

Hours: 3

Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member.

EQSC 497 - Special Topics

Hours: 0-4

Special Topic

FDSC 1329 - Principles of Food Science

Hours: 3

(AGRI 1329) Three semester hours (2 lecture, 2 lab). Basic principles of food preservation in relation to processing techniques and quality control procedures. Processing effects on aesthetic and nutritional food quality of plant and animal products will be explored. Field trips to food processing companies will be required.

FDSC 318 - Meat Technology

Hours: 3

Three semester hours (2 lecture, 2 lab). Theory and practice of slaughtering, processing, curing, and storing meat from domestic animals. Wholesale and retail cuts. Prerequisites: ANS 1119, ANS 1319.

FDSC 421 - Food Systems: Farm to Fork

Hours: 3

This course will introduce students to the concept of food systems at the local, regional, and global levels. Students will examine and reflect on critical issues influencing food production, processing, distribution, and consumption. Prerequisites: Junior standing.

FDSC 489 - Independent Study

Hours: 0-4

Independent Study. One to four semester hours. Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisite: Consent of department head.

FDSC 497 - Special Topics

Hours: 1-4

Special Topics. One to four semester hours. Organized class. May be repeated when topics vary.

PLS 1107 - Introduction to Plant Science Lab

Hours: 1

(AGRI 1107) Course will provide students with hands-on exercises in the lab, greenhouse, and field. Students will grow agronomic and vegetable crops, separate plants into their morphological components, prepare and view cross sections of leaves and stems, alter light sources, test different soil fertility treatments, administer water stress and measure plant water relations, emasculate blooms, alter environmental conditions to promote flowering, quantify yield components, and examine genetic variability.

PLS 1115 - Introduction to Horticulture Laboratory

Hours: 1

(AGRI 1115) Introduction to the techniques and science for the growth and propagation of horticultural plants, including identification, propagation, fertilization, and pruning.

PLS 1307 - Introduction to Plant Science

Hours: 3

(AGRI 1307) An introduction to the principles of plant growth, general crop production, and ornamental and production horticulture.

PLS 1315 - Introduction to Horticulture

Hours: 3

(AGRI 1315) Introduction to the science and art of modern horticultural plant production and growth, including propagation, fertilization, pest control, and pruning; major groups of garden crops including vegetables, fruits and nuts, ornamentals, houseplants, and florist crops. Lab includes propagation and culture of garden plants in field and greenhouse.

PLS 2313 - Economic Entomology

Hours: 3

(AGRI 2313) Three semester hours (2 lecture, 2 lab). This course introduces students to the major orders of insects and other arthropods of economic importance with specific emphasis on those beneficial and harmful to agricultural and horticultural crops, livestock, pets, and food products. Control techniques using Integrated Pest Management will be included.

PLS 230 - Ornamental Plant Identification

Hours: 3

Three semester hours (2 lec / 2 lab) Ornamental trees, shrubs, vines, and garden annuals and perennials. Their identification, nomenclature, classification, cultural requirements and landscape uses.

PLS 297 - Special Topics

Hours: 1-4

Organized class. May be repeated when topics vary.

PLS 303 - Introduction to Floral Design

Hours: 3

Three semester hours (2 lec / 2 lab) Introduction to the history and uses of floral art in society. Principles and elements of design will be discussed and demonstrated using floral materials.

PLS 305 - Landscape Design

Hours: 3

Design of residential and commercial landscapes. The student will learn basic design concepts and themes, be able to create landscape plans, and will be able to provide a cost estimate for the design. Prerequisites: PLS 230 or instructor approval.

PLS 306 - Plant Propagation

Hours: 3

Three semester hours (2 lec / 2 lab) This course provides an introduction to sexual and asexual plant propagation. The student will learn the skills and techniques to successfully propagate plants from seeds and other vegetative structures. Prerequisites: PLS 1315 or PLS 1307.

PLS 309 - Soil Science

Hours: 3

Origin, formation, fertility and management of soils. Prerequisites: PIS 115 or 1415, and Chem 1405 or 1411.

PLS 320 - Soil Fert-Plant Nutrition

Hours: 3

Soil Fertility and Plant Nutrition. Three semester hours. Elements required for plant nutrition and their effects on plant growth. Principles of uptake, transport and assimilation. Prerequisite: PLS 309.

PLS 323 - Field Crops

Hours: 3

Field Crops. Three semester hours (2 lecture, 2 lab). Principles of agronomic crop production practices. Major field crops and management techniques will be studied. Prerequisite: PIS 115

PLS 324 - World Herbs and Vegetables

Hours: 3

A comprehensive overview of major and minor vegetable crops and culinary herbs grown around the world, U.S., and Texas in terms of center of origin, history, classification, economic importance and marketing patterns, nutritional value, physiological growth and development patterns, and commercial production practices. Prerequisites: PLS1307 Introduction to Plant Science or PLS 1315 Introduction to Horticulture.

PLS 326 - Forage and Pasture Crops

Hours: 3

Three semester hours (2 lec / 2 lab) The production, harvesting, storage, and uses of forage crops, hay and pasture crops, improvements, care and management of pastures given special emphasis. Practice work includes identification of seeds and plants, judging of hay, and field and pasture observation. Prerequisites: PLS 115, PLS 309.

PLS 327 - Hydroponic Crop Production

Hours: 3

Three semester hours (2 lec / 2 lab) Principles of hydroponic production systems, including types of system, nutrient solution preparation and management, crop response to aerial environmental factors and their manipulation, new technologies inherent to controlled environment agriculture (plant factories, vertical farming). Hands-on experience with the practice of hydroponic production of major vegetables (leafy greens, culinary herbs, and vine crops). Prerequisites: PLS 324 World Herbs and Vegetables.

PLS 329 - Soil Science Laboratory

Hours: 1

Students will explore laboratory techniques to determine soil physical and chemical properties that are related to plant growth. Prerequisites: PIS 115 or 1415, and Chem 1405 or 1411.

PLS 355 - Interior Landscaping

Hours: 3

Three semester hours (2 lec / 2 lab) This course provides an introduction into interior landscapes. The course will include identification, selection, installation, maintenance, and management of plants used in interior landscapes.

PLS 381 - Crop Physiology

Hours: 3

Physiological processes underlying crop management practices and their alternatives. Prerequisites: Chem 1407, PIS 115 or PLS 1415.

PLS 397 - Special Topics

Hours: 1-4

PLS 420 - Crop Production Practicum

Hours: 3

Crop Production Practicum. Three semester hours (1 lecture, 4 lab). Study of crop production practices in this area by actually planting, growing, harvesting, and marketing a crop: (a) Wheat or Oats; (b) Corn; (c) Grain Sorghum; (d) Cotton. A report, including costs and returns, will be due upon completion of the project. Course may be repeated when subject varies, up to a maximum of 9 hours. Prerequisite: PIS 115.

PLS 430 - Greenhouse Management

Hours: 3

Three semester hours (2 lec / 2 lab) This course covers greenhouse structures and equipment needed for successful plant production in a greenhouse. The student will learn about greenhouse construction, production, and management as a business venture. Prerequisites: PLS 1315 or 1307.

PLS 434 - Weed Control

Hours: 3

Three semester hours (2 lec / 2 lab) An introduction to the principles of weeds, weed control, and herbicides.

PLS 450 - Landscape Management

Hours: 3

Three semester hours (2 lec / 2 lab) This course covers information related to the management of landscapes on residential and commercial properties. Topics will include items related to effective installation and maintenance of landscape properties, including financial and personnel aspects of managing a landscape business. Prerequisites: PLS 1315 or instructor approval.

PLS 455 - Turfgrass Management

Hours: 3

Three semester hours (2 lec / 2 lab) Establishment and maintenance of turfgrasses in lawns, sports fields, and golf courses. Course will include selection, planting, fertilization, maintenance, and pest and disease control.

PLS 460 - Plant Taxonomy

Hours: 3

Three semester hours (2 lec / 2 lab) A systematic overview of the plant kingdom focusing on classification and identification of unknown specimens.

PLS 489 - Independent Study

Hours: 1-4

Independent Study. One to four semester hours. Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. May be repeated when the topic varies. Prerequisite: Consent of department head.

PLS 490 - Independent Study

Hours: 3

PLS 491 - H Ind Honors Readings

Hours: 3

PLS 497 - Special Topics

Hours: 0-4

Special Topics. One to four semester hours. Organized class. May be repeated when topics vary.