

# Department of Agriculture, Agribusiness and Environmental Sciences

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## Contact Information

**Chair:** Dr. Venugopal Mendu

**Phone:** 361-593-3722

**Email:** venugopal.mendu@tamuk.edu

**Building Name:** Kleberg Agriculture Building

**Room Number:** 117

The purpose of the graduate program in the Department of Agriculture, Agribusiness and Environmental Sciences is to provide students with a solid foundation in agricultural and natural resource sciences, theory and management. Goals of the department include developing new ideas through research, training graduate students in creativity and freedom of thought and preparing students for success in the face of a rapidly evolving economy.

There are three (3) Master of Science degree majors within the Department: Agriculture Science (AGSC), Environmental Systems Management (ENVS), and Plant & Soil Science (PLSS). Each of these majors has 3 M.S. track plan options (Plan I-thesis; Plan II-grad project; Plan III- coursework only). All Plan I thesis degrees require a total of 30 hours, with 18 hours in major; whereas Plan II and Plan III degree options require a total of 36 hours with 24 hours in the major subject area.

For a M.S. in Agriculture Science (AGSC), Plant Sciences (PLSS) or Environmental Science (ENVS), 36 hour Graduate Program and Course Only options, a combination of 24 hours in major subject areas (AGRI, AGSC, AGBU, PLSS, ENVS). Any course within the Department of Agriculture, Agribusiness, and Environmental Sciences will satisfy the required 24 major hours minimum expectation for a general AGSC degree towards the 36 hours program option.

Research thesis must be prepared under the direction of a professor in the major subject area who is the student's thesis adviser. A thesis proposal approved by the thesis adviser must be completed for a letter grade (A, B, C) to be assigned in the first 3 hours of Thesis Research 5306. The student must submit the Thesis Proposal Defense form and the abstract page to the College of Graduate Studies.

Thesis 5306 is used solely by 'Thesis Option' students. The thesis requires 6 semester credit hours of grades, the first 3 semester credit hours consisting of a proposal plan preparation and the last 3 semester credit hours consisting of a final thesis. The students should be enrolled in 5306 during semesters or summer terms when the student is receiving supervision from the thesis adviser, thesis committee or is receiving a research stipend.

## Agribusiness (AGBU)

### **AGBU 5305** Graduate Research Project **3 SCH (3)**

Designed for project option students and requires completion of research project. Prerequisite: departmental approval. May be repeated for a maximum of 6 semester hours.

### **AGBU 5306** Thesis **3 SCH (3)**

Designed for thesis option students. The course requires completion of thesis research. Prerequisite: departmental approval. May be repeated for maximum of 6 semester hours.

### **AGBU 5307** Quant/Qual Analy for Agribus **3 SCH (3-0)**

This course introduces quantitative approaches for evidence-based decision-making in agribusiness management. Topics include data analysis, model formulation, and forecasting techniques applied to production, marketing, and financial decisions. Students will develop analytical and interpretive skills to translate quantitative findings into actionable managerial strategies.

### **AGBU 5325** Adv Rangeland Resource Econ **3 SCH (3-0-0)**

The course provides basic understanding of economics, management, and planning related to the ranching industry, range livestock and natural resources management issues. Additionally, policy and management considerations are considered and discussed from both private land and public land perspectives, and analyses of benefits and trade-offs are made from single- and multi-species contexts. The course includes some theoretical bases to understand the economic principles underpinning effective natural resource management.

### **AGBU 5340** Agribusiness Leadership **3 SCH (3-0-0)**

Survey of contemporary theories of leadership organizational change with specific focus and application to business structures common in agribusiness industries (e.g., sole proprietors, limited partnerships, cooperatives). Students will be exposed to emergent leadership challenges, paired with an industry mentor, to build skills through experiential/service-learning opportunities with agribusiness industry leaders.

### **AGBU 5355** Advcd Food & Agric Market Anal **3 SCH (3-0-0)**

This course explores the fundamentals of commodity and food market research with application for agribusiness planning and marketing. Students learn to define research problems, collect and analyze data, and interpret findings to solve marketing challenges related to commodity and food systems. Emphasis is placed on both practical application and understanding the research process.

**AGBU 5360** Agribus Risk & Financial Mgmt **3 SCH (3-0-0)**

Advanced financial management principles applied to agribusiness firms. Emphasis is placed on capital budgeting under risk and uncertainty, financial analysis, and the use of production and financial risk management tools. The course integrates quantitative analysis with practical consulting projects in collaboration with agribusiness firms to strengthen decision-making and risk management skills.

**AGBU 5380** Economics of Agribus Strategy **3 SCH (3-0-0)**

This course applies economic models and strategic decision-making tools to inform business decisions, develop competitive strategies, and evaluate resource allocation problems related to real-world challenges in the agribusiness sector. Emphasis is placed on agribusiness case studies to integrate economic, strategic, and systems thinking to support effective decision-making in agricultural and food industries.

**AGBU 5390** Advanced Studies In Agribus **3 SCH (3)**

Material offered is determined by the needs of the students. Laboratory and lecture vary according to the subject needs. May be repeated once under a different topic.

**AGBU 5395** Advance Problems in Agribus **1-3 SCH (1-3)**

Independent work which may include a laboratory or field problem. Variable credit dependent upon the problem; may be repeated for a total of 3 semester hours for thesis option students or 6 semester hours for project option and course-only option students. Prerequisite: approval of a faculty member who will supervise the problem.

## Agriculture Science (AGSC)

**AGSC 5305** Graduate Research Project **3 SCH (3)**

Designed for project option students and requires completion of research project. Prerequisite: departmental approval. May be repeated for a maximum of 6 semester hours.

**AGSC 5306** Thesis **3 SCH (3)**

Designed for thesis option students. The course requires completion of thesis research. Prerequisite: departmental approval. May be repeated for maximum of 6 semester hours.

**AGSC 5312** Facilities for Agric Sci **3 SCH (3)**

Planning and designing agricultural facilities for the secondary school with consideration for educational needs, curriculum, efficiency of use, inventory control and management. Organizing, equipping, maintaining and operating the shop, greenhouse, farm and meat processing laboratories.

**AGSC 5361** Prog Building in Agric Educ **3 SCH (3)**

Organization of education programs in vocational agriculture for production, cooperative training and pre-employment classes. Developing annual teaching plan.

**AGSC 5363** Mthds in Adult and Yng Farmer **3 SCH (3)**

Determining needs, methods of establishing programs, evaluating programs and methods of teaching producers involved in agriculture. A detailed study of adult and young farmer program.

**AGSC 5367** Org and Admin of Voc Educ **3 SCH (3)**

Theories and procedures applicable to vocational education in the areas of program standards, finances, state plan, facilities, recruitment and selection of personnel and role of community advisory committees as applied to vocational education.

**AGSC 5390** Advanced Studies in Agr Ed **3 SCH (3)**

Material offered will be determined by the needs of the students. May be repeated once under a different topic. Topics include the following: supervision of occupational experience programs in agriculture, agricultural youth leadership, instructional technology in agriculture and current issues in agricultural education.

**AGSC 5395** Advanced Prob in Agr Sci Tech **1-3 SCH (1-3)**

Independent work which may include a laboratory or field problem. Variable credit dependent upon the problem; may be repeated for a total of 3 semester hours for thesis option students or 6 semester hours for project option and course-only option students. Prerequisite: approval of a faculty member who will supervise the problem.

**AGSC 5399** Thesis Topics **1-9 SCH (1-9)**

For thesis option Master's students. To be taken by students who receive a stipend while working on their research project in Plant and Soil Science. Designed to be student-specific to meet each student's individual needs and to enhance their graduate education by providing one-on-one time with professors.

## Environmental Science (ENVS)

**ENVS 5300** Adv. Environmental Science **3 SCH (3-0)**

In-depth exploration of the fundamental principles of environmental systems including biological, chemical, social, political, cultural, and economic factors that affect the environment; scientific and social implications of climate change, including impact of anthropogenic pollutants and human population on the environment.

**ENVS 5305** Graduate Research Project **3 SCH (3-0)**

Designed for project option students and requires completion of a research project. Prerequisite: departmental approval. May be repeated for a maximum of 6 semester hours.

**ENVS 5306 Thesis 3 SCH (3-0)**

Designed for thesis option students; the course requires 6 hours of grades, 3 hours will consist of completion of thesis proposal and 3 hours will consist of thesis. Completion of the thesis proposal must occur as a prerequisite to, or be enrolled in during the same semester as the 3 hours of thesis.

**ENVS 5310 Sustainable Landuse Dec & Mgmt 3 SCH (3-0)**

Impact of private and public land use on natural resource conservation; private land ownership and management issues; and land administration patterns in the United States. Registration in ENVS 5300 Advances in Environmental Science is required.

**ENVS 5320 North America Wetlands 3 SCH (3-0)**

Impact of anthropogenic activities on inland and coastal wetland ecosystems; the effects of altered wetland habitats on plant and animals communities. Registration in ENVS 5300 is required.

**ENVS 5330 Sustainability of Eviron Ecosy 3 SCH (3-0)**

Importance of terrestrial ecosystems as habitats for environmental sustainability of plants, forests, and animal communities. Prerequisites: ENVR Intro to Environmental Science. Students can enroll concurrently with Introduction to Environmental Science. ENVS 5300 is required.

**ENVS 5340 Soil and Water Conservation 3 SCH (3-0)**

Students will learn the methods of soil and water conservation and management techniques adapted to conserve water and soils in different environments. Students will also study relevant literature for most recent developments in the field of water and soil conservation.

**ENVS 5350 Experimental Design 3 SCH (3)**

This course will introduce students to experimental designs and application of designs used in environmental and agricultural sciences; develop understanding of statistical treatment of data and use of statistics to interpret and communicate research data; provide hands-on training on SAS software, and prepare students to real life data collection and analysis.

**ENVS 5390 Adv Studies in Environment Sci 3 SCH (3-0)**

Material offered is determined by the needs of the students. May be repeated under a different topic.

**ENVS 5395 Adv Probs in Environmental Sci 1-3 SCH (1-3-0)**

Independent work that may include a laboratory or field problem. Variable credit dependent upon the problem; may be repeated for a total of 3 semester hours for thesis option students or 6 semester hours for project option and course-only students. Prerequisite: approval of a faculty member who will supervise the problem.

**ENVS 5399 Thesis Topic 1-9 SCH (0-1-9)**

For thesis option Master's students. To be taken by students who receive a stipend while working on their research project in Environmental Systems Management. Course is designed to be student-specific to meet each student's individual needs and to enhance their graduate education by providing one-on-one time with professors.

## Plant and Soil Science (PLSS)

**PLSS 5305 Graduate Research Project 3 SCH (3)**

Designed for project option students and requires completion of research project. Prerequisite: departmental approval. May be repeated for a maximum of 6 semester hours.

**PLSS 5306 Thesis 3 SCH (3)**

Designed for thesis option students. The course requires completion of thesis research. Prerequisite: departmental approval. May be repeated for maximum of 6 semester hours.

**PLSS 5337 Prac App Plant Biotechnology 3 SCH (3-0)**

The course will include an introduction to theoretical aspects in Plant Biotechnology with emphasis on practical application. Students will have an opportunity to get hands on training with some of the most basic, yet widely utilized techniques in micropropagation and plant molecular diagnostics.

**PLSS 5350 Pesticides and the Environment 3 SCH (3-0)**

Comprehensive in-depth study of characteristics and properties of pesticides and their applications in agricultural sciences, public and environmental health. Emphasis on insecticides, miticides (i.e., acaricides), fungicides and herbicides. Elements of pesticide science, such as pesticide chemical formulations, biochemical pathways of pesticide effects on organisms and the physiology of toxicity on development will be covered.

**PLSS 5351 Advanced Plant Propagation 3 SCH (3-0)**

Emphasis is placed on the basic principles of plant propagation to provide an adequate background in the areas of horticulture. All aspects of plant propagation will be studied including methods and technologies that are used in the propagation industry.

**PLSS 5352 Advanced Plant Physiology 3 SCH (3-0)**

Introduction to physiological processes of plants including physical processes, water relations, and cell physiology. In-depth examination of plant cell structures, photosynthetic processes, transport and translocation of water and solutes with the plant, biochemistry and metabolism, and growth and development of plants.

**PLSS 5353 Advanced Plant Pathology 3 SCH (3-0)**

Advanced study of the biology of plant pathogenic fungi, oomycetes, bacteria and viruses as well as the plant response to pathogen attack. Topics include host recognition and colonization, pathogenicity and virulence determinants, resistance mechanisms and plant defense responses. This course will also cover management practices to minimize the damage associated with plant diseases.

**PLSS 5354 Sustainable Agroecosystems 3 SCH (3-0)**

This course examines the fundamentals of sustainable agriculture, sustainable water management, food safety, soil health, as well as challenges associated with emerging contaminants, including micro-nano-plastics (MNPs), in agroecosystems. Analysis of the roles of MNPs as carriers of contaminants, and the sustainable practices to reduce the impact of agriculture on the environment will be discussed.

**PLSS 5360 Exper. Designs & Data Analysis 3 SCH (3-0)**

Introduction to experimental design including data analysis software, and data interpretation. Hands-on training on SAS software and preparation of data collection and analysis.

**PLSS 5390 Special Topics Plant Soil Sci 3 SCH (3-0)**

Material offered to be determined by the needs of the students. Lecture will vary according to the subject needs with each course having three hour credit. May be repeated for credit when the topic changes.

**PLSS 5395 Adv Prob in Plant Science 1-3 SCH (1-3)**

Independent work that may include a laboratory or field problem. Variable credit dependent upon the problem; may be repeated for a total of 3 semester hours for thesis option students or 6 semester hours for project option and course-only option students. Prerequisite: approval of a faculty member who will supervise the problem.

**PLSS 5399 Thesis Topics 1-9 SCH (1-9)**

For thesis option Master's students. This course is to be taken by students who receive a stipend while working on their research project in Plant and Soil Science. Course is designed to be student-specific to meet each student's individual needs and to enhance their graduate education by providing one-on-one time with professors.

## Graduate Programs

- Agribusiness, M.S.
- Agriculture Science, M.S.
- Environmental Systems Management, M.S.
- Plant and Soil Science, M.S.

## Planned Course Offerings

This section provides a comprehensive list of courses offered by the Department of Agriculture, Agribusiness and Environmental Science, along with a three-year schedule indicating when each course is expected to be available. Please note that course offerings and scheduling are subject to change based on faculty availability and student demand. It is recommended that students consult with their academic advisor to plan their course schedule accordingly.

### Agribusiness (AGBU)

| Course    | Fall 2026 | Spring 2027 | Fall 2027 | Spring 2028 |
|-----------|-----------|-------------|-----------|-------------|
| AGBU 5305 | X         |             | X         |             |
| AGBU 5306 | X         |             | X         |             |
| AGBU 5390 |           | X           |           | X           |

### Agriculture Science (AGSC)

| Course    | Fall 2026 | Spring 2027 | Fall 2027 | Spring 2028 |
|-----------|-----------|-------------|-----------|-------------|
| AGSC 5305 |           | X           |           | X           |
| AGSC 5306 |           | X           |           | X           |
| AGSC 5312 |           | X           |           | X           |
| AGSC 5361 |           | X           |           | X           |
| AGSC 5363 |           | X           |           | X           |
| AGSC 5367 | X         |             | X         |             |
| AGSC 5390 |           | X           |           | X           |
| AGSC 5395 |           | X           |           | X           |
| AGSC 5399 |           | X           |           | X           |

## Environmental Science (ENVS)

| Course    | Fall 2026 | Spring 2027 | Fall 2027 | Spring 2028 |
|-----------|-----------|-------------|-----------|-------------|
| ENVS 5300 | X         |             | X         |             |
| ENVS 5305 |           | X           |           | X           |
| ENVS 5306 |           | X           |           | X           |
| ENVS 5310 |           | X           |           | X           |
| ENVS 5320 | X         |             | X         |             |
| ENVS 5330 |           | X           | X         | X           |
| ENVS 5340 |           | X           |           | X           |
| ENVS 5350 |           | X           |           | X           |
| ENVS 5390 |           | X           |           | X           |
| ENVS 5395 |           | X           |           | X           |
| ENVS 5399 |           | X           |           | X           |

## Plant and Soil Science (PLSS)

| Course    | Fall 2026 | Spring 2027 | Fall 2027 | Spring 2028 |
|-----------|-----------|-------------|-----------|-------------|
| PLSS 5305 |           | X           |           | X           |
| PLSS 5306 |           | X           |           | X           |
| PLSS 5337 |           | X           |           | X           |
| PLSS 5350 |           | X           |           | X           |
| PLSS 5351 | X         |             |           |             |
| PLSS 5352 |           | X           |           | X           |
| PLSS 5353 |           |             | X         |             |
| PLSS 5354 |           | X           |           | X           |
| PLSS 5360 | X         | X           | X         | X           |
| PLSS 5390 | X         |             |           | X           |
| PLSS 5395 |           | X           |           | X           |
| PLSS 5399 |           | X           |           | X           |

## Marketable Skills

Texas A&M University-Kingsville is dedicated to equipping graduate and doctoral students with the advanced marketable skills necessary for professional and academic excellence beyond the university setting. These skills encompass a range of high-level interpersonal, analytical, and applied competencies that are sought after in today's competitive workforce.

Our graduate programs are structured to cultivate these capabilities through rigorous academic inquiry, experiential learning, faculty-mentored research, professional internships, and opportunities for scholarly and community engagement.

Below are the marketable skills cultivated through each of the department's graduate academic programs.

### Agriculture Science, M.S.

- Critical thinking and problem-solving skills
- Social responsibility
- Preparation to engage in life-long learning
- Master the depth of knowledge required for a degree

### Environmental Systems Management, M.S.

- Critical thinking and problem-solving skills
- Social responsibility
- Preparation to engage in life-long learning
- Master the depth of knowledge required for a degree

## **Plant and Soil Science, M.S.**

- Strategic thinking
- Systems thinking
- Business management
- Natural resource management
- Collaboration and teamwork