

# BIOSYSTEMS AND AGRICULTURAL ENGINEERING

The Department of Biosystems and Agricultural Engineering offers degrees within the Ferguson College of Agriculture and the College of Engineering, Architecture and Technology (CEAT). The department offers two undergraduate majors (Biosystems Engineering and Agricultural Systems Technology) and both masters and doctoral programs in biosystems engineering. The department's undergraduate and graduate biosystems engineering degrees are awarded through CEAT. The agricultural systems technology degree is awarded through the Ferguson College. The undergraduate biosystems engineering degree is accredited by the Engineering Accreditation Commission of ABET (see [www.abet.org](http://www.abet.org)) under criteria for biological engineering and similarly named programs.

Biosystems engineers and agricultural systems technology professionals create and adapt engineering knowledge and technologies for the efficient and effective production, processing, storage, handling and distribution of food, feed, fiber, and other biological products, while at the same time providing for a quality environment and preserving and protecting natural resources. Our graduates directly address problems and opportunities related to food, water, energy, and the environment—all of which are critical to the quality of life in our society and align with the mission of the Division of Agricultural Sciences and Natural Resources.

## Undergraduate Programs

The Biosystems Engineering undergraduate degree program is a comprehensive engineering program that includes math, physical and biological sciences, basic engineering science and specialty areas. The first two years focus on the underlying biological, physical, chemical, and mathematical principles of engineering, supplemented by appropriate general education courses in English, social sciences, and humanities. The next two years build systematically upon the scientific knowledge acquired in the early courses and students can focus in specific option areas. The coursework is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The program culminates in senior year design courses in which students integrate the analysis, synthesis, and other abilities they have developed throughout the earlier portions of their study into a capstone experience. Subject-matter specialization is provided through the following five undergraduate option areas: general, bioprocessing and food processing, environment and natural resources, machine systems and pre-medical.

The Biosystems Engineering undergraduate program verifies that our students possess core engineering knowledge and capability by requiring students to take the Fundamentals of Engineering exam, which is an important step toward becoming a professional engineer. Candidates for the BS degree in Biosystems Engineering must take the Fundamentals of Engineering exam prior to receiving their degree.

A wide variety of employment opportunities are available for biosystems engineers in industry, public service, and education. Opportunities include positions in government agencies, consulting engineering firms, biotechnology, and agricultural and food equipment industries.

The Agricultural Systems Technology degree program involves solving challenges faced in agricultural, food and natural systems using practical applications of available technologies and managerial skills. Those who

work in this area link engineering design with end-users, developing and implementing solutions that will have positive impacts on agriculture and environmental sustainability, use of equipment and products and agribusiness. Flexibility of interests in agricultural and natural systems, business management and life-long learning in an ever-changing technological world are emphasized in the curriculum.

Agricultural systems technology graduates are prepared for a variety of careers and industries in which technology interfaces with agricultural, food and natural systems. Potential career paths include agricultural and power equipment, manufacturing, equipment sales, food production and processing, government agencies, precision agriculture and environmental consulting, grain elevator management, production agriculture, petroleum industry, and water treatment operations.

In both undergraduate degree programs, an integral part of this education continuum—from basic science through comprehensive engineering design and technical problem solving—is learning experiences that facilitate the students' abilities to function effectively in both individual and team environments. Our programs provide every graduate with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational tools are introduced and used as a part of their problem-solving experiences. Finally, the students' experience in solving ever-more-challenging problems enables them to continue to learn independently throughout their professional careers.