Preparing Graduates for Lifetime Rewarding Careers

Agricultural and Biosystems Engineering

If you have an interest in any of the following, a career in agricultural and biosystems engineering may be right for you.

- developing a system to precisely locate a source of pollution
- improving the quality of life while protecting the environment
- using technology to solve problems facing our global ecosystem
- developing a biomass-to-energy conversion system
- preserving our natural resources of air, water, and soil
- converting raw materials and waste products into marketable products
- designing and testing new equipment
- aiding our own and developing countries with new techniques to protect the air, soil, and water
- developing systems to produce more food without endangering people and degrading the environment
- using mathematical, biological, and physical principles to take ideas and turn them into working reality
- designing efficient systems for tilling, planting, and harvesting feed, food, fiber, and fuel crops
- using electronic technology for quality control, packaging, transportation, and storage of biological products
- designing buildings and engineering environments for animal and product safety and production

Agricultural and Biosystems Engineering (ABEN) brings together the knowledge of living systems, engineering technologies, and a social conscience to solve the tough problems facing our planet. Women and men in ABEN are professional engineers with commitments to the well-being of humans, animals, plants, and ecosystems. They are highly-skilled in developing innovative approaches to solving problems affecting all types of living systems and in developing products from biological resources.

Agricultural and Biosystems engineers will be increasingly important to society as the world becomes more highly populated and our global ecosystem becomes more fragile. Wise decisions about appropriate technology and resources use will require a basic understanding of biological systems. The agricultural and biosystems engineer is uniquely qualified to apply the knowledge in both biological and engineering to solve important societal problems.
The ABEN program integrates Engineering topics, engineering design, and biological sciences in a single program with two concentrations: agricultural engineering (AGEN) and biosystems engineering (BSEN). Courses in the first two years are similar to those required in mechanical, civil, electrical, and industrial engineering. Ag and biosystems engineering courses are emphasized in the last two years. While there is considerable overlap between the AGEN and BSEN concentrations, requirements for BSEN include a heavier concentration on fundamental biological and chemical sciences. AGEN includes a heavier concentration in the engineering sciences.

Educational Objective 1:
Within a few years of graduation, graduates are expected to have established themselves as practicing engineers with the ability to address new and existing engineering challenges in agricultural and closely related biological industries.

Educational Objective 2:
Within a few years of graduation, graduates are expected to have established themselves as practicing engineers who have interpersonal and collaborative skills and the capacity for productive and advancing careers in leadership roles.

Agricultural Systems Management

- Are you interested in agriculture?
- Are you interested in technology and how things work?
- Do you care about the environment and the management of natural resources?
- Do you have an interest in the processing of agricultural commodities into food, feed, fiber, fuel, and other uses?
- Are you interested in the application of high-tech systems to agriculture?
- Are you interested in helping farmers improve productivity without harming the environment?
- Do you like to work with others to find solutions to problems?

If so, you should consider preparing for a career in Agricultural Systems Management (ASM)

The Agricultural Systems Management program emphasizes engineering technology and the management of physical and biological systems for agricultural production, handling and processing of agricultural commodities, and maintaining environmental quality. Agricultural systems management is the application of biological, physical, mechanical, and business knowledge to support and manage agricultural production systems, product processing systems, and related industries.

ASM graduates manage people, money, machines, and business. They excel at management, marketing, sales, and customer service by applying their knowledge of agri-production and agri-processing technology, business management, communications and computer skills. Positions filled by ASM graduates are those that bridge the gap between engineers and the users of engineered systems. The program is designed for students whose interests lie in the application, operation, and management of the equipment (power and machinery), natural resources (soil and water), or commodity handling and processing elements of the agricultural industry.

The ASM program requires successful completion of 128 semester credit hours for graduation. Students are encouraged to specialize in an area of particular career interest. This specialization usually involves obtaining a minor in some complimentary field of study; agribusiness or business administration, production agriculture, applied technology, or dealership management. Laboratory experiences are a part of many of the major courses. This provides the opportunity for “hands-on” learning.

Cooperative Educational Experience

(paid internships for Agricultural and Biosystems Engineering and Agricultural Systems Management undergraduate students) is not required by the curriculum, but students are encouraged to take advantage of these opportunities. These experiences allow students to spend a summer, or more typically, a summer and a semester doing engineering work for an employer of program graduates. Students gain hands-on experience in engineering for the first time. This experience allows students to make an informed decision on their major, to make better selections of elective courses, and to open doors for employment at graduation. Many companies now expect cooperative work experience when hiring new graduates.
Graduate students have been in regular attendance and have participated in the scholarly activities of the campus. The number of degrees awarded increased noticeably after 1920 and again after 1950 in reflection of general trends in higher education in the United States. In 1959, the North Dakota Board of Higher Education first authorized certain departments to offer the Doctor of Philosophy degree. The first Ph.D. degrees were awarded in 1963. Currently, NDSU offers 43 doctoral degrees, 63 masters degree, an education specialist degree and 10 certificate programs.

The Department of Agricultural and Biosystems Engineering offers graduate study leading to M. S. and Ph.D. degrees. The program emphasizes solving engineering problems for agricultural production, food and value-added processing, and environmental resources management.

Advanced work may involve specialized training in the following areas:

- irrigation engineering and management
- value-added processing
- food engineering
- bioprocessing
- machine vision and intelligent sensors for biological systems
- post-harvest handling and storage of biological materials
- agricultural hydrology, soil and water resources management
- biorenewable energy

Student research and academic programs are tailored to individual student needs and interests. Interdisciplinary approaches to agriculture and biosystems engineering programs are fostered.

Student Engineering Branch of ASABE
- professional organization for ABEN students
ASM Club—organization of ASM students
Annual Agricultural Technology Exposition
Alpha Epsilon—national honor society for Agricultural and biosystems engineering
Rodeo Club
Saddle and Sirloin
Society of Women Engineers
Tau Beta Pi—national honor society for engr. students
Bison Pullers—1/4 Scale tractor design and pull competition