

BIOLOGICAL ENGINEERING, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

Program Description

This major helps prepare students for careers involving the application of engineering principles to agricultural and biological production systems, processing systems, and conservation of land and water resources. Education in mathematics, physics, and engineering sciences common to all engineering disciplines is provided along with specialized training in biological and agricultural sciences. The curriculum covers all areas of biological engineering, including development of machines for biological processing and agriculture, postharvest handling and processing, natural resource management and utilization, biological processes, food engineering, and structures and their environmental modifications. A student must select the Agricultural Engineering option, Food and Biological Processing Engineering option, or the Natural Resources Engineering option.

Principles of engineering design experiences are integrated throughout the third-year curriculum by having students solve problems typical of those encountered in the agricultural and biological engineering profession. A year-long major design experience in the fourth year emphasizes that biological engineers must learn not only how to develop engineering solutions to unique, practical problems using the newest technology, but also to assess and integrate the social and ethical implications of their solutions.

Careers for graduates include design, development, and research engineering positions involving biological processes, machinery development, natural resources management, materials handling, biological product development, and structural systems for animals, plants, and crop storage. Biological engineers are employed in industry, consulting firms, and governmental agencies in the United States and abroad. Graduates deal with the various engineering aspects associated with production and processing of food, fiber, and other biological materials, within the constraints of environmental protection and natural resource conservation.

What is Biological Engineering?

Biological engineering involves the study of engineering fundamentals, very similar to traditional engineering disciplines like chemical, civil, or mechanical engineering. What makes biological engineering unique is the integration of these engineering fundamentals with biological, agricultural, and environmental sciences and the holistic approach taken to studying agricultural production, processing of food and other bio-based materials, and natural resource protection. Problem-solving skills are developed and applied to grand engineering challenges such as sustainably providing safe food and clean water.

You Might Like This Program If...

- You enjoy quantitative problem solving and real-life application and/or working outdoors.
- You are interested in a career where you address challenges related to fundamental societal needs, like food, water, fiber, and renewable energy.

- You are passionate about sustainability.
- You want to take application-focused classes with interactive labs and hands-on learning opportunities.