Requirements for a minor may be completed at any campus location offering the specified courses for the minor. Students may not change from a campus that offers their major to a campus that does not offer their major for the purpose of completing a minor.

Program Description

This minor provides students with an opportunity to apply engineering principles to agricultural and biological production and processing systems and to the management of our natural resources. Courses may be selected by students to gain a better understanding of power and machinery, microbiological engineering, soil conservation and water quality, food process engineering, or structures and their environments.

The minor is particularly suitable for students pursuing an undergraduate degree in a different engineering major. Additional prerequisites for courses in the minor may be required including calculus through differential equations, engineering mechanics, fluid dynamics, or thermodynamics. Students interested in pursuing this minor should follow up with the contact provided under Academic Advising to discuss how the minor might integrate with their major and any other questions.

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 then applied to grand engineering challenges such as sustainably providing safe food and clean water.

You Might Like This Program If...

- You are pursuing an engineering major and want to complement it with an engineering minor that offers a different perspective on the connections between agriculture, food, and environment.
- You want to take application-focused classes with interactive labs and hands-on learning opportunities.
- You are interested in solving problems related to fundamental societal needs, like food, water, fiber, and renewable energy.
- You are passionate about sustainability.

Program Requirements

Requirements for the Minor

The minor requires a minimum of 18 credits, at least 6 of which must be at the 400 level.

A grade of C or better is required for all courses in the minor, as specified by Senate Policy 59-10 (https://senate.psu.edu/policies-and-rules-for-undergraduate-students/59-00-minors-and-certificates/#59-10).

Additional Courses: Require a grade of C or better

Select 3-4 credits from the following related science electives:

- AGRO 28  Principles of Crop Management
- ANSC 201  Animal Science
- ASM/ERM 309  Measurement & Monitoring of Hydrologic Systems
- BIOL 110  Biology: Basic Concepts and Biodiversity
- BIOL 127  Introduction to Plant Biology
- BMB 211  Elementary Biochemistry
- BMB/MICRB 251  Molecular and Cell Biology I
- CHEM 202  Fundamentals of Organic Chemistry I
- CHEM 210  Organic Chemistry I
- FDSC 200  Introductory Food Science
- HORT 101  Horticultural Science
- MICRB 201  Introductory Microbiology
- SOILS 101  Introductory Soil Science

Select 6-7 credits from the following 300-level BE courses:

- BE 301  Mathematical Modeling of Biological and Physical Systems
- BE 302  Heat and Mass Transfer in Biological Systems
- BE 303  Structural Systems in Agriculture
- BE 304  Engineering Properties of Food and Biological Materials
- BE 305  Agricultural Measurements and Control Systems
- BE 306  Machines for Agricultural and Biological Processing
- BE 307  Principles of Soil and Water Engineering
- BE 308  Engineering Elements of Biochemistry and Microbiology

Select 6 credits from the following 400-level BE courses:

- BE 461  Design of Fluid Power Systems
- BE 462  Design of Wood Structures
- BE 464  Bioenergy Systems Engineering
- BE 465  Food and Biological Process Engineering
- BE 467  Design of Stormwater and Erosion Control Facilities
- BE 468  Microbiological Engineering
- BE 477  Land-Based Waste Disposal
- BE 487  Land-Based Waste Disposal

Supporting Courses and Related Areas

Supporting Courses and Related Areas: Require a grade of C or better

Select 3 credits of 400-level coursework or independent study in a related science or engineering field in consultation with the minor adviser.
both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (https://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/)

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