BIological ENGINEering, MINor

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).

In addition, at least six credits of the minor must be unique from the prescribed courses required by a student's major(s).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BE 301</td>
<td>Mathematical Modeling of Biological and Physical Systems</td>
<td>6-7</td>
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<tr>
<td>BE 302</td>
<td>Heat and Mass Transfer in Biological Systems</td>
<td>6-7</td>
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<tr>
<td>BE 303</td>
<td>Structural Systems in Agriculture</td>
<td>6-7</td>
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<td>BE 304</td>
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<td>BE 305</td>
<td>Agricultural Measurements and Control Systems</td>
<td>6-7</td>
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<tr>
<td>BE 306</td>
<td>Machines for Agricultural and Biological Processing</td>
<td>6-7</td>
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<tr>
<td>BE 307</td>
<td>Principles of Soil and Water Engineering</td>
<td>6-7</td>
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<tr>
<td>BE 308</td>
<td>Engineering Elements of Biochemistry and Microbiology</td>
<td>6-7</td>
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<tr>
<td>BE 461</td>
<td>Design of Fluid Power Systems</td>
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<td>BE 462</td>
<td>Design of Wood Structures</td>
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<td>BE 464</td>
<td>Bioenergy Systems Engineering</td>
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<td>BE 465</td>
<td>Food and Biological Process Engineering</td>
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<td>BE 467</td>
<td>Design of Stormwater and Erosion Control Facilities</td>
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<td>BE 468</td>
<td>Microbiological Engineering</td>
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<td>BE 477</td>
<td>Land-Based Waste Disposal</td>
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<tr>
<td>BE 487</td>
<td>Simulation Modeling for Water Resources Management</td>
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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.

Academic Advising

The objectives of the university’s academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of...
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/)

University Park
Megan Marshall
Associate Teaching Professor
305 Agricultural Engineering Building
University Park, PA 16802
814-865-3392
mnm11@psu.edu

Contact
University Park
DEPARTMENT OF AGRICULTURAL AND BIOLOGICAL ENGINEERING
105 Agricultural Engineering Building
University Park, PA 16802
814-865-7792
abedept@psu.edu

https://abe.psu.edu