**BIOLOGICAL AND ECOLOGICAL ENGINEERING GRADUATE MAJOR (MENG, MS, PHD)**

**Graduate Areas of Concentration**

*Bio-based products and fuels, bioprocessing, biological systems analysis, ecosystems analysis and modeling, water quality, water resources*

The Department of Biological and Ecological Engineering offers graduate programs leading to the Master of Engineering, Master of Science, and Doctor of Philosophy degrees.

The Biological and Ecological Engineering program serves at the interface of life sciences and engineering. Bioresource engineering is the application of engineering and life science principles and problem-solving techniques to the optimum use and sustainability of biological resources. The curriculum is engineering-based with a strong emphasis on the life sciences. Courses focus on biological systems modeling, bioprocess engineering, thermophysical and molecular properties of biological materials, regional hydrologic analysis, groundwater systems, irrigation and water resource optimization. The department concentrates its research effort on two major thrusts: bioprocess engineering and water resources engineering. Specific research topics include biosensors, molecular-level biosystems analysis, nanosensors, microbial fuel cells, biological hydrogen production, and bio-based products and fuels. Research topics in water resources engineering include constructed wetland treatment systems, crop growth modeling, agricultural and ecological systems analysis, geographical information systems, artificial intelligence technologies, livestock production odor control, livestock waste treatment, and non-point source water pollution control.

For more information contact: Biological and Ecological Engineering Graduate Program, info-bee@oregonstate.edu, 541-737-2041.

**Major Code: 4500**

**MEng**

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<tr>
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<th>Credits</th>
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<tr>
<td>BEE 529</td>
<td>BIOSYS MODELING TECHNIQUES</td>
<td>3</td>
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<tr>
<td>BEE 507</td>
<td>SEMINAR</td>
<td>3</td>
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**Electives**

- Graduate Level Biological Science Courses (or science alternative) as approved by major professor: 9-16
- Additional Graduate Level Engineering Credits as approved by major professor: 9-16

**Thesis**

- BEE 503 | THESIS                         | 21      |

**Total Hours**: 45

**PhD**

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<tr>
<td>BEE 529</td>
<td>BIOSYS MODELING TECHNIQUES</td>
<td>3</td>
</tr>
<tr>
<td>BEE 607</td>
<td>SEMINAR</td>
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**Electives**

- Graduate Level Biological Science Courses (or science alternative) as approved by major professor: 12
- Additional Graduate Level Engineering Credits as approved by major professor: 12

**Thesis**

- BEE 603 | THESIS                         | 21      |

**Total Hours**: 78

**Total Hours**: 108

**Prerequisite and Requisite Coursework for all BEE graduate degrees**

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<thead>
<tr>
<th>Code</th>
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<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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**Applied Differential Equations**

- One course, equivalent to:
  - MTH 256 | Calculus-based Physics          | 4       |

**Chemistry**

- One course, equivalent to:
  - CH 201 | CHEMISTRY FOR ENGINEERING MAJORS | 3       |
  - CH 202 | CHEMISTRY FOR ENGINEERING MAJORS | 3       |
  - CH 205 | LABORATORY FOR CH 202          | 1       |
  - CH 211 | RECITATION FOR CHEMISTRY 201    | 1       |
  - CH 212 | RECITATION FOR CHEMISTRY 202    | 1       |

- MTH 254 can be substituted with MTH 306

**Major Code: 4500**