CURRICULUM IN AGRICULTURAL & BIOLOGICAL ENGINEERING  
UNIVERSITY of ILLINOIS at URBANA-CHAMPAIGN 
For the degree of Bachelor of Science in Agricultural and Biological Engineering 

BIOLOGICAL ENGINEERING CONCENTRATION

Agricultural and biological engineering is the application of mathematics, physical and biological science, and engineering to agriculture, food systems, energy, the environment, and related biological systems. The ABET-accredited B.S. Degree in Agricultural and Biological Engineering provides a concentration in Biological Engineering that integrates life sciences with engineering in the advancement and application of fundamental concepts of biological systems from molecular to ecosystem levels. Understanding the complexity inherent to biological systems is important in designing solutions in the areas of bioenergy, bioprocessing, nanotechnology, biosensing, bio-informatics, and bioenvironment. Within this concentration, student are required to select a set of coherent courses that constitutes a specialization in their area of career interest either from the following list or a customized area chosen in consultation with an advisor: Bioenvironmental Engineering, Ecological Engineering, Food and Bioprocess Engineering, Nanoscale Biological Engineering.

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABE 100 - Intro Agric &amp; Biological Engrg</td>
<td>1</td>
<td>ABE 141 – ABE Principles: Biological</td>
<td>2</td>
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<tr>
<td>CHEM 102 - General Chemistry I</td>
<td>3</td>
<td>CHEM 104 - General Chemistry II</td>
<td>3</td>
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<tr>
<td>CHEM 103 - General Chemistry Lab I</td>
<td>3</td>
<td>CHEM 105 - General Chemistry Lab II</td>
<td>1</td>
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<tr>
<td>ENG 100 - Engineering Orientation</td>
<td>0</td>
<td>MATH 231 – Calculus II</td>
<td>3</td>
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<tr>
<td>GE 101 - Engineering Graphics &amp; Design or RHET 105 - Principles of Composition</td>
<td>3-4</td>
<td>PHYS 211 – University Physics: Mechanics</td>
<td>4</td>
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<tr>
<td>MATH 221 - Calculus I</td>
<td>4</td>
<td>RHET 105 - Principles of Composition or GE 101 - Engineering Graphics &amp; Design</td>
<td>4-3</td>
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<tr>
<td>Liberal education elective</td>
<td>3</td>
<td>Total</td>
<td>17-16</td>
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<tr>
<td>Total</td>
<td>15-16</td>
<td></td>
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| FIRST YEAR | | SECOND YEAR | | THIRD YEAR | | FOURTH YEAR | |
|------------|---|------------|---|------------|---|------------|
| MATH 241 - Calculus III | 4 | MATH 285 - Intro Differential Equations | 3 | Biological and natural sciences elective | 3 |
| PHYS 212 - University Physics: Elec & Mag | 4 | CHEM 232 – Elementary Organic Chemistry I | 3 | Liberal education elective | 3 |
| TAM 210 - Intro to Statics or TAM 211 - Statics | 2 | PHYS 213 - University Physics: Thermal Physics | 2 | Total | 16 |
| Total | 17 | Total | 17 | Total | 16 |

| FOURTH YEAR | | TOTAL HOURS FOR DEGREE... | 128 |
|-------------|---|--------------------------|
| ABE 430 - Project Management | 2 | Biological and natural sciences elective | 3 |
| Agricultural & biological engineering technical elective | 3 | Technical elective | 3 |
| Technical elective | 3 | Liberal education elective | 3 |
| Liberal education elective | 3 | Free elective | 3 |
| Free elective | 3 | Total | 16 |
| Total | 14 | | |

1 RHET 105 may be taken in the first or second semester of the first year as authorized. The alternative is GE 101. Students may take SPCM 111 and 112 in place of RHET 105.
2 MATH 220 – Calculus may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.
3 Students must satisfy the 18-hour liberal education requirements of the College of Engineering, including ECON 103 (or either ECON 102 or ACE 100 by permission) and the campus general education requirements for social sciences and humanities.
4 ABE 469 satisfies the general education advanced composition requirement.
5 The extra hour of credit for this course may be used to help meet free elective requirements.
6 Students in the Biological Engineering concentration must complete 6 hours from the Biological and Natural Sciences approved list.
7 Students must complete 15 hours of technical electives; at least 8 hours must be from the approved list of Agricultural and Biological Engineering courses and the remainder selected from the approved Other Technical Electives List.
Technical Electives for Biological Engineering Concentration (15 hours minimum with one course fulfilling a lab requirement)

Agricultural & Biological Engineering Technical Electives; at least 8 hours from:

- ABE 374\* Env Control for Buildings..................... 3
- ABE 397 Independent Study ................................ 1-4
- ABE 398\* Special Topics .................................. 1-4
- ABE 425\* Engrg Measurement Systems .................. 4
- ABE 436 Renewable Energy Systems .................... 3
- ABE 446 Biological Nanoengineering .................... 3-4
- ABE 455 Erosion and Sediment Control ................ 2
- ABE 456\* Land & Water Resources Engineering ...... 3-4

Other Technical Electives: remainder of the 15 hours from list below or any 300 or 400 level engineering course approved by advisor:

- CEE 330 Environmental Engineering .................... 3
- CEE 430 Ecological Quality Engineering ................ 2
- CEE 431 Biomonitoring .................................... 3
- CEE 432 Stream Ecology .................................. 3
- CEE 437 Water Quality Engineering ..................... 3
- CEE 444 Env Eng Principles, Biological ............... 3
- CEE 449\* Environmental Engineering Lab ............. 3
- CHBE 221 Principles of CHE ............................. 3
- CHBE 421 Momentum and Heat Transfer ................ 4
- CHBE 422 Mass Transfer Operations ..................... 4
- CHBE 471 Biochemical Engineering ..................... 3
- CHBE 472 Techniques in Biomolecular Engineering .... 3

Eligible courses meeting laboratory requirement.

*Other courses with a strong biological or biotech content may be approved by chief advisor.

Technical elective credit may be given with chief advisor approval.

Other courses may be approved by chief advisor.

Updated: 10/25/12