## BIOLOGICAL SYSTEMS ENGINEERING CURRICULUM
### BIORENEWABLE RESOURCES OPTION
A total of 128 credits required for graduation  
*(2021-2022 Catalog)*

### I. Communications (10 credits)
- 3 cr. ENGL 150 (FSSS)  
  Critical Thinking and Communication
- 3 cr. ENGL 250 (FSSS)  
  Written, Oral, Visual, and Electronic Composition
- 3 cr. Comm. Elective  
  Select one of the courses below:
  - ENGL 309 (FS)  
    Report and Proposal Writing
  - ENGL 314 (FSSS)  
    Technical Communication
  - MKT 450 (FS)  
    Advanced Professional Selling
  - SP CM 212 (FSSS)  
    Fundamentals of Public Speaking
  - AG EDS 311 (FS)  
    Presentation and Sales Strategies for Ag Audiences
- 1 cr. LIB 160 (FSSS)  
  Information Literacy

### II. Mathematical Sciences (15 credits)
- 4 cr. MATH 165 (FSSS)  
  Calculus I
- 4 cr. MATH 166 (FSSS)  
  Calculus II
- 4 cr. MATH 267 (FSSS)  
  Elementary Differential Equations and Laplace Transforms
- 3 cr. STAT 305 (FSSS)  
  Engineering Statistics

### III. Biological, Chemical and Physical Science Common Core (25 credits)
- 3 cr. BIOL 212 (FSSS)  
  Principles of Biology II
- 4 cr. CHEM 167 (FS)  
  General Chemistry for Engineering Students
- or CHEM 177 and 178 (FS)  
  General Chemistry I and II
- 1 cr. CHEM 167L (FS)  
  Laboratory in General Chemistry for Engineers
- or CHEM 177L (FS)  
  Laboratory in General Chemistry I
- 8 cr. Recommendations for Chemistry Sequence I and II with labs
  **Biorenewable Resources and Bioenvironmental Engineering Option**
  Chem Seq I w/Lab (4 cr.)
  - CHEM 231 (2 cr.) +  
    Elementary Organic Chemistry +
  - 231L (2 cr.) (FSSS)  
    Elementary Organic Chemistry Lab
  Chem Seq II w/ Lab (4 cr.)
  - CHEM 211 (2 cr.) +  
    Quantitative & Environmental Analysis +
  - 211L (2 cr.) (FS)  
    Quantitative & Environmental Analysis Lab
  **Food Engineering Option**
  Chem. Seq I w/Lab (4 cr.)
  - CHEM 231 (3 cr.) +  
    Elementary Organic Chemistry +
  - 231L (1 cr.) (FSSS)  
    Elementary Organic Chemistry Lab
  Chem Seq. II w/ Lab (4 cr.)
  - FS HN 311 (3 cr.)+  
    Food Chemistry +
  - 311L (1cr.) (F)  
    Food Chemistry Lab (preferred for Food Engineering option)
  **Open Option**
  Chem Seq I w/Lab (4 cr.)
  - CHEM 331 (3 cr.)+  
    Organic Chemistry I +
  - 331L (1 cr.) (FSSS)  
    Organic Chemistry I Lab
  Chem Seq II w/ Lab (4 cr.)
  - CHEM 332 (3 cr.) +  
    Organic Chemistry II +
  - 332L (1 cr.) (FSSS)  
    Organic Chemistry II Lab
- 3 cr. MICRO 302 (FS)  
  Biology of Microorganisms
- 1 cr. MICRO 302L (FS)  
  Microbiology Laboratory
- 4 cr. PHYS 231 (FSSS)  
  Introduction to Classical Physics I
- 1 cr. PHYS 231L (FSSS)  
  Introduction to Classical Physics I Lab
IV. **Social Sciences and Humanities** (12 credits)
3 cr. U. S. Diversity Course
3 cr. International Perspective Course
6 cr. Social Science and Humanities Electives (Select from departmental-approved list).

V. **Engineering Core** (27 credits)
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<tr>
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<tr>
<td>R</td>
<td>ENGR 101 (FS)</td>
<td>Engineering Orientation</td>
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<tr>
<td>1</td>
<td>A B E 110 (S)</td>
<td>Experiencing Biological Systems Engineering</td>
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<td>3</td>
<td>A B E 160 (FS)</td>
<td>Engineering Problems with Computer Applications Laboratory</td>
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<td>A B E 170 (FS)</td>
<td>Engineering Graphics and Introductory Design</td>
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<td>A B E 378 (FS)</td>
<td>Mechanics of Fluids</td>
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<td>C E 274 (FSSS)</td>
<td>Statics of Engineering</td>
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<td>E M 324 (FSSS)</td>
<td>Mechanics of Materials</td>
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<td>Mechanics of Materials Laboratory</td>
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<td>I E 305 (FSSS)</td>
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<td>M E 231 (FSSS)</td>
<td>Engineering Thermodynamics I</td>
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<td>M E 436 (FSSS)</td>
<td>Heat Transfer</td>
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VI. **Biological Systems Engineering Core** (30 credits)
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<td>A B E 201 (FS)</td>
<td>Preparing for Workplace Seminar</td>
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<td>A B E 216 (F)</td>
<td>Fundamentals of Agricultural and Biosystems Engineering</td>
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<td>A B E 218 (S)</td>
<td>Project Management &amp; Design in Agricultural and Biosystems Engr</td>
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<td>A B E 273 (FS)</td>
<td>CAD for Process Facilities and Land Use Planning</td>
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<td>3</td>
<td>A B E 316 (FS)</td>
<td>Applied Numerical Methods for Agricultural and Biosystems Engr</td>
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<td>A B E 363 (FS)</td>
<td>Agri-Industrial Applications of Electric Power and Electronics</td>
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<td>3</td>
<td>A B E 380 (S)</td>
<td>Principles of Biological Systems Engineering</td>
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<td>A B E 404 (F)</td>
<td>Instrumentation for Agricultural and Biosystems Engineering</td>
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<td>A B E 415 (FS)</td>
<td>Agricultural and Biosystems Engineering Design I</td>
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<td>A B E 416 (FS)</td>
<td>Agricultural and Biosystems Engineering Design II</td>
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<td>A B E 451 (S)</td>
<td>Food and Bioprocess Engineering</td>
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<td>A B E 480 (F)</td>
<td>Engineering Analysis of Biological Systems</td>
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VII. **Biorenewable Resources Option** (9 credits)
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<td>A B E 325 (F)</td>
<td>Biorenewable Systems</td>
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<tr>
<td>3</td>
<td>A B E 469 (S)</td>
<td>Grain Processing and Handling</td>
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<td>Biorenewable Elective</td>
<td>Select one of the courses below</td>
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<tr>
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<td>FS HN 471 (F)</td>
<td>Food Processing I</td>
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<td>SCM 301</td>
<td>Supply Chain Management</td>
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*Please check the current catalog and Schedule of Classes for most recent offerings*