

**BIOLOGICAL SYSTEMS ENGINEERING CURRICULUM  
OPEN OPTION**

A total of 128 credits required for graduation  
(2017-2018 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:
	<i>ENGL 309 (FS)</i>	<i>Report and Proposal Writing</i>
	<i>ENGL 314 (FSSS)</i>	<i>Technical Communication</i>
	<i>MKT 343 (FS)</i>	<i>Personal Sales</i>
	<i>SP CM 212 (FSSS)</i>	<i>Fundamentals of Public Speaking</i>
	<i>AG EDS 311 (FS)</i>	<i>Presentation and Sales Strategies for Ag Audiences</i>
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) or CHEM 177 and 178 (FS)	General Chemistry for Engineering Students General Chemistry I and II
1 cr.	CHEM 167L (FS) or CHEM 177L (FS)	Laboratory in General Chemistry for Engineers Laboratory in General Chemistry I
3 cr.	MICRO 302 (FS)	Biology of Microorganisms
1 cr.	MICRO 302L (FS)	Microbiology Laboratory
5 cr.	PHYS 221 (FSSS)	Introduction to Classical Physics I

*Select from one of the following three Chemistry Sequences (all include labs)*

8 cr.	CHEM Seq. I <i>CHEM 231 (3cr) + 231L (3cr) (FSSS) CHEM 211 (2cr) + 211L (2cr) (FS)</i>	Recommended for Biorenewable and Bioenvironmental Options <i>Elementary Organic Chemistry + Elementary Organic Chemistry Lab Quantitative &amp; Environmental Analysis + Quantitative &amp; Environmental Analysis Lab</i>
8 cr.	CHEM Seq. II <i>CHEM 231 (3cr) + 231L (3cr) (FSSS) FS HN 311 (3cr)+ FS HN 311L (1cr)(F)</i>	Recommended for Food Option <i>Elementary Organic Chemistry + Elementary Organic Chemistry Lab Food Chemistry + Food Chemistry Lab (preferred for Food Engineering option)</i>
8 cr.	CHEM Seq. III <i>CHEM 331 (3cr)+ 331L(1cr) (FSSS) CHEM 332 (3cr) + 332L (1cr)(FSSS)</i>	Recommended for Open Option <i>Organic Chemistry I + Organic Chemistry I Lab Organic Chemistry II + Organic Chemistry II Lab</i>

**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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|-------|----------------|--|
| R cr. | ENGR 101 (FS)  | Engineering Orientation                                    |
| 1 cr. | A B E 110 (S)  | Experiencing Biological Systems Engineering                |
| 3 cr. | A B E 160 (FS) | Engineering Problems with Computer Applications Laboratory |
| 3 cr. | A B E 170 (FS) | Engineering Graphics and Introductory Design               |
| 3 cr. | E M 274 (FSSS) | Statics of Engineering                                     |
| 3 cr. | E M 324 (FSSS) | Mechanics of Materials                                     |
| 1 cr. | E M 327 (FSSS) | Mechanics of Materials Laboratory                          |
| 3 cr. | E M 378 (FSSS) | Mechanics of Fluids  |
| 3 cr. | I E 305 (FSSS) | Engineering Economic Analysis                              |
| 3 cr. | M E 231 (FSSS) | Engineering Thermodynamics I                               |
| 4 cr. | M E 436 (FSSS) | Heat Transfer  |

**VI. Biological Systems Engineering Core (30 credits)**

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|-------|----------------|--|
| 1 cr. | A B E 201 (FS) | Preparing for Workplace Seminar  |
| 3 cr. | A B E 216 (F)  | Fundamentals of Agricultural and Biosystems Engineering                |
| 2 cr. | A B E 218 (S)  | Project Management & Design in Agricultural and Biosystems Engineering |
| 1 cr. | A B E 273 (FS) | CAD for Process Facilities and Land Use Planning                       |
| 3 cr. | A B E 316 (FS) | Applied Numerical Methods for Agricultural and Biosystems Engineering  |
| 4 cr. | A B E 363 (FS) | Agri-Industrial Applications of Electric Power and Electronics         |
| 3 cr. | A B E 380 (S)  | Principles of Biological Systems Engineering                           |
| 3 cr. | A B E 404 (F)  | Instrumentation for Agricultural and Biosystems Engineering            |
| 2 cr. | A B E 415 (FS) | Agricultural and Biosystems Engineering Design I                       |
| 2 cr. | A B E 416 (FS) | Agricultural and Biosystems Engineering Design II                      |
| 3 cr. | A B E 451 (S)  | Food and Bioprocess Engineering  |
| 3 cr. | A B E 480 (F)  | Engineering Analysis of Biological Systems                             |

**VII. Open Option (9 credits)**

The open option is appropriate for students not wishing to specialize in one of the three core options associated with the BSE major. The option is also appropriate for student who are considering professions outside of engineering such as law or medicine. Students can take any 8-9 credits in 200 or above level courses. Please see a BSE adviser for other potential sequence options.

**Sequence I, II & III.** *Select 9 credits of 200 level or above in a two to three course sequence:*

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|-------|------------------------------|------------------------------------|
| 8 cr. | BIOL 255 + Lab, 256 + Lab    | Human Physiology Sequence          |
| 8 cr. | BIOL 313+Lab, 314 + Lab      | Molecular Biology Sequence         |
| 9 cr. | BBMB 404,405, & 411          | Biochemistry Sequence              |
| 9 cr. | COM S 207, BCBIO 401 & 402   | Bioinformatics Sequence            |
| 9 cr. | MGMT 310, 313, 414 or 419    | Management Sequence                |
| 9 cr. | JL MC 201, 202 & 347         | Science Writing Sequence           |
| 9 cr. | POL S 215, 319, & 320        | Political Science Sequence         |
| 9 cr. | A B E 388, AGRON 342, ME 484 | Globalization Sequence             |
| 1 cr. | A B E 418                    | Fundamentals of Engineering Review |

*\*Please check the current catalog and Schedule of Classes for most recent offerings*