

**BIOLOGICAL SYSTEMS ENGINEERING CURRICULUM
OPEN OPTION**

A total of 128 credits required for graduation
(2019-2020 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 450 (FS)</i>	<i>Advanced Professional Selling</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)	General Chemistry for Engineering Students
	or CHEM 177 <u>and</u> 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	

Open Option

Chem Seq I w/Lab (4 cr.)

<i>CHEM 331 (3 cr.)+</i>	<i>Organic Chemistry I +</i>
<i>331L (1 cr.) (FSSS)</i>	<i>Organic Chemistry I Lab</i>

Chem Seq II w/ Lab (4 cr.)

<i>CHEM 332 (3 cr.) +</i>	<i>Organic Chemistry II +</i>
<i>332L (1 cr.) (FSSS)</i>	<i>Organic Chemistry II Lab</i>

Bioenvironmental and Biorenewable Resources Engineering Option

Chem Seq I w/Lab (4 cr.)

<i>CHEM 231 (2 cr.)</i>	<i>Elementary Organic Chemistry +</i>
<i>231L (2 cr.) (FSSS)</i>	<i>Elementary Organic Chemistry Lab</i>

Chem Seq II w/ Lab (4 cr.)

<i>CHEM 211 (2 cr.) +</i>	<i>Quantitative & Environmental Analysis +</i>
<i>211L (2 cr.) (FS)</i>	<i>Quantitative & Environmental Analysis Lab</i>

Food Engineering Option

Chem. Seq I w/Lab (4 cr.)

<i>CHEM 231 (3 cr.) +</i>	<i>Elementary Organic Chemistry +</i>
<i>231L (1 cr.) (FSSS)</i>	<i>Elementary Organic Chemistry Lab</i>

Chem Seq. II w/ Lab (4 cr.)

<i>FS HN 311 (3 cr.)+</i>	<i>Food Chemistry +</i>
<i>311L (1cr.) (F)</i>	<i>Food Chemistry Lab (preferred for Food Engineering option)</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

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)

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)

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 Engr

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 Engr

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 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*

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

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