

**BIOLOGICAL SYSTEMS ENGINEERING CURRICULUM
BIORENEWABLE RESOURCES ENGINEERING OPTION**

A total of 128 credits required for graduation
(2016-2017 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. Elect.	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 and Physical Science Common Core (22 credits)

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
5 cr.	PHYS 221 (FSSS)	Introduction to Classical Physics I
5 cr.	PHYS 222 (FSSS)	Introduction to Classical Physics II
3 cr.	BIOL 212 (FSSS)	Principles of Biology II
3 cr.	MICRO 302 (FSSS)	Biology of Microorganisms
1 cr.	MICRO 302L (FSSS)	Microbiology Laboratory

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 (23 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.	M E 231 (FSSS)	Engineering Thermodynamics I
6 cr.	Heat/Mass Transport Seq.	Select one of the sequences below:
	<i>E M 378 & M E 436</i>	<i>Mechanics of Fluids & Heat Transfer</i>
	<i>CH E 356 & CH E 357</i>	<i>Transport Phenomena I & II</i>

VI. Biological Systems Engineering Core (26 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 Engineering
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 480 (F)	Engineering Analysis of Biological Systems

VII. Biorenewable Resources Engineering Option (20 credits)

3 cr.	CHEM 331 (FSSS)	Organic Chemistry I
1 cr.	CHEM 331L (FSSS)	Laboratory in Organic Chemistry I
3 cr.	CHEM 332 (FSSS)	Organic Chemistry II
1 cr.	CHEM 332L (FSSS)	Laboratory in Organic Chemistry II
3 cr.	A B E 325 (F)	Biorenewable Systems
3 cr.	Technical Elective	Any non-seminar/internship/travel 300 and 400 level Engineering course not required for the option

Biorenewable Elective I & II. *Select 6 credits from the following:*

4 cr.	Biol 312 (FSS)	Ecology
3 cr.	Biol 313 (FSSS)	Principles of Genetics
3 cr.	TSM 310 (S)	Total Quality Improvement
3 cr.	TSM 270 (F)	Principles of Injury Prevention
2 cr.	TSM 371 (S)	Occupational Safety Management
2 cr.	TSM 372 (Alt. F)	Legal Aspects of Occupational Safety and Health
3 cr.	ECON 207 (FS)	Applied Economic Optimization
1 cr.	A B E 273	CAD for Process Facilities and Land Use Planning
1 cr.	A B E 418	Fundamentals of Engineering Review
3 cr.	A B E 388 (F)	Sustainable Engineering and International Development
3 cr.	A B E 469 (S)	Grain Processing and Handling
3 cr.	A B E 506	Applied Computational Intelligence
3 cr.	FS HN 471 (F)	Food Processing I
3 cr.	BRT 501(S)	Fundamentals of Biorenewable Resources
3 cr.	MGMT 370 (FSSS)	Management of Organizations

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