

BIOLOGICAL SYSTEMS ENGINEERING CURRICULUM
BIOENVIRONMENTAL ENGINEERING OPTION

A total of 127 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)

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| 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)

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|-------|---|---|
| 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 | |
| | 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> |
| | 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> |
| 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 (26 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. C E 372 (FS) Engineering Hydrology and Hydraulics
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

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. Bioenvironmental Engineering Option (9 credits)

3 cr. C E 326 (FS) Principles of Environmental Engineering
3 cr. A B E 431 (F) Design and Evaluation of Soil & Water Conservation Systems
3 cr. Bioenvironmental Elective Select one of the courses below
 A B E 432 (odd S) Nonpoint Source Pollution and Control
 A B E 436 (even S) Design and Evaluation of Soil and Water Monitoring Systems
 A B E 537 (odd F) Total Maximum Daily Load Development and Implementation
 A ECL 418 (alt F) Stream Ecology
 C R P 251(F) Fundamentals of Geographic Information System
 ENSCI 270X (F) Geospatial Technologies
 ENSCI 461I (4cr) (SS) Introduction to GIS
 GEOL 452 (F) GIS for Geoscientists
 NREM 345 (S) Natural Resource Photogrammetry and Geographic Info Syst.
 NREM 446 (F) Integrating GPS & GIS for Natural Resources Management
 NREM 466 (odd S) Ecosystem Service Management
 NREM 489 (S) Survey of Remote Sensing Technologies

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