

BIOLOGICAL SYSTEMS ENGINEERING CURRICULUM
BIOENVIRONMENTAL ENGINEERING OPTION

A total of 127 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) | 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 | |
| | 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 |
| | <i>A B E 432 (odd S)</i> | <i>Nonpoint Source Pollution and Control</i> |
| | <i>A B E 436 (even S)</i> | <i>Design and Evaluation of Soil and Water Monitoring Systems</i> |
| | <i>A B E 537 (odd F)</i> | <i>Total Maximum Daily Load Development and Implementation</i> |
| | <i>A ECL 418 (alt F)</i> | <i>Stream Ecology</i> |
| | <i>C R P 251(F)</i> | <i>Fundamentals of Geographic Information System</i> |
| | <i>ENSCI 461I (4cr) (SS)</i> | <i>Introduction to GIS</i> |
| | <i>GEOL 452 (F)</i> | <i>GIS for Geoscientists</i> |
| | <i>NREM 345 (S)</i> | <i>Natural Resource Photogrammetry and Geographic Info Syst.</i> |
| | <i>NREM 446 (F)</i> | <i>Integrating GPS & GIS for Natural Resources Management</i> |
| | <i>NREM 466 (odd S)</i> | <i>Ecosystem Service Management</i> |
| | <i>NREM 489 (S)</i> | <i>Survey of Remote Sensing Technologies</i> |

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