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:
        ENGL 309 (FS) Report and Proposal Writing
        ENGL 314 (FSSS) Technical Communication
        MKT 343 (FS) Personal Sales
        SP CM 212 (FSSS) Fundamentals of Public Speaking
        AG EDS 311 (FS) Presentation and Sales Strategies for Ag Audiences
   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 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
   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 Recommended for Biorenewable and Bioenvironmental Options
       CHEM 231 (3cr) + Elementary Organic Chemistry +
       231L (3cr) (FSSS) Elementary Organic Chemistry Lab
       CHEM 211 (2cr) + Quantitative & Environmental Analysis +
       211L (2cr) (FS) Quantitative & Environmental Analysis Lab

   8 cr. CHEM Seq. II Recommended for Food Option
       CHEM 231 (3cr) + Elementary Organic Chemistry +
       231L (3cr) (FSSS) Elementary Organic Chemistry Lab
       FS HN 311 (3cr)+ Food Chemistry +
       FS HN 311L (1cr)(F) Food Chemistry Lab (preferred for Food Engineering option)

   8 cr. CHEM Seq. III Recommended for Open Option
       CHEM 331 (3cr)+ Organic Chemistry I +
       331L(1cr) (FSSS) Organic Chemistry I Lab
       CHEM 332 (3cr) + Organic Chemistry II +
       332L (1cr)(FSSS) Organic Chemistry II Lab
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 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 Biosystemss 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:**
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*