BIOSYSTEMS ENGINEERING: EXAMPLE OF A 8-TERM PROGRAM

*Pre- and co-requisites for Biosystems Engineering Science and Design Electives are dependent on course selection

Term 1 Fall

- **Physics I: Mechanics**
  - PHYS 1050(3)
- **Written English Requirement**
- **Applied Calculus 1**
  - MATH 1510(3)
- **Computer Program for Sci & Eng**
  - COMP 1012(3)
- **Chemistry**
  - CHEM 1300(3)

Term 2 Winter

- **Intro to Statics**
  - ENG 1440(3)
- **Design in Engineering**
  - MATH 1430(3)
- **Bio Eng Design 1**
  - BIOE 2900(4)
- **Eng Math Analysis 2**
  - MATH 2132(3)
- **Introduction to Elect & Comp Eng Techniques**
  - ENG 1450(3)
- **Eng CAD Technology**
  - ENG 2022(3)

Term 3 Fall

- **Solid Mechanics I**
  - BIOE 2800(4) or CIVL 2800(4)
- **Bio Eng Design 1**
  - BIOE 2900(4)
- **Eng Math Analysis 2**
  - MATH 2132(3)
- **Numerical Methods**
  - MECH 2150(4), MATH 2120(4) or CIVL 3590(4)
- **Biology for Engineers**
  - BIOE 2590(3)
- **Transport Phenomenon**
  - BIOE 2480(3)

Term 4 Winter

- **Fluid Mechanics**
  - BIOE 2790 or CIVL 2790(4)
- **Numerical Methods**
  - MECH 2150(4), MATH 2120(4) or CIVL 3590(4)
- **Biology for Engineers**
  - BIOE 2590(3)
- **Impact on Eng on the Enviro**
  - BIOE 2480(3)

Term 5 Fall

- **Kinematics & Dynamics**
  - MECH 3482(4)
- **Eng Prop Biological Materials**
  - BIOE 3320(4)
- **BIOE Design Elective**
- **Instru & Measure for Biosystems**
  - BIOE 3270(4)

Term 6 Winter

- **BIOE Design Elective**
- **Free Elective (See Note 2 below)**
- **Graduation Project**
  - (offered in both terms)

Term 7 Fall

- **Tech & Society**
  - ANTH 2430(3), ENG 3020(3) or CIVL 4460(3)
- **BIOE Design Elective**
- **Free Elective (See Note 2 below)**
- **Complementary Studies (See Note 2 below)**

Term 8 Winter

- **BIOE 4900 & 4950 must be taken in the same academic year**
- **BIOE Design Elective**

**NOTE 1: Choose 2 courses**

*(specific courses are to be taken if completing a specialization)*

- AGEC 2370 Principles of Ecology or BIOL 2300 Principles of Ecology
- ANSC 3530 The Animal and its Environment
- BIOE 2600 Plant and Animal Physiology for Engineers
- BIOL 1410 Anatomy of the Human Body
- BIOL 1412 Physiology of the Human Body
- PLNT 2510 Fundamentals of Horticulture
- SOIL 4060 Physical Properties of Soil

**NOTE 2: Course is to be selected from a specified list if completing a specialization**

**NOTE 2: See Design Elective Information Sheet for listing of all Design Electives offered**
DEPARTMENT OF BIOSYSTEMS ENGINEERING
For students starting second year Fall 2016
Students are expected to follow either the 4 year or the 5 year model program.
This will ensure prerequisite and timetable requirements are met.

PRELIMINARY ENGINEERING PROGRAM: The following 12 courses must be completed by all engineering students.

<table>
<thead>
<tr>
<th>2015</th>
<th>cr hr</th>
<th>Pre- (p) or Co- (c) Requisites</th>
<th>cr hr</th>
<th>Pre- (p) or Co- (c) Requisites</th>
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<tbody>
<tr>
<td>Complementary Studies Elective</td>
<td>3</td>
<td>Eng 1430 Engineering Design</td>
<td>3</td>
<td>Eng 1440 Engineering Statics</td>
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<tr>
<td>CHEM 1300</td>
<td>Chemistry</td>
<td>ENG 1450 Intro Elec &amp; Comp Eng</td>
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<td>ENG 1440 Engineering Statics</td>
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<td>COMP 1012</td>
<td>Comp Prog Eng</td>
<td>ENG 1450 Intro Elec &amp; Comp Eng</td>
<td>3</td>
<td>ENG 1440 Engineering Statics</td>
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<tr>
<td>ENG 1460</td>
<td>Thermal Sciences</td>
<td>Written English Requirement</td>
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<td>MATH 1210 C/L Algebra</td>
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<td>MATH 1510</td>
<td>Applied Calculus 1</td>
<td>MATH 1210 C/L Algebra</td>
<td>3</td>
<td>MATH 1710 Applied Calculus 2</td>
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<td>PHYS 1050</td>
<td>Physics</td>
<td>MATH 1500/1510 (p or c)</td>
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<td>PHYS 1050 (p or c)</td>
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ADMISSION TO BIOSYSTEMS ENGINEERING PROGRAM: Any Preliminary Engineering courses not yet completed should be taken in Second Year if possible.

SECOND YEAR 2016

<table>
<thead>
<tr>
<th>FALL TERM (September)</th>
<th>WINTER TERM (January)</th>
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<tbody>
<tr>
<td>BIOE 2110 Transport Phenomenon</td>
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<tr>
<td>BIOE 2590 Biology for Engineers</td>
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</tr>
<tr>
<td>BIOE 2900 Design 1</td>
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</tr>
<tr>
<td>CIVL 2790 Fluid Mechanics (or BIOE 2790)</td>
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<tr>
<td>CHEM 1310 Chem 2 (or CHEM 1110 &amp; 1126)</td>
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<tr>
<td>MATH 2132 Math Analysis 2</td>
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THIRD YEAR 2017

<table>
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<tr>
<th>FALL TERM (September)</th>
<th>WINTER TERM (January)</th>
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</thead>
<tbody>
<tr>
<td>BIOE 3400 Des of Struc Comp Mach</td>
<td>4</td>
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<tr>
<td>BIOE 3590 Mechanics of Biomater</td>
<td>4</td>
</tr>
<tr>
<td>BIEO 3900 Design 2</td>
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</tr>
<tr>
<td>MBIO 1220 Essentials of Microbiology</td>
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<tr>
<td>BIOE Design Elective slot (see Note 2)</td>
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<tr>
<td>Elective slot (see Note 1 below)</td>
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FOURTH YEAR 2018

<table>
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<tr>
<th>FALL TERM (September)</th>
<th>WINTER TERM (January)</th>
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<tbody>
<tr>
<td>BIOE 4900** Design 3</td>
<td>4</td>
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<tr>
<td>BIOE 4240* Graduation Project</td>
<td>3</td>
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<tr>
<td>BIOE Design Elective slot (see Note 2)</td>
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<tr>
<td>Elective slot (see Note 1 below)</td>
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</tr>
<tr>
<td>Elective slot (see Note 1 below)</td>
<td>3/4</td>
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</table>

*Students may register for BIOE 4240 Graduation Project in either term.
**BIOE 4900 & 4950 must be taken in the same academic year

Note 1: Must choose two science electives, two complementary studies electives, and two free electives.
(Science electives should be completed by end of Third Year.) Choose from specified lists if a Specialization is desired.

Note 2: Three BIOE design electives are required (out of the four slots shown). Choose from specified lists if a Specialization is desired.

Biomedical Specialization:
Students in the Biomedical Specialization should take BIOL 1410 (Fall) and BIOL 1412 (Winter) in the elective slots of third year.

Bioresource Specialization:
Students in the Bioresource Specialization should take BIOE 2600 (alternatively ANSC 3530 in the Winter of second year or PLNT 2510* in the Fall of third year) and SOIL 4060 in the Winter of third year.

Environmental Specialization:
Students in the Environmental Specialization should take BIOE 2600 (alternatively BIOL 2300 in the Winter of second year or AGEC 2370 in the Fall of third year) and SOIL 4060 in the Winter of third year.

1. PLNT 2510 is only offered in the fall every two years.