BIOSYSTEMS ENGINEERING: EXAMPLE OF AN 8-TERM PROGRAM

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

Term 1
Fall
- Physics I
  - PHYS 1050(3)
- Written
  - English
  - Requirement
- Intro to Statics
  - ENGR 1440(3)
- Design in Engineering
  - ENG 1430(3)
- Intro to Statics
  - ENGR 1440(3)
- Design in Engineering
  - ENG 1430(3)
- Fluid Mechanics
  - BIEE 2790(4)
- Bio Eng Design 1
  - BIEE 2900(4)
- Mechanic
  - BIEE 3590(4)
- Kinematics
  - MECH 3482(4)
- Eng Prop Biological Materials
  - BIEE 3320(4)
- Bio Design Elective
  - BIEE 3400(4)
- Inst & Measure for Biosystems
  - BIEE 3270(4)
- Biomec
  - BIEE 3590(4)
- Design of Struct Comp in Machines
  - BIEE 3400(4)
- Bio Design Elective
  - BIEE 3400(4)

Term 2
Winter
- Computer Program for Sci & Eng
  - MATH 1510(3)
- Applied Calculus 1
  - MATH 1710(3)
- Numerical Methods
  - ENGR 2150(4)
- Tech of Algebra
  - MATH 1210(3)
- Free Elective
  - (See Note 2 below)
- Bio Eng Design 2
  - BIEE 3900(4)
- Essentials of Microbiology
  - MBIO 1220(3)
  - or
  - MBIO 1010 (3)
- Science Elective
  - (See Note 1 below)
- Instru & Measure for Biosystems
  - BIEE 3270(4)
- Complementary Studies
  - (See Note 2 below)
- Bio Eng Design 3*
  - BIEE 4900(4)
- Statistics
  - STAT 2220(3)
- Bio Eng Design Elective
  - BIEE 4950(4)
- Engineering Economics
  - ENG 3000(3)
- Graduation Project
  - (offered in both terms)
- Bio Eng Design 4*
  - BIEE 4950(4)

Term 3
Fall
- Intro to Statics
  - ENGR 1440(3)
- Design in Engineering
  - ENG 1430(3)
- Intro to Elec & Comp Eng Techniques
  - ENGR 1450(3)
- Intro to Elec & Comp Eng Techniques
  - ENGR 1450(3)
- Fluid Mechanics
  - BIEE 2790(4)
- Bio Eng Design 1
  - BIEE 2900(4)
- Bio Eng Design 2
  - BIEE 3900(4)
- Bio Eng Design 2
  - BIEE 3900(4)
- Impact of Eng on the Enviro
  - BIEE 2480(3)
- Transport Phenomenon
  - BIEE 2110(3)
- Bio Eng Design 3*
  - BIEE 4900(4)
- Complementary Studies
  - (See Note 2 below)
- Bio Eng Design Elective
  - BIEE 4950(4)
- Science Elective
  - (See Note 1 below)

Term 4
Winter
- Fluid Mechanics
  - BIEE 2790(4)
- Bio Eng Design 1
  - BIEE 2900(4)
- Bio Eng Design 2
  - BIEE 3900(4)
- Bio Eng Design 3*
  - BIEE 4900(4)
- Bio Eng Design Elective
  - BIEE 4950(4)
- Complementary Studies
  - (See Note 2 below)
- Bio Eng Design Elective
  - BIEE 4950(4)
- Science Elective
  - (See Note 1 below)
- Statistic
  - STAT 2220(3)
- Bio Eng Design Elective
  - BIEE 4950(4)
- Engineering Economics
  - ENG 3000(3)

Term 5
Fall
- Written
  - English
  - Requirement
- Written
  - English
  - Requirement
- Computer Program for Sci & Eng
  - MATH 1510(3)
- Eng Math Analysis 1
  - MATH 2130(3)
- Intro to Math Analysis 1
  - MATH 2130(3)
- Tech of Algebra
  - MATH 1210(3)
- Bio Eng Design Elective
  - BIEE 3400(4)
- Bio Eng Design Elective
  - BIEE 3400(4)
- Physics I
  - MECH 3482(4)
- Eng Prop Biological Materials
  - BIEE 3320(4)
- Bio Design Elective
  - BIEE 3400(4)
- Inst & Measure for Biosystems
  - BIEE 3270(4)

Term 6
Winter
- Written
  - English
  - Requirement
- Written
  - English
  - Requirement
- Computer Program for Sci & Eng
  - MATH 1510(3)
- Eng Math Analysis 1
  - MATH 2130(3)
- Intro to Math Analysis 1
  - MATH 2130(3)
- Tech of Algebra
  - MATH 1210(3)
- Bio Eng Design Elective
  - BIEE 3400(4)
- Bio Eng Design Elective
  - BIEE 3400(4)
- Kinematics
  - MECH 3482(4)
- Eng Prop Biological Materials
  - BIEE 3320(4)
- Bio Design Elective
  - BIEE 3400(4)
- Inst & Measure for Biosystems
  - BIEE 3270(4)

Term 7
Fall
- Written
  - English
  - Requirement
- Written
  - English
  - Requirement
- Computer Program for Sci & Eng
  - MATH 1510(3)
- Eng Math Analysis 1
  - MATH 2130(3)
- Intro to Math Analysis 1
  - MATH 2130(3)
- Tech of Algebra
  - MATH 1210(3)
- Bio Eng Design Elective
  - BIEE 3400(4)
- Bio Eng Design Elective
  - BIEE 3400(4)
- Kinematics
  - MECH 3482(4)
- Eng Prop Biological Materials
  - BIEE 3320(4)
- Bio Design Elective
  - BIEE 3400(4)
- Inst & Measure for Biosystems
  - BIEE 3270(4)

Term 8
Winter
- Written
  - English
  - Requirement
- Written
  - English
  - Requirement
- Computer Program for Sci & Eng
  - MATH 1510(3)
- Eng Math Analysis 1
  - MATH 2130(3)
- Intro to Math Analysis 1
  - MATH 2130(3)
- Tech of Algebra
  - MATH 1210(3)
- Bio Eng Design Elective
  - BIEE 3400(4)
- Bio Eng Design Elective
  - BIEE 3400(4)
- Kinematics
  - MECH 3482(4)
- Eng Prop Biological Materials
  - BIEE 3320(4)
- Bio Design Elective
  - BIEE 3400(4)
- Inst & Measure for Biosystems
  - BIEE 3270(4)

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

*See Design Elective Information Sheet for listing of all Design Electives offered

Revised: June 17, 2022
DEPARTMENT OF BIOSYSTEMS ENGINEERING

4 YEAR MODEL PROGRAM

For students starting second year Fall 2020

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>2019</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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<tr>
<td></td>
<td></td>
<td>Complementary Studies Elective 3</td>
<td>ENG 1430 Engineering Design 3</td>
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<td>CHEM 1300 Chem 1 (CHEM 1100 &amp; 1122) 3</td>
<td>ENG 1440 Engineering Statics 3</td>
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<td>COMP 1012 Comp Prog Eng 3</td>
<td>ENG 1450 Intro Elec &amp; Comp Eng 3</td>
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<td>ENG 1460 Thermal Sciences 3</td>
<td>Written English Requirement 3</td>
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<td>MATH 1510 Applied Calculus 1 3</td>
<td>MATH 1210 C/L Algebra 3</td>
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<td>PHYS 1050 Physics 3</td>
<td>MATH 1500/1510 (p or c)</td>
<td>MATH 1710 Applied Calculus 2 3</td>
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<tr>
<th>2020</th>
<th>Pre- (p) or Co- (c) Requisites</th>
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<th>Pre- (p) or Co- (c) Requisites</th>
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<tbody>
<tr>
<td></td>
<td>ENG 1460 (p)</td>
<td>BIOE 2900 Design 1 4</td>
<td>ENG 1430 (p)</td>
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<td>CHEM 1300 or CHEM 1100 &amp; 1122(p)</td>
<td>BIOE 2800 Solid Mechanics 4</td>
<td>MATH 1710/1700 (p)</td>
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<td>ENG 1430 (p)</td>
<td>ENG 2022 Eng CAD Technology 3</td>
<td>BIOE 2900 (p)</td>
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<td>ENG 1440 (p), MATH 1710/1700 (p)</td>
<td>MECH 2150 Numerical Methods 4</td>
<td>COMP 1012 (p), MATH 2132 (c)</td>
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<td></td>
<td>CHEM 1300 or CHEM 1100 &amp; 1122(p)</td>
<td>MATH 2130 Math Analysis 1 3</td>
<td>MATH 1210 (p), MATH 1710 (p)</td>
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<td></td>
<td>ENG 1430 (p), MATH 1710/1700 (p)</td>
<td>MATH 2132 Math Analysis 2 3</td>
<td>MATH 1210 (p), MATH 1710 (p)</td>
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**ADMISSION TO BIOSYSTEMS ENGINEERING PROGRAM:** Any Preliminary Engineering courses not yet completed should be taken in Second Year if 

<table>
<thead>
<tr>
<th>SECOND YEAR 2021</th>
<th>Pre- (p) or Co- (c) Requisites</th>
<th>WINTER TERM (January)</th>
<th>Pre- (p) or Co- (c) Requisites</th>
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<tr>
<td>BIOE 3400 Des of Struc Comp Mac 4</td>
<td>BIOE 2800 (p)</td>
<td>BIOE 3270 Instrumentation for Bios 4</td>
<td>MATH 2132 (p), ENG 1450 (p)</td>
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<td>BIOE 3590 Mechanics of Biomater 4</td>
<td>BIOE 2800 (p)</td>
<td>BIOE 3320 Eng Prop of Biol Mat 4</td>
<td>MATH 2130 (p), BIOE 2800 (p)</td>
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<td>BIOE 3900 Design 2 4</td>
<td>BIOE 2900 (p), BIOE 2022</td>
<td>MECH 3482 Kinematics &amp; Dynamics 4</td>
<td>PHYS 1050 (p), BIOE 1480 (p), COMP 1012 (p), MATH 1710 (p)</td>
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<td>MBIO 1220 Essentials of Microbiolot 3</td>
<td>STAT 2220 Statistics for Engineers 3</td>
<td>MATH 1710/1700 (p)</td>
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<td>BIOE Design Elective slot (see Note 2) 4</td>
<td>BIOE Design Elective slot (see Note 2) 4</td>
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<td>Elective slot (see Note 1 below) 3/4</td>
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<tr>
<th>FOURTH YEAR 2022</th>
<th>Pre- (p) or Co- (c) Requisites</th>
<th>Elective slot (see Note 1 below) 3/4</th>
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<tr>
<td>BIOE 4900** Design 3 4</td>
<td>BIOE 3900 (p)</td>
<td>BIOE 4950** Design 4 4</td>
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<td>BIOE 4240* Graduation Project 3</td>
<td>BIOE 3270 (p)</td>
<td>BIOE 4240* Graduation Project 3</td>
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<td>BIOE Design Elective slot (see Note 2) 4</td>
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<td>Elective slot (see Note 1 below) 3/4</td>
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<tr>
<td>Elective slot (see Note 1 below) 3/4</td>
<td>ENG 3000 Engineering Economics 3</td>
<td>ANTH 2430 or ENG 3020 3</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.