DEPARTMENT OF BIOSYSTEMS ENGINEERING

4 YEAR MODEL PROGRAM

For students starting second year Fall 2018

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>2017</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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Complementary Studies Elective</td>
<td>3</td>
<td>ENG 1430 Engineering Design 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CHEM 1300 Chemistry</td>
<td>3</td>
<td>ENG 1440 Engineering Statics 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COMP 1012 Comp Prog Eng</td>
<td>3</td>
<td>ENG 1450 Intro Elec &amp; Comp Eng 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ENG 1480 Thermal Sciences</td>
<td>3</td>
<td>ENGL 1400 Lit Topics 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MATH 1510 Applied Calculus 1</td>
<td>3</td>
<td>MATH 1210 C/L Algebra 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHYS 1050 Physics</td>
<td>3</td>
<td>MATH 1510/1510 (p or c) Phys 1050 (p or c)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CHEM 1310 Chem 2 (CHEM 1110 &amp; 1120)</td>
<td>3</td>
<td>CHEM 1300 (p)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOE 2110 Transport Phenomenon</td>
<td>3</td>
<td>ENG 1460 (p)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOE 2590 Biology for Engineers</td>
<td>3</td>
<td>CHEM 1300 (p)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOE 2900 Design 1</td>
<td>4</td>
<td>ENG 1430 (p)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOE 2790 Fluid Mechanics</td>
<td>4</td>
<td>ENG 2022 Eng CAD Technology 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CHEM 1310 Chem 2 (CHEM 1110 &amp; 1120)</td>
<td>3</td>
<td>CHEM 1300 (p)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MATH 2132 Math Analysis 2</td>
<td>3</td>
<td>BIOE 2800 (p)</td>
</tr>
</tbody>
</table>

ADMISSION TO BIOSYSTEMS ENGINEERING PROGRAM: Any Preliminary Engineering courses not yet completed should be taken in Second Year if possible. The following courses must be completed by all engineering students.

SECON D YEAR 2018

FALL TERM (September) | WINTER TERM (January) | Pre- (p) or Co- (c) Requisites | Pre- (p) or Co- (c) Requisites
---|---|---|---
BIOE 2110 Transport Phenomenon 3 ENG 1460 (p) | BIOE 2800 or MECH 2222 (p) | BIOE 3270 Instrumentation for Bios 4 | MATH 2132 (p), ENG 1450 (p) |
BIOE 2590 Biology for Engineers 3 CHEM 1300 (p) | BIOE 2800 Solid Mechanics 4 | ENG 1440 (p), MATH 1710/1700 (p) |
BIOE 2900 Design 1 4 ENG 1430 (p) | BIOE 3320 Eng Prop of Biolog Mate 4 | ENG 2022 Eng CAD Technology 3 |
BIOE 2790 Fluid Mechanics 4 ENG 1440 (p), MATH 1710/1700 (p) | MECH 2150 Numerical Methods 4 | COMP 1012 (p), MATH 2132 (c) |
CHEM 1310 Chem 2 (CHEM 1110 & 1120) 3 CHEM 1300 (p) | MATH 2130 Math Analysis 1 3 | MATH 1210 (p), MATH 1710 (p) |
MATH 2132 Math Analysis 2 3 MATH 1210 (p), MATH 1710/1700 (p) | Elective slot (see note 1 below) 3/4 | MATH 1710/1700 (p) |

THIRD YEAR 2019

BIOE 3400 Des of Struc Comp Mac 4 BIOE 2800 or MECH 2222 (p) | BIOE 3270 Instrumentation for Bios 4 | MATH 2132 (p), ENG 1450 (p) |
BIOE 3590 Mechanics of Biomater 4 BIOE 2800 (p) | BIOE 3320 Eng Prop of Biolog Mate 4 | ENG 1440 (p), MATH 1710/1700 (p) |
BIOE 3900 Design 2 4 BIOE 2900 (p), BIOE 2022 | MECH 3482 Kinematics & Dynamics 4 | ENG 2022 Eng CAD Technology 3 |
MBIO 1220 Essentials of Microbiolo 3 STAT 2220 Statistics for Engineers 3 | MATH 2130 Math Analysis 1 3 | MATH 1210 (p), MATH 1710 (p) |
BIOE Design Elective slot (see Note 2) 4 | BIOE Design Elective slot (see Note 2) 4 | MATH 1710/1700 (p) |
Elective slot (see Note 1 below) 3/4 Elective slot (see Note 1 below) 3/4 | Elective slot (see Note 1 below) 3/4 |

FOURTH YEAR 2020

BIOE 4900** Design 3 4 BIOE 3900 (p) | BIOE 4950** Design 4 4 | BIOE 4900 (p) |
BIOE 4240* Graduation Project 3 BIOE 3270 (p) | BIOE 3320 Eng Prop of Biolog Mate 4 | MATH 2132 (p), ENG 1450 (p) |
BIOE Design Elective slot (see Note 2) 4 | BIOE 3270 (p) | ENG 1440 (p), MATH 1710/1700 (p) |
Elective slot (see Note 1 below) 3/4 Elective slot (see Note 1 below) 4 | ANTH 2430 or ENG 3020 3 | MATH 1710/1700 (p) |
Elective slot (see Note 1 below) 3/4 Elective slot (see Note 1 below) 3/4 | STAT 2220 3 |

*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.

Note 2: Must choose specified lists if a Specialization is desired.

(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 2510¹ 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.
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
- Written English Requirement
- Computer Program for Sci & Eng
- Applied Calculus 1
- Intro to Statics
- Fluid Mechanics

Term 2
Winter
- Intro to Kinematics & Dynamics
- Eng Prop Biological Materials
- Bio Eng Design Elective**

Term 3
Fall
- Intro to Structures
- Solid Mechanics I
- Bio Eng Design 1

Term 4
Winter
- Fluid Mechanics
- BIOE 2790(4)
- BIOE 2900(4)
- BIOE 3400(4)
- BIOE 2590(4)
- Transport Phenomenon

Term 5
Fall
- Essentials of Microbiology
- Essentials of Microbiology
- Science Elective

Term 6
Winter
- Eng Prop Biological Materials
- Bio Eng Design Elective**
- Design of Struct Comp in Machines
- Intro to Statics
- Solid Mechanics I

Term 7
Fall
- Free Elective
- Free Elective
- Graduation Project

Term 8
Winter
- Tech & Society
- Complementary Studies
- Complementary Studies (See Note 2 below)

** BioE Design Electives are typically offered in a Two-Year Rotation.

NOTE 1: Choose 2 courses
(specific courses are to be taken if completing a specialization)
- AGEC 2370 Principles of Ecology
- BIOL 1410 Anatomy of the Human Body
- BIOL 4640 Bioregenerative Applications in Medicine
- BIOL 4660 Design of Water Management System
- BIOL 4670 Principles of Biology

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

Revised: April 29, 2021