DEPARTMENT OF BIOSYSTEMS ENGINEERING

5 YEAR MODEL PROGRAM

For students starting second year Fall 2019

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>2018</th>
<th>cr hr</th>
<th>Pre- (p) or Co- (c) Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complementary Studies Elective</td>
<td>3</td>
<td>ENG 1430 Engineering Design 3</td>
</tr>
<tr>
<td>CHEM 1300 Chemistry</td>
<td>3</td>
<td>ENG 1440 Engineering Statics 3</td>
</tr>
<tr>
<td>COMP 1012 Comp Prog Eng</td>
<td>3</td>
<td>ENG 1450 Intro Elec &amp; Comp Eng 3</td>
</tr>
<tr>
<td>ENG 1460 Thermal Sciences</td>
<td>3</td>
<td>ENGL 1400 Lit Topics 3</td>
</tr>
<tr>
<td>MATH 1510 Applied Calculus 1</td>
<td>3</td>
<td>MATH 1210 C/L Algebra 3</td>
</tr>
<tr>
<td>PHYS 1050 Physics</td>
<td>3</td>
<td>MATH 1500/1510 (p or c)</td>
</tr>
</tbody>
</table>

PRELIMINARY ENGINEERING PROGRAM: Any Preliminary Engineering courses not yet completed should be taken in Second Year if possible.

SECOND YEAR FALL TERM (September) WINTER TERM (January)

<table>
<thead>
<tr>
<th>2019</th>
<th>Pre- (p) or Co- (c) Requisites</th>
<th>Pre- (p) or Co- (c) Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE 2590 Biology for Engineers</td>
<td>3</td>
<td>CHEM 1300 (p)</td>
</tr>
<tr>
<td>BIOE 2900 Design 1</td>
<td>4</td>
<td>CHEM 1300 (p)</td>
</tr>
<tr>
<td>CHEM 1310 Chem 2 (CHEM 1110 &amp; 1126)</td>
<td>3</td>
<td>CHEM 1300 (p)</td>
</tr>
<tr>
<td>MBIO 1220 Essentials of Microbiology</td>
<td>3</td>
<td>MATH 2130</td>
</tr>
</tbody>
</table>

THIRD YEAR FALL TERM 2020

<table>
<thead>
<tr>
<th>2020</th>
<th>Pre- (p) or Co- (c) Requisites</th>
<th>Pre- (p) or Co- (c) Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE 2110 Transport Phenomenon</td>
<td>3</td>
<td>ENG 1460 (p)</td>
</tr>
<tr>
<td>BIOE 2790 Fluid Mechanics</td>
<td>4</td>
<td>ENG 1440 (p), MATH 1710/1700 (p)</td>
</tr>
<tr>
<td>MATH 2130 Math Analysis 1</td>
<td>3</td>
<td>MATH 1210 (p), MATH 1710 (p)</td>
</tr>
<tr>
<td>Elective slot (see Note 1 below)</td>
<td>3/4</td>
<td>Elective slot (see Note 1 below)</td>
</tr>
</tbody>
</table>

FOURTH YEAR FALL TERM 2021

<table>
<thead>
<tr>
<th>2021</th>
<th>Pre- (p) or Co- (c) Requisites</th>
<th>Pre- (p) or Co- (c) Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE 3400 Des of Struct Comp Mac</td>
<td>4</td>
<td>BIOE 2800/MECH 2222 (p)</td>
</tr>
<tr>
<td>BIOE 3590 Mechanics of Biomater</td>
<td>4</td>
<td>BIOE 2800 (p)</td>
</tr>
<tr>
<td>BIOE 3900 Design 2</td>
<td>4</td>
<td>BIOE 2900 (p), BIOE 2022</td>
</tr>
<tr>
<td>Elective slot (see Note 1 below)</td>
<td>3/4</td>
<td>ANTH 2430 or ENG 3020</td>
</tr>
<tr>
<td>BIOE Design Elective slot (see Note 2)</td>
<td></td>
<td>BIOE Design Elective slot (see Note 2)</td>
</tr>
</tbody>
</table>

FIFTH YEAR FALL TERM 2022

<table>
<thead>
<tr>
<th>2022</th>
<th>Pre- (p) or Co- (c) Requisites</th>
<th>Pre- (p) or Co- (c) Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE 4900** Design 3</td>
<td>4</td>
<td>BIOE 3900 (p)</td>
</tr>
<tr>
<td>BIOE 4240* Graduation Project</td>
<td>3</td>
<td>BIOE 3270 (p)</td>
</tr>
<tr>
<td>BIOE Design Elective slot (see Note 2)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Elective slot (see Note 1 below)</td>
<td>3/4</td>
<td>Elective slot (see Note 1 below)</td>
</tr>
</tbody>
</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.

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 PLNT 2510* in the Fall or ANSC 3530 in the Winter of third year) and SOIL 4060 in the Winter of third year.

Environmental Specialization:

Students in the Environmental Specialization should take BIOE 2600 (alternatively AGEC 2370 in the Fall or BIOL 2300 in the Winter 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 A 10-TERM PROGRAM

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

Term 1
Fall
- PHYS 1050(3)
- Written
  English
  Requirement
- MATH 1510(3)
- COMP 1012(3)
- PHIL 1290 (3)
- Critical Thinking
  recommended

Term 2
Winter
- Intro to
  Statics
  ENG 1440(3)
- Applied
  Calculus 2
  MATH 1710(3)
- Intro to Elec
  & Comp Eng
  Techniques
  ENGR 1450(3)
- Tech of
  Algebra
  MATH 1210(3)
- Design in
  Engineering
  ENGR 1430(3)
- Bio Eng
  Design 1
  BIDE 2900(4)
- Biology
  for Engineers
  BIDE 2950(3)

Term 3
Fall
- Solid
  Mechanics I
  BIOE 2800(4)
- Bio Eng
  Design 2
  BIDE 3900(4)
- Eng Math
  Analysis 1
  MATH 2130(3)
- Numerical
  Methods
  MECH 2150(4)
- Eng CAD
  Technology
  ENG 2022(3)
- Science
  Elective
  (See Note 1
  below)

Term 4
Winter
- Fluid
  Mechanics
  BIOE 2790(4)
- Science
  Elective
  (See Note 1
  below)
- STAT 2220(3)
- Science
  Elective
  (See Note 1
  below)
- Complementary
  Studies
  (See Note 2
  below)

Term 5
Fall
- Kinematics
  & Dynamics
  MECH 3482(4)
- Biological
  Materials
  BIDE 3400(4)
- Eng Prop
  Biological
  Materials
  BIDE 3320(4)
- Instru &
  Measure for
  Biosystems
  BIDE 3270(4)
- Bio Eng
  Design 3*
  BIDE 4900(4)
- Technology
  BIDE 4900D(4)
- Biodeg Design
  Elective (4)**

Term 6
Winter
- Mechanics
  of Bio Materials
  BIOE 3590(4)
- Graduation
  Project
  (offered in both
terms)
  BIDE 4240(3)
- Bio Eng
  Design 4*
  BIDE 4950(4)
- Bio Eng
  Design 4*
  BIDE 4950(4)
- Science
  Elective
  (See Note 1
  below)

Term 7
Fall
- Free
  Elective
  (See Note 2)
- Free
  Elective
  (See Note 2)
- Engineering
  Economics
  ENGR 3000(3)
- BIODE 3320(4)
- Bio Eng
  Design Elective (4)**

Term 8
Winter
- Bio Eng
  Design Elective (4)**

Term 9
Fall
- Bio Eng
  Design 3*
  BIDE 4900(4)
- Bio Eng
  Design Elective (4)**

Term 10
Winter
- Bio Eng
  Design 4*
  BIDE 4950(4)
- Bio Eng
  Design Elective (4)**
- Bio Eng
  Design Elective (4)**
- OR
  Graduation
  Project
  (offered in both
terms)
  BIDE 4240(3)
- Bio Eng
  Design 3*
  BIDE 4900(4)
- Bio Eng
  Design Elective (4)**

NOTE 1: Choose 2 courses (specific courses are to be taken if completing a specialization)
AGEC 2370 & BIOL 2300
ANSC 3530
BIOE 2600
BIOI 1410
BIOI 1412
PLNT 2510
SOIL 4060

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

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

Revised: April 29, 2021