DEPARTMENT OF BIOSYSTEMS ENGINEERING  
5 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>
</tr>
</thead>
<tbody>
<tr>
<td>Complementary Studies Elective</td>
<td>3</td>
<td></td>
<td>ENG 1430 Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1300 Chem 1 (CHEM 1100 &amp; 1122)</td>
<td>3</td>
<td></td>
<td>ENG 1440 Engineering Statics</td>
<td>3</td>
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<tr>
<td>COMP 1012 Comp Prog Eng</td>
<td>3</td>
<td></td>
<td>ENG 1450 Intro Elec &amp; Comp Eng</td>
<td>3</td>
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<tr>
<td>ENG 1460 Thermal Sciences</td>
<td>3</td>
<td></td>
<td>ENGL 1400 Lit Topics</td>
<td>3</td>
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<tr>
<td>MATH 1510 Applied Calculus 1</td>
<td>3</td>
<td></td>
<td>MATH 1210 C/L Algebra</td>
<td>3</td>
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<tr>
<td>PHYS 1050 Physics</td>
<td>3</td>
<td>MATH 1500/1510 (p or c)</td>
<td>MATH 1710 Applied Calculus 2</td>
<td>3</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>FALL TERM (September)</th>
<th>WINTER TERM (January)</th>
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</thead>
<tbody>
<tr>
<td>THREE YEAR 2021</td>
<td></td>
</tr>
<tr>
<td>BIOE 2590 Biology for Engineers</td>
<td>3</td>
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<tr>
<td>BIOE 2900 Design 1</td>
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<tr>
<td>CHEM 1310 Chem 2 (CHEM 1110 &amp; 1126)</td>
<td>3</td>
</tr>
<tr>
<td>Mbio 1220 Essentials of Microbiol</td>
<td>3</td>
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<tr>
<td>FOURTH YEAR 2022</td>
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<tr>
<td>BIOE 2110 Transport Phenomenon</td>
<td>3</td>
</tr>
<tr>
<td>BIOE 2790 Fluid Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>MATH 2130 Math Analysis 1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3/4</td>
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<tr>
<td>BIOE Design Elective slot (see Note 2)</td>
<td>3</td>
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<tr>
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<tr>
<td>FIFTH YEAR 2023</td>
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<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></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 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 BIOI 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
- Applied Calculus 1
  - MATH 1510(3)
  - COMP 1012(3)
- Computer Program for Sci & Eng
  - MATH 1510(3)
- Complementary Studies
  - PHL 1290 (3) Critical Thinking recommended
- Chemistry 1
  - CHEM 1300(3) or CHEM 1100(3) & 1122(1.5)

Term 2
Winter
- Intro to Statics
  - ENG 1440(3)
- Applied Calculus 2
  - MATH 1710(3)
- Intro to Elec & Comp Eng Techniques
  - ENG 1450(3)
- Tech of Algebra
  - MATH 1210(3)
- Design in Engineering
  - ENG 1430(3)
- Bio Eng Design 1
  - BIDE 2900(4)
- Biology for Engineers
  - BIDE 2900(3)
- Intro to Thermal Sciences
  - ENG 1460(3)

Term 3
Fall
- Solid Mechanics I
  - BIOE 2800(4)
- Eng Math Analysis 1
  - MATH 2130(3)
- Bio Eng Design 2
  - BIDE 3900(4)
- Complementary Studies
  - (See Note 2 below)

Term 4
Winter
- Fluid Mechanics
  - BIOE 2790(4)
- Eng Math Analysis 2
  - MATH 2132(3)
- Numerical Methods
  - MECH 2150(4)
- Science Elective
  - (See Note 1 below)
- Science Elective
  - (See Note 1 below)
- OR
- Science Elective
  - (See Note 1 below)
- Eng CAD Technology
  - ENG 2022(3)
- Chemistry 2
  - CHEM 1310(3) or CHEM 1110(3) & 1126(1.5)

Term 5
Fall
- Essentials of Microbiology
  - MBIO 1220(3)
- Effects of Eng on the Enviro
  - BIOE 2480(3)
- Statistics
  - STAT 2220(3)
- Bio Eng Design 3*
  - BIOE 4900(4)
- Free Elective
  - (See Note 2)

Term 6
Winter
- Solid Mechanics I
  - BIOE 2800(4)
- Design of Struct Comp in Machines
  - BIDE 3400(4)
- Eng Prop Biological Materials
  - BIDE 3320(4)
- Instru & Measure for Biosystems
  - BIOE 3270(4)
- Science Elective
  - (See Note 1 below)
- Science Elective
  - (See Note 1 below)
- OR
- Science Elective
  - (See Note 1 below)
- Bio Eng Design 4*
  - BIOE 4950(4)

Term 7
Fall
- Kinematics & Dynamics
  - MECH 3482(4)
- Mechanics of Bio Materials
  - BIOE 3590(4)
- Design of Struct Comp in Machines
  - BIDE 3400(4)
- Eng Prop Biological Materials
  - BIDE 3320(4)
- Instru & Measure for Biosystems
  - BIOE 3270(4)
- Tech & Society
  - ANTH 2430(3) or ENG 3020(3)
- Bio Eng Design Elective (4)**
  - (offered in both terms)

Term 8
Winter
- Free Elective
  - (See Note 2)
- Engineering Economics
  - ENG 3000(3)
- Bio Eng Design Elective (4)**
- Bio Eng Design Elective (4)**

Term 9
Fall
- Free Elective
  - (See Note 2)
- Bio Eng Design Elective (4)**

Term 10
Winter
- Bio Eng Design Elective (4)**

Graduation Project (offered in both terms)
- BIOE 4240(3)

*BIOSY 4900 & 4950 must be taken in the same academic year
**See Design Elective Information Sheet for listing of all Design Electives offered

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

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

Revised: April 29, 2021

September 2020 Admits