September 2022 Admits

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

- Physics I Mechanics — PHYS 1050(3)
- Written English Requirement (3)
- Applied Calculus 1 — MATH 1510(3)
- Computer Program for Sci & Eng — COMP 1012(3)
- Complementary Studies — PHIL 1290 (3) Critical Thinking recommended
- Chemistry 1 — CHEM 1100(3) & 1122(1.5) or CHEM 1300(3)

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)
- Intro to Thermal Sciences — ENG 1460(3)

Term 3 Fall

- Essentials of Microbiology — MBIO 1220(3) or MBIO 1010 (3)
- Bio Eng Design 1 — BIOE 2900(4)
- Biology for Engineers — BIOE 2590(3)
- Chemistry 2 — CHEM 1110(3) & 1126(1.5) or CHEM 1310(3)

Term 4 Winter

- Impact of Eng on the Enviro — BIOE 2480(3)
- Statistics — STAT 2220(3)
- Eng CAD Technology — ENG 2022(3)
- Indigenous Knowledge Course (3)

Term 5 Fall

- Fluid Mechanics — BIOE 2790(4)
- Eng Math Analysis 2 — MATH 2132(3)
- Science Elective (See Note 1 below) **OR** Science Elective (See Note 1 below)
- Science Elective (See Note 1 below) **OR** Science Elective (See Note 1 below)
- Complementary Studies (See Note 2 below)

Term 6 Winter

- Solid Mechanics I — BIOE 2800(4)
- Eng Math Analysis 1 — MATH 2130(3)
- Numerical Methods — MECH 2150(4)

Term 7 Fall

- Mechanics of Bio Materials — BIOE 3590(4)
- Design of Struct Comp in Machines — BIOE 3400(4)
- Bio Eng Design 2 — BIOE 3900(4)
- Transport Phenomenon — BIOE 3110(4) or BIOE 2110(3)

Term 8 Winter

- Kinematics & Dynamics — MECH 3482(4)
- Eng Prop Biological Materials — BIOE 3320(4)
- Instru & Measure for Biosystems — BIOE 3270(4)
- Tech & Society — ANTH 2430(3) or ENG 3020(3)
- BIOE Design Elective**

Term 9 Fall

- Free Elective (See Note 2)
- BIOE Design Elective**
- Graduation Project (offered in both terms) — BIOE 4240(3)
- Bio Eng Design 3* — BIOE 4900(4)

Term 10 Winter

- Free Elective (See Note 2)
- Engineering Economics — ENG 3000(3)
- BIOE Design Elective**
- Bio Eng Design 4* — BIOE 4950(4)

→ prerequisite - - → corequisite

*BIOE 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 or 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: June 7, 2023

2022

DEPARTMENT OF BIOSYSTEMS ENGINEERING **5 YEAR MODEL PROGRAM**

For students starting second year Fall 2022
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.

	2021	cr hr	Pre- (p) or Co- (c) Requisites			cr hr	Pre- (p) or Co- (c) Requisites
Complementary Studies Elective		3		ENG 1430	Engineering Design	3	
CHEM 1300	Chem 1 (CHEM 1100 & 1122)	4.5		ENG 1440	Engineering Statics	3	
COMP 1012	Comp Prog Eng	3		ENG 1450	Intro Elec & Comp Eng	3	
ENG 1460	Thermal Sciences	3		Written English Requirement		3	
MATH 1510	Applied Calculus 1	3		MATH 1210	C/L Algebra	3	
PHYS 1050	Physics	3	MATH 1500/1510 (p or c)	MATH 1710	Applied Calculus 2	3	MATH 1500/1510 (p), PHYS 1050 (p or c)

ADMISSION TO BIOSYSTEMS ENGINEERING PROGRAM: Any Preliminary Engineering courses not yet completed should be taken in Second Year if pc

	FALL TERM (September)			WINTER TERM (January)			
SECOND YEAR	**2022**		**Pre- (p) or Co- (c) Requisites**				**Pre- (p) or Co- (c) Requisites**
BIOE 2590	Biology for Engineers	3	CHEM 1300 or CHEM 1100 & 1122(p)	BIOE 2480	Impact of Eng on Enviro	3	
BIOE 2900	Design 1	4	ENG 1430 (p)	ENG 2022	Eng CAD Technology	3	BIOE 2900 (p)
CHEM 1310	Chem 2 (CHEM 1110 & 1126)	3	CHEM 1300 or CHEM 1100 & 1122(p)	Indigenous Knowledge Course		3	
MBIO 1220	Essentials of Microbiolc	3		STAT 2220	Statistics for Engineers	3	MATH 1710/1700 (p)
THIRD YEAR	**2023**						
BIOE 2790	Fluid Mechanics	4	ENG 1440 (p), MATH 1710/1700 (p)	BIOE 2800	Solid Mechanics	4	ENG 1440 (p), MATH 1710/1700 (p)
MATH 2130	Math Analysis 1	3	MATH 1210 (p), MATH 1710 (p)	MECH 2150	Numerical Methods	4	COMP 1012 (p), MATH 2132 (c)
Elective slot (see Note 1 below)		3/4		MATH 2132	Math Analysis 2	3	MATH 1210 (p), MATH 1710/1700 (p)
Elective slot (see Note 1 below)		3/4		Elective slot (see Note 1 below)		3/4	
FOURTH YEAR	**2024**						
BIOE 2110	Transport (or BIOE 3110)	4	ENG 1460, BIOE 2790 & MECH 2150 (p)	BIOE 3270	Instrumentation for Bios	4	MATH 2132 (p), ENG 1450 (p)
BIOE 3400	Des of Struc Comp Mac	4	BIOE 2800 (p)	BIOE 3320	Eng Prop of Biolog Mate	4	MATH 2130 (p), BIOE 2800 (p)
BIOE 3590	Mechanics of Biomater	4	BIOE 2800 (p)	MECH 3482	Kinematics & Dynamics	4	PHYS 1050 (p), ENG 1440 (p), COMP 1012 (p), MATH 1710 (p)
BIOE 3900	Design 2	4	BIOE 2900 (p), BIOE 2022	ANTH 2430 or ENG 3020		3	
				BIOE Design Elective slot (see Note		4	
FIFTH YEAR	**2025**						
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 4240*	Graduation Project	3	BIOE 3270 (p)
BIOE Design Elective slot (see Note 2)		4		BIOE Design Elective slot (see Note		4	
Elective slot (see Note 1 below)		3/4		Elective slot (see Note 1 below)		3/4	
				ENG 3000	Engineering Economics	3	

†Students can alternatively choose to take MBIO 1010

*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, one 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 PLNT 2510[1] 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 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.