BIOSYSTEMS ENGINEERING, B.SC.

Degree Requirements

Program Core Courses

Note: Students are encouraged to consult the department for eight- and ten-term program models. Students are strongly encouraged to follow the model programs when possible, as timetabling and course offerings are based on these program models.

Course	Title	Hours
Students must complete the Preliminary Engineering Program requirements for graduation.		37.5
BIOE 2480	Impact of Engineering on the Environment	3
BIOE 2590	Biology for Engineers [1]	3
BIOE 2790	Fluid Mechanics	4
BIOE 2800	Solid Mechanics	4
BIOE 2900	Biosystems Engineering Design 1	4
BIOE 3110	Heat Transfer in Biological Systems	4
BIOE 3270	Instrumentation and Measurement for Biosystems	4
BIOE 3320	Engineering Properties of Biological Materials	4
BIOE 3400	Design of Structural Components in Machines	4
BIOE 3590	Mechanics of Materials in Biosystems	4
BIOE 3900	Biosystems Engineering Design 2	4
BIOE 4240	Graduation Project	3
BIOE 4900	Biosystems Engineering Design 3	4
BIOE 4950	Biosystems Engineering Design 4	4
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties [2]	3
CHEM 1126	Introduction to Chemistry Techniques for Engineering 2 [2]	1.5
ENG 2022	Engineering CAD Technology for Biosystems	3
ENG 3000	Engineering Economics	3
MATH 2130	Engineering Mathematical Analysis 1	3
MATH 2132	Engineering Mathematical Analysis 2	3
MBIO 1220	Essentials of Microbiology	3
or MBIO 1010	Microbiology I	
MECH 2150	Mechanical Engineering Modelling and Numerical Methods	4
MECH 3482	Kinematics and Dynamics	4
STAT 2220	Contemporary Statistics for Engineers	3
One course in Technology and Society (ENG 3020 or ANTH 2430)		3
One course from the List of Indigenous Knowledge Courses [3]		3
Two Science Electives (see list below)		6
Three Biosystems Engineering Design Electives		12
One Complementary Studies Electives		3
Two Free Electives		6-8
Total Hours		**154-156**

1. Please note the combination of BIOL 1020 Biology 1: Principles and Themes and BIOL 1030 Biology 2: Biological Diversity, Function and Interactions can be used in place of BIOE 2590 Biology for Engineers.
2. The former CHEM 1310 may be used in place of the combination of CHEM 1110 and CHEM 1126.
3. Students are required to take at least one of the courses from the list of Indigenous Knowledge courses.

Science Electives

Course	Title	Hours
AGEC 2370	Principles of Ecology (or the equivalent BIOL 2300)	3
ANSC 3530	The Animal and Its Environment	3
BIOL 1410	Anatomy of the Human Body	3
BIOL 1412	Physiology of the Human Body	3
PLNT 2510	Fundamentals of Horticulture	3
SOIL 4060	Physical Properties of Soils	3

Students planning to complete a specialization, should take note that there are specific courses to be used as science electives.

Biosystems Engineering Design Electives

Course	Title	Hours
BIOE 4390	Unit Operations 1	4
BIOE 4412	Design of Light-Frame Building Systems	4
BIOE 4414	Imaging and Spectroscopy for Biosystems	4
BIOE 4420	Crop Preservation	4
BIOE 4440	Bioprocessing for Biorefining	4
BIOE 4460	Air Pollution Assessment and Management	4
BIOE 4560	Structural Design in Wood	4
BIOE 4590	Management of By-Products from Animal Production	4
BIOE 4600	Design of Water Management Systems	4
BIOE 4610	Design of Assistive Technology Devices	4
BIOE 4620	Remediation Engineering	4
BIOE 4640	Bioengineering Applications in Medicine	4
BIOE 4650	Textiles in Healthcare and Medical Applications	4

Design elective courses offered vary from year to year. Courses offered in the current year are listed on the online timetables on the department website. Students planning to complete a specialization should take note that there are specific courses to be used as design electives.

Indigenous Knowledge Courses

Course	Title	Hours
INDG 1200	Indigenous Peoples in Canada	6
INDG 1220	Indigenous Peoples in Canada, Part 1	3
INDG 1240	Indigenous Peoples in Canada, Part 2	3
INDG 2012	Indigenous History in Canada	6
or HIST 2010	Indigenous History in Canada (C)	
INDG 2020	The Métis in Canada	3
or HIST 2020	The Métis in Canada (C)	
POLS 2802	Introduction to Indigenous Politics	3
ENG 4100	Contemporary Topics in Engineering Practice [1]	4

1. ENG 4100 may be used to meet this requirement when the course content satisfies the requirements of an Indigenous course.

Complementary Studies Electives

Complementary studies electives are required to give the engineering student exposure to topics outside the fields of science and engineering. Many university courses fulfill the complementary studies requirement:

- Any course at the 1000-level or above from the Faculties of Arts or Management;
- Any course at the 1000-level or above from the Department of Agribusiness and Agricultural Economics;
- Any course listed in Group C of our three specializations

ARTS 1110 may not be used for credit in the Price Faculty of Engineering. Other university courses, which do not cover topics of science or engineering, may also be acceptable. Please consult with the department head (or his/her designate) for approval of such courses. Students planning to complete a specialization, should take note that there are specific courses to be used as complementary studies electives.

Free Electives

Any university course at the 1000-level or above can be used as a free elective. However, ARTS 1110 may not be used for credit in the Price Faculty of Engineering. Students are permitted to take additional design electives or engineering courses from other departments to fulfill free elective requirements. Students planning to complete a specialization, should take note that there are specific courses to be used as free electives.