



Bringing Skills to Life

Biological Engineering students at the University of Guelph combine their knowledge of life sciences with engineering principles to design and control biological processes and systems. They work independently and in multi-disciplinary teams, with the aim of enriching our lives and maintaining a sustainable environment. Students learn the foundations and build on the skills necessary to positively impact industrial process design and quality control in the agriculture, environmental, food and pharmaceutical sectors.

University of Guelph Advantage

Guelph's cutting-edge Biological Engineering program focuses on core engineering skills along with fundamentals in bioreactor design, biomaterial science, biosystems analysis, instrumentation and digital control. Students have the option to specialize their degree through elective courses in the areas of bioprocessing, biological, and environmental waste management, human factors and food engineering.

In addition to core engineering analysis and design, students can elect to tailor their education through courses focusing on:

- Processing biological materials
- Unit operation, analysis and design
- Bio-instrumentation design
- Computer applications
- Interfacing hardware
- Software for data acquisition, modeling and control
- Biomechanics

Co-op students are available for 4 or 8 month work terms.

Student Strengths

- Strong wet and dry laboratory techniques and computing skills
- Fundamental knowledge of engineering concepts, as well as physical, mathematical and biological sciences
- Strong independent research skills developed through the design process, management and financial feasibility analysis
- Participation in design groups to develop effective problem solving, communication and teamwork skills

Biological Engineering Course Sequencing

YEAR	FALL (SEPT-DEC)	WINTER (JAN-APRIL)	SUMMER (MAY-AUG)
ONE	<ul style="list-style-type: none"> • GENERAL CHEMISTRY I • ENGINEERING AND DESIGN I • CALCULUS I • ENGINEERING ANALYSIS • PHYSICS WITH APPLICATIONS 	<ul style="list-style-type: none"> • INTRODUCTION TO PROGRAMMING • GENERAL CHEMISTRY II • CALCULUS II • ENGINEERING MECHANICS I • INTRODUCTORY ELECTRICITY AND MAGNETISM 	OFF
TWO	<ul style="list-style-type: none"> • FLUID MECHANICS • BIOLOGICAL CONCEPTS OF HEALTH • ENGINEERING SYSTEMS ANALYSIS • APPLIED DIFFERENTIAL EQUATIONS • INTRODUCTION TO CO-OPERATIVE EDUCATION • PROBABILITY AND STATISTICS FOR ENGINEERS • ONE OF: DISCOVERING BIODIVERSITY OR INTRODUCTION TO MOLECULAR AND CELLULAR BIOLOGY 	<ul style="list-style-type: none"> • INTRODUCTION TO BIOCHEMISTRY • MATERIAL SCIENCE • ELECTRIC CIRCUITS • BIOLOGICAL ENGINEERING SYSTEMS I • NUMERICAL METHODS • ENGINEERING AND DESIGN II 	WORK TERM ONE
THREE	<ul style="list-style-type: none"> • BIOLOGICAL ENGINEERING SYSTEMS II • SCIENCE AND TECHNOLOGY IN A GLOBAL CONTEXT • THERMODYNAMICS • ELECTRONIC DEVICES • BIO-PROCESS ENGINEERING • 1 RESTRICTED ELECTIVE 	WORK TERM TWO	WORK TERM THREE
FOUR	<ul style="list-style-type: none"> • BIO-INSTRUMENTATION DESIGN • ENGINEERING ECONOMICS • BIOREACTOR DESIGN • 2 RESTRICTED ELECTIVES 	<ul style="list-style-type: none"> • ENGINEERING AND DESIGN III • PROCESS CONTROL • HEAT AND MASS TRANSFER • BIOMATERIALS • 2 RESTRICTED ELECTIVES 	WORK TERM FOUR
FIVE	WORK TERM FIVE	<ul style="list-style-type: none"> • BIOLOGICAL ENGINEERING DESIGN IV • 3-4 RESTRICTED ELECTIVES 	

BASED ON THE 2022/23 UNDERGRADUATE CALENDAR

PLEASE SEE THE CURRENT UNDERGRADUATE CALENDAR FOR MORE INFORMATION