



## Bringing Skills to Life

Biomedical Engineering students at the University of Guelph combine their knowledge of life sciences with engineering principles to the design, development, and application of electronic and biomedical devices to improve human health. Students who study biomedical engineering help meet the growing need for the application of mechanics, materials and physiology to develop devices such as prosthetics and implants and for investigative instruments and technologies. Students also learn skills that would lead to industrial process design and quality control in the healthcare sector.

## University of Guelph Advantage

While gaining the background necessary to excel in the biomedical industry, students have the option to specialize their degree through elective courses in the areas of image processing, electronic instrumentation and electrical devices, human factors or pharmaceuticals. The Biomedical Engineering program is focused on biomaterial science, biomechanics, process engineering, and instrumentation and digital control.

In addition to core engineering analysis and design courses, all students will study:

- Material Science
- Physiology, Anatomy, and Pathology
- Bio-instrumentation design
- Computer-aided design
- Computer systems interfacing
- Systems analysis
- Biomechanics

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

## Student Strengths

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

# Biomedical Engineering Course Sequencing

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

BASED ON THE 2021/22 UNDERGRADUATE CALENDAR

PLEASE SEE THE CURRENT UNDERGRADUATE CALENDAR FOR MORE INFORMATION