

BASC BIOMEDICAL MECHANICAL ENGINEERING AND BSC COMPUTING TECHNOLOGY

The purpose of the Biomedical Mechanical Engineering program is to graduate engineers proficient in the areas of biomedical engineering related to mechanical engineering. These include the design of medical devices such as artificial hearts, implants and prostheses, the development and selection of bio-compatible metallic and non-metallic materials for implants and medical equipment, robotics for medical applications, biomechanics and rehabilitation engineering.

The program structure parallels that of the regular Mechanical Engineering program, replacing eight courses in the regular program with biomedically-oriented courses.

This program has a broad scope, so that graduates may have a wide range of career choices, not only in the biomedical field but also in conventional mechanical engineering. Biomedical systems are among the most complex of mechanical systems; therefore, a strong and comprehensive education in standard mechanical engineering principles is provided, with emphasis on their application in biomedical systems.

This program is offered in English and in French.

French courses are available in first year and almost all of second year. Most third and fourth year courses are offered in English only.

Learn more about this program (<https://www.uottawa.ca/faculty-engineering/undergraduate-studies/programs/biomedical-mechanical/>)

Program Requirements

Co-operative education is available with this program.

Requirements for this program have been modified. Please consult the 2025-2026 calendars (<http://www.uottawa.ca/academic/info/regist/1516/calendars/>) for the previous requirements.

Compulsory First-Year Courses:

ANP 1111	Essentials of Human Anatomy and Physiology I	3 Units
CHM 1311	Principles of Chemistry	3 Units
ENG 1112	Technical Report Writing	3 Units
GNG 1105	Engineering Mechanics	3 Units
ITI 1100	Digital Systems I	3 Units
ITI 1120	Introduction to Computing I ¹	3 Units
ITI 1121	Introduction to Computing II	3 Units
MAT 1320	Calculus I	3 Units
MAT 1322	Calculus II	3 Units
MAT 1341	Introduction to Linear Algebra	3 Units
MAT 1348	Discrete Mathematics for Computing	3 Units
MCG 1102	Mechanical Drafting	2 Units
MCG 1103	Fundamentals of Biomedical Mechanical Engineering	1 Unit
PHY 1122	Fundamentals of Physics II	3 Units

Compulsory Second-Year Courses:

CEG 2136	Computer Architecture I	3 Units
CSI 2110	Data Structures and Algorithms	3 Units
CSI 2120	Programming Paradigms	3 Units
CSI 2372	Advanced Programming Concepts With C++	3 Units
CVG 2140	Mechanics of Materials I	3 Units
ELG 2336	Electric Circuits and Machines for Mechanical Engineering	3 Units
GNG 2101	Introduction to Product Development for Engineers and Computer Scientists	3 Units
MAT 2322	Calculus III for Engineers	3 Units
MAT 2384	Ordinary Differential Equations and Numerical Methods	3 Units
MCG 2101	Introduction to Design of Mechanical Systems	3 Units
MCG 2108	Dynamics	3 Units
MCG 2130	Thermodynamics I	3 Units
MCG 2131	Thermodynamics II	3 Units
MCG 2142	Biological and Engineering Materials II	3 Units
MCG 2360	Engineering Materials I	3 Units
PHI 2396	Bioethics	3 Units
STA 2391	Probability and Statistics for Engineers	3 Units

Compulsory Third-Year Courses:

CEG 3136	Computer Architecture II	3 Units
CSI 3131	Operating Systems	3 Units
ELG 3336	Electronics for Mechanical Engineers	3 Units
MAT 3320	Mathematics for Engineers	3 Units
MCG 3110	Heat Transfer	3 Units
MCG 3131	Machine Design	3 Units
MCG 3139	Biofluid Mechanics I	3 Units
MCG 3141	Advanced Strength of Materials and Applications to Biomechanical Systems	3 Units
MCG 3143	Biofluid Mechanics	3 Units
MCG 3153	Introduction to Biomechanics of Human Movement	3 Units
MCG 3305	Biomedical System Dynamics	3 Units
MCG 3307	Control Systems	3 Units

Compulsory Fourth-Year Courses:

3 course units from:		3 Units
GNG 4120	Technology Entrepreneurship for Engineers and Computer Scientists	
HIS 2129	Technology, Society and Environment Since 1850	
PHI 2394	Scientific Thought and Social Values	
GNG 4170	Engineering Law	3 Units
MCG 4308	Mechanical Vibration Analysis	3 Units
MCG 4328	Manufacturing	3 Units
MCG 4340	Mechanical Engineering Laboratory	3 Units
MCG 4366	Biomedical Mechanical Engineering Capstone Project	6 Units
6 course units from:		6 Units
MCG 4112	Introduction to Microfluidics	
MCG 4151	Design of Artificial Joint Prostheses and Implants	

This is a copy of the 2026-2027 catalog.

MCG 4152 Design of Artificial Organs	
MCG 4153 Biomechanics of Movement	
MCG 4154 Introduction to Biomaterials and Tissue Engineering	
6 technical electives units in mechanical engineering (MCG) at the 4000 level selected from the optional courses listed under the BAsC in Mechanical Engineering program	6 Units
3 course units from computer science (CSI), software engineering (SEG) or computer engineering (CEG) at the 2000, 3000 or 4000 level	3 Units
Total:	162 Units

MCG 4142 Corrosion: Principles, Prevention and Control	3 Units
MCG 4143 Product Design and Development	3 Units
MCG 4144 Introduction to Composite Materials	3 Units
MCG 4190 Selected Topics I	3 Units
MCG 4191 Selected Topics II	3 Units
MCG 4192 Selected Topics III	3 Units
MCG 4193 Selected Topics IV	3 Units
MCG 4220 Thesis	6 Units

Note(s)

¹ This course replaces GNG 1106 in the BAsC in Biomedical Mechanical Engineering, for the purpose of the double degree, BAsC in Biomedical Mechanical Engineering and BSc in Computing Technology.

List of Optional Courses

Stream A: Fluid Mechanics - Heat Transfer:

MCG 4104 Building Energy Systems	3 Units
MCG 4110 Fluid Machinery	3 Units
MCG 4111 Internal Combustion Engines	3 Units
MCG 4126 Energy Conversion	3 Units
MCG 4128 Basic Nuclear Engineering	3 Units
MCG 4139 Computational Methods in Fluid and Heat Transfer	3 Units
MCG 4325 Gas Dynamics	3 Units
MCG 4345 Aerodynamics	3 Units

Stream B: Solid Mechanics - Design and Synthesis:

MCG 4102 Finite Element Analysis	3 Units
MCG 4107 Dynamics II	3 Units
MCG 4127 Computational Methods in Mechanical Engineering	3 Units
MCG 4155 Advanced Engineering Materials	3 Units
MCG 4329 Reliability and Maintainability in Engineering Design	3 Units

Stream C: CAD/CAM - Industrial Engineering:

MCG 4130 Industrial Planning	3 Units
MCG 4132 Robot Mechanics	3 Units
MCG 4133 Automation Design and Control	3 Units
MCG 4134 Robot Design and Control	3 Units
MCG 4136 Mechatronics	3 Units

Stream D: Biomedical

MCG 4112 Introduction to Microfluidics	3 Units
MCG 4150 Bioinstrumentation	3 Units
MCG 4151 Design of Artificial Joint Prostheses and Implants	3 Units
MCG 4152 Design of Artificial Organs	3 Units
MCG 4153 Biomechanics of Movement	3 Units
MCG 4154 Introduction to Biomaterials and Tissue Engineering	3 Units

Other Technical Electives:

MCG 4100 Thesis	6 Units
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