BIOLOGICAL AND BIOMEDICAL ENGINEERING (THESIS) (M.SC.) (45 CREDITS)

Offered by: Biological & Biomedical Engr (Faculty of Medicine and Health Sciences)
Degree: Master of Science
Program credit weight: 45

Program Description

The Biological and Biomedical Engineering (BBME) Master's program focuses on the interdisciplinary application of methods, paradigms, technologies, and devices from engineering and the natural sciences to problems in biology, medicine, and the life sciences. With its unique multidisciplinary environment, and taking advantage of research collaborations between staff in the Faculties of Medicine, Science, and Engineering. BBME offers thesis-based graduate degrees (M.Sc.) that span broad themes in biomodelling, biosignal processing, medical imaging, nanotechnology, artificial cells and organs, probiotics, bioinformatics, bioengineering, biomaterials, and orthopaedics. BBME's internationally renowned staff provide frequent and stimulating interactions with physicians, scientists, and the biomedical industry. Through courses and thesis research, this program will prepare students for careers in industry, academia, hospitals and government and provide a solid basis for Ph.D. studies. Candidates should hold a bachelor's degree in engineering, science, or medicine with a strong emphasis on mathematics, physics, chemistry, and basic physiology or cell biology.

Note: For information about Fall 2025 and Winter 2026 course offerings, please check back on May 8, 2025. Until then, the "Terms offered" field will appear blank for most courses while the class schedule is being finalized.

Thesis Courses (30 credits)

Expand allContract all

Course	Title	Credits
BBME 693	Thesis Research 1.	6
BBME 694	Thesis Research 2.	6
BBME 695	Thesis Submission.	12
BBME 696	Thesis Research 3.	3
BBME 697	Thesis Research 4.	3

Required Courses (3 credits)

Expand allContract all

Course	Title	Credits
BBME 600D1	Seminars in Biological and Biomedical Engineering.	1.5
BBME 600D2	Seminars in Biological and Biomedical Engineering.	1.5

OR

Expand allContract all

Course	Title	Credits
BBME 600N1	Seminars in Biological and Biomedical Engineering.	1.5
BBME 600N2	Seminars in Biological and Biomedical Engineering.	1.5

Complementary Courses (12 credits)

3 credits from the following quantitative courses:

Expand allContract all

Course	Title	Credits
BIEN 510	Engineered Nanomaterials for Biomedical Applications.	3
BIEN 530	Imaging and Bioanalytical Instrumentation.	3
BIEN 550	Biomolecular Devices.	3
BIEN 560	Design of Biosensors.	3
BIEN 570	Active Mechanics in Biology.	3
BIEN 590	Cell Culture Engineering.	3
BMDE 502	BME Modelling and Identification.	3
BMDE 503	Biomedical Instrumentation.	3
BMDE 512	Finite-Element Modelling in Biomedical Engineering.	3
BMDE 519	Biomedical Signals and Systems.	3
BMDE 610	Functional Neuroimaging Fusion.	3
BMDE 660	Advanced MR Imaging and Spectroscopy of the Brain.	3
MDPH 607	Medical Imaging.	3

3 credits from the following:

Expand allContract all

Course	Title	Credits
BIEN 510	Engineered Nanomaterials for Biomedical Applications.	3
BIEN 530	Imaging and Bioanalytical Instrumentation.	3
BIEN 540	Information Storage and Processing in Biological Systems.	3
BIEN 550	Biomolecular Devices.	3
BIEN 560	Design of Biosensors.	3
BIEN 570	Active Mechanics in Biology.	3
BIEN 590	Cell Culture Engineering.	3
BIEN 680	Bioprocessing of Vaccines.	4
BMDE 501	Selected Topics in Biomedical Engineering.	3
BMDE 502	BME Modelling and Identification.	3
BMDE 503	Biomedical Instrumentation.	3
BMDE 504	Biomaterials and Bioperformance.	3
BMDE 505	Cell and Tissue Engineering.	3

BMDE 508	Introduction to Micro and Nano-Bioengineering.	3
BMDE 512	Finite-Element Modelling in Biomedical Engineering.	3
BMDE 519	Biomedical Signals and Systems.	3
BMDE 525D1	Design of Assistive Technologies: Principles and Praxis.	3
BMDE 525D2	Design of Assistive Technologies: Principles and Praxis.	3
BMDE 610	Functional Neuroimaging Fusion.	3
BMDE 650	Advanced Medical Imaging.	3
BMDE 654	Biomedical Regulatory Affairs - Medical Devices.	3
BMDE 660	Advanced MR Imaging and Spectroscopy of the Brain.	3
MDPH 607	Medical Imaging.	3

6 credits at the 500-level or higher chosen from a list on the program web site https://www.mcgill.ca/bbme/students/courses or from other courses, at the 500 level or higher, at least 3 credits of which have both life sciences content and content from the physical sciences, engineering, or computer science, with the prior written approval of the Thesis Supervisor and the Graduate Program Director.