

Bachelor of Engineering

BIOENGINEERING

B.ENG. (BIOENG)

What is Bioengineering?

Bioengineering draws upon the sophistication of living systems as an inspiration and tool to design and create. It is a rapidly-growing discipline covering a broad range of topics, such as materials science and tissue engineering, biomedical devices and instrumentation, molecular and cellular engineering, as well as environmental engineering.



Is this the program for me?

Bioengineering is unique in that it couples fundamental engineering principles with biology. As a result, bioengineers come to acquire a solid background in math, physics, and chemistry.

Bioengineers are naturally curious about the remarkable complexity of living organisms, and constantly seek to improve current state-of-the-art technology. Most importantly, bioengineers enjoy both learning about fundamental concepts and working in laboratories.

What kinds of courses do students take?

In their first year, students take general science courses in math, chemistry, physics, and biology. Quebec CEGEP students typically receive one-year advanced standing. In subsequent years, students take more specialized courses related to biomaterials, biophysics, biocomputation, nanotechnology, imaging, instrumentation, and biosensors, as well as lab courses that include both dry and wet lab work.

Why McGill?

McGill's Bioengineering undergraduate program is one of the very few undergraduate degrees of its kind offered in Canada and is the only program that places emphasis on providing solid foundations in both engineering and biology principles. Students greatly benefit from the opportunity of studying in a highly multidisciplinary environment and being exposed to different concepts.

For further information

- **Faculty of Engineering**
www.mcgill.ca/engineering
- **Department of Bioengineering**
www.mcgill.ca/bioengineering
- **Joint Graduate Program in Biological and Biomedical Engineering**
www.mcgill.ca/bbme

How do I apply?

Admissions information:

www.mcgill.ca/engineering/future-students/how-apply



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What can I do when I graduate?

Bioengineers can work in various and diverse fields, including the pharmaceutical, medical device, healthcare, bio-energy, and agricultural biotechnology sectors. In addition to working in industrial research & development, there are many exciting opportunities for graduate studies in a variety of fields (Engineering, Biology, Physiology, Neuroscience) at McGill or elsewhere. As bioengineers obtain the complementary skills needed to be good project managers through their studies, they may also move into management and executive positions.

According to the U.S. Bureau of Labor Statistics, employment for Biomedical Engineers is expected to increase by 27%, compared to 9% for all engineering disciplines. Québec in particular has by far the highest ratio of internationally trained professionals working in the bio-related economy – 60%, compared to 30-40% for the rest of Canada – and it also has the highest percentage of gross domestic product (GDP) associated with the bio-based economy. Therefore, there is a need for specialized bioengineering graduates within Québec to work in its thriving bio-related sector.

Examples of bio-related industries with facilities in Québec include (but are not limited to):

- Pfizer
- Merck
- Sanofi
- Becton Dickinson
- Medtronic
- Elekta
- Nobel Biocare

Industries

The size of the bio-based economy in Canada overall is similar to that of the automotive industry, slightly lower than the oil and gas industry, and roughly six times the size of the aerospace industry. Bioengineers are involved in several diverse topics, such as fabricating novel biomaterials with desirable mechanical properties for a variety of applications (dentistry, prostheses, artificial organs), designing and developing the new generation of medical devices and biosensors, developing patient-specific therapeutic approaches using nanostructures and microfluidics, analyzing the genetic code and using it for achieving improved therapies, as well as developing more efficient energy production methods from biological sources. Some common industries that require bioengineers are:

- Pharmaceuticals
- Medical Devices
- Healthcare

- Energy
- Agricultural
- Engineering Consulting
- Finance & Insurance
- Government
- Scientific & Technical Services

Useful Resources

- **McGill Engineering Student Affairs Office**
Housed in the Engineering Student Centre; Academic Advisors are available to provide assistance and information on program planning and academic success.
- **McGill Engineering Career Centre (ECC)**
Career advising, resources, information, job postings and links for engineering students
- **myFuture**
Job postings for McGill students
- **The Engineering Institute of Canada**
Engineering Career Network

Student Life

McGill provides several opportunities to participate in a variety of clubs, activities, and student government. Getting involved in a club or other group is a great way to meet people and build your résumé.

- **Biomedical Engineering Student Society (BMESS)**
www.bme.mcgill.ca/bmess
- **Engineering Undergraduate Society (EUS)**
www.mcgilleus.ca
- **Engineers Without Borders – McGill Chapter**
www.mcgill.ewb.ca
- **Promoting Opportunities for Women in Engineering (POWE)**
www.mcgill.ca/engineering/current-students/undergraduate/student-life/powe



Contact Us

McGill Engineering Student Centre (MESC)

Student Affairs Office, Career Centre,
Peer Tutoring Services
Frank Dawson Adams Building
Room 22
3450 University Street
Montreal, Quebec H3A 0E8

Student Affairs Office (SAO)

Telephone: 514-398-7257
Email: info.faceng@mcgill.ca
www.mcgill.ca/engineering/current-students/undergraduate/mesc

Engineering Career Centre (ECC)

Telephone: 514-398-8100
Email: careers4engineers@mcgill.ca
www.mcgill.ca/careers4engineers



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