Bachelor of Engineering
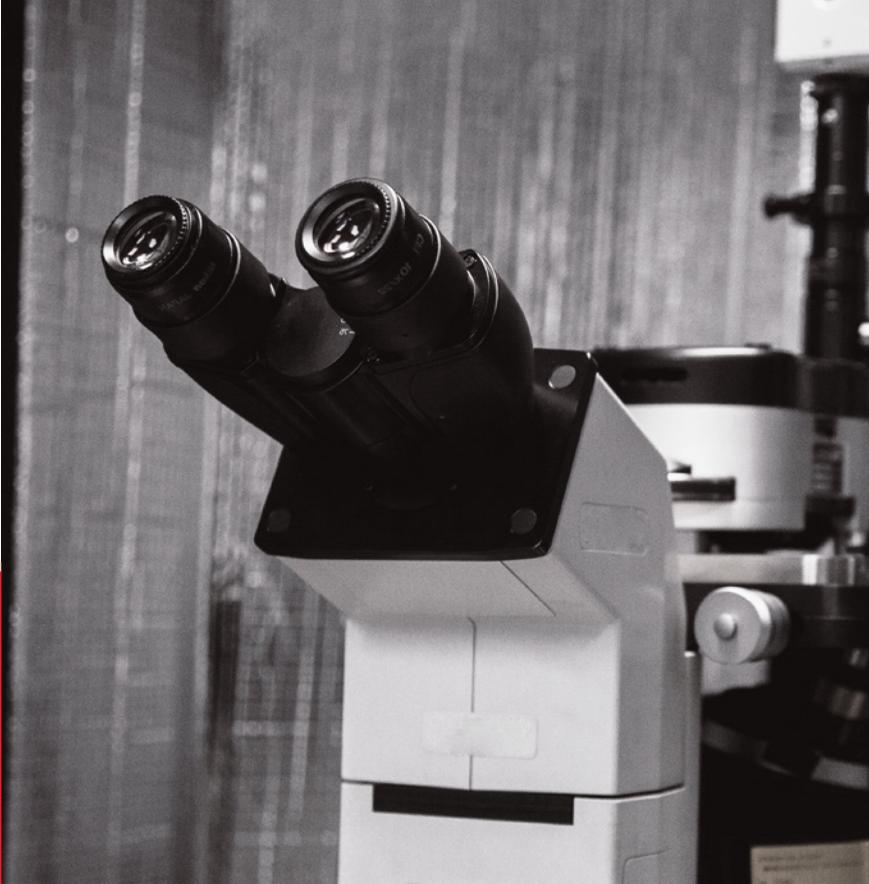## Bioengineering

What is **bioengineering?**

Bioengineering draws upon the sophistication of living systems as an inspiration, and as a 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 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.

Coursework **and research areas**

The first year includes general science courses in math, chemistry, physics, and biology. Québec 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 which include both dry and wet lab work.

Why **McGill?**

McGill's Undergraduate Program in Bioengineering 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 benefit greatly from the opportunity of studying in a highly multidisciplinary environment and being exposed to various concepts.

How do **I apply?**

Admissions information:

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

McGill | Faculty of Engineering

Prof. Dan V. Nicolau
Chair, Department of
Bioengineering

Prof. Dan V. Nicolau is the Chair of the Department of Bioengineering, Marika Zelenka-Roy Chair in Bioengineering, Fellow of the Society of International Society of Optics and Photonics (SPIE), Editor in Chief of IEEE Transactions on NanoBioScience, and Founder of Molecular Sense Ltd (UK). Dan worked in industry, government research institutes, and academia in electrical and semiconductor engineering, mining, and diagnostics and high throughput screening biomedical devices in Europe, Australia, Japan, the UK, and Canada. His expertise spans from surface phenomena involving biomolecules and cell for biomedical micro- and nano-devices, including those using protein molecular motors, biomolecular modelling and simulation, and more recently, biocomputation using bacteria and fungi in microfluidic devices.

MADE
by McGill

What can I do
when I graduate?

Bioengineers can work in numerous and diverse fields, including the pharmaceutical, medical device, healthcare, bio-energy, and agricultural biotechnology sectors. In addition to working in industrial research and 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

Student life
and engagement

The Faculty of Engineering provides several opportunities to participate in a variety of clubs, activities, and student government. Below are a few groups students can join to connect with others and enhance their life outside of the classroom:

▲ Bioengineering Undergraduate Student Society (BUSS)

▲ Engineering Undergraduate Society (EUS)

▲ Engineers Without Borders – McGill Chapter

▲ Promoting Opportunities for Women in Engineering (POWE)

Contact us

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