CHEMICAL ENGINEERING

About the Department of Chemical Engineering

Chemical engineering at McGill University offers a comprehensive education grounded in physics, mathematics, and chemistry, with opportunities to explore biology through courses relevant to bioprocessing, biopharmaceuticals, food, and environmental engineering. The curriculum emphasizes engineering fundamentals, design principles, and the economics of process industries, while also developing essential skills in experimental design, project management, teamwork, and communication. Students gain practical experience through process design courses taught by practicing engineers, preparing them to solve technological problems and meet societal needs. This program may equip students with the knowledge and skills to work in diverse and impactful jobs.

Chemical engineers often work in industries such as:

- chemical and materials manufacturing
- energy systems
- water treatment
- food processing
- biochemical and pharmaceutical industries

The technological problems and opportunities in these industries are often closely linked to social, economic, and environmental concerns. For this reason, chemical engineers often deal with these questions while working in process and product development, equipment design, and managerial positions.

By means of complementary courses, students can also obtain further depth in technical areas and breadth in non-technical subjects. Some students elect to complete a minor in biotechnology, nanotechnology, management, materials engineering, computer science, environmental engineering, chemistry, or another minor (see Minor Programs for minors available to engineering students).

The solution to many environmental problems requires an understanding of technological principles; a Chemical Engineering degree provides an ideal background. In addition to relevant material learned in the core program, a selection of environmental complementary courses and minor programs is available. The involvement of many Chemical Engineering faculty members in environmental research provides the opportunity for undergraduate students to carry out research projects in this area.

The B.Eng. curriculum also provides the preparation necessary to undertake postgraduate studies leading to M.Eng., M.Sc., or Ph.D. degrees in Chemical Engineering. Students completing this curriculum acquire a broad, balanced education in the natural sciences with the accent on application. Thus, for those who do not continue in Chemical Engineering, it provides an exceptionally balanced education in applied science. For others, it will form the basis of an educational program that may continue with a variety of studies such as business administration, medicine, or law. Versatility is, therefore, one of the most valuable characteristics of Chemical Engineering program graduates.

Academic Programs

The Chemical Engineering program comprises 143 credits (114 credits for those who completed the Quebec CEGEP program in Pure and Applied Sciences).

Students must obtain a grade of C or better in all core courses. For the Department of Chemical Engineering, core courses include all required courses (departmental and non-departmental) as well as technical complementary courses.

Canadian Society for Chemical Engineering

The Chemical Engineering Student Society has for many years been affiliated with both the CSChE (Canadian Society for Chemical Engineering) which is one of the member societies of the Chemical Institute of Canada (CIC) and with the AIChE (American Institute of Chemical Engineers). CSChE membership is free for all full-time undergraduate students at McGill. CSChE and AIChE members gain access to a range of benefits, including registration rates at the Canadian Chemical Engineering Conference, as well as member rates in the American Chemical Society (ACS) and affiliated events. The student chapter also organizes a series of local social, educational, and sporting events. Recent events have included student–professor banquets, parties, speakers, broomball games, and joint events with the Montreal Section of the CIC, which gives students a chance to network with practising chemical engineers in the Montreal region.

Available Programs

- Chemical Engineering (B.Eng.) (143 credits)

More about B.Eng. Degree in Chemical Engineering

Courses CHEE 582 Polymer Science and Engineering. and CHEE 584 Polymer Processing. comprise a **Polymeric Materials** course sequence, while courses CHEE 380 Materials Science. and CHEE 484 Materials Engineering. present fundamental aspects of materials science and engineering, respectively. Additional courses in the polymer materials area are available in the Chemistry Department (e.g., CHEM 574 Introductory Polymer Chemistry.). The Department has considerable expertise in the polymer area.

Courses CHEE 370 Elements of Biotechnology. and CHEE 474 Biochemical Engineering. make up a sequence in **Biochemical Engineering and Biotechnology**. Students interested in this area may take additional courses, particularly those offered by the Bioengineering (Faculty of Engineering); by the Department of Food Science and Agricultural Chemistry (Faculty of Agricultural and Environmental Sciences); and courses in biochemistry and microbiology. The food, beverage, and pharmaceutical industries are large industries in the Montreal area, and these courses are relevant to these industries and to the new high-technology applications of biotechnology.

A third sequence of courses is offered in **Energy**, comprising CHEE 400 Principles of Sustainable Energy Conversion. Principles of Energy Conversion and CHEE 401 Energy Systems Engineering. Energy Systems Engineering. Additional courses that offer topics related to energy are CHEE 511 Catalysis for Sustainable Fuels

and Chemicals. Catalysis for Sustainable Fuels and Chemicals and CHEE 541 Electrochemical Engineering. Electrochemical Engineering.

The fourth area in which there is a sequence of courses is **Pollution Control**. The Department offers three courses in this area: CHEE 521 Nanomaterials and the Aquatic Environment., CHEE 591 Environmental Bioremediation., and CHEE 593 Industrial Water Pollution Control.. As some water pollution control problems are solved by microbial processes, course CHEE 474 Biochemical Engineering. is also relevant to the pollution control area. Additional courses in this area are listed in the Bachelor of Engineering (B.Eng.) - Minor Environmental Engineering (21 credits).

A Minor in Biotechnology is also offered by the Faculties of Engineering and Science with emphasis on molecular biology and chemical engineering processes. A full description of the program appears in the Bachelor of Engineering (B.Eng.) - Biotechnology Minor (for Engineering Students) (B.Eng.) (24 credits).

Note: Many of the technical complementaries are offered only in alternate years. Students should, therefore, plan their complementaries as far ahead as possible. With the approval of the instructor and Academic Adviser, students may take graduate (600-level) CHEE courses as technical complementaries.

Location

M.H. Wong Building, Room 3060
3610 University Street
Montreal QC H3A 0C5
Telephone: 514-398-4494
Fax: 514-398-6678
Email: ugrad.chemeng@mcgill.ca
Website: mcgill.ca/chemeng