



# Civil Engineering



Building a better  
**future**



McGill

# McGill University

Set in the heart of  
downtown Montreal



Montreal, with a population of over 3 million, is consistently listed as one of the most liveable cities in the world. It's alive yet safe, stunning, yet affordable, and above all, a fun place to live and study. With Mount Royal as a backdrop, McGill's main campus is set in the heart of downtown Montreal. The campus is a mosaic of historic and modern buildings laid out around an oasis of green space. Much like the multicultural population of Montreal, McGill's 31,000 students include people from 138 countries.

The department offers an accredited Bachelor of Engineering degree to undergraduate students. During this course of study, students may elect to spend a year at a foreign university or can obtain in-depth practical and professional experience through the Internship Year in Engineering and Science (IYES) program. For students who wish to continue their studies, Masters and Doctoral degrees can be obtained at the graduate level.

*Below right:  
The McGill  
Spiderboggan,  
concrete toboggan  
race '98.*



**THE DEPARTMENT OFFERS  
AN ACCREDITED BACHELOR OF  
ENGINEERING DEGREE TO  
UNDERGRADUATE STUDENTS**

PHOTOS TAKEN BY  
JACK GOLDSMITH  
AND CIVIL ENGINEERING  
STAFF AND STUDENTS

CREDIT FOR TOP, RIGHT  
COVER PHOTO:  
MINISTÈRE DES  
TRANSPORTS -  
DIRECTION DE  
L'ÎLE-DE-MONTRÉAL



## Changing face of

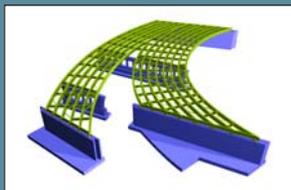
# Civil Engineering

Civil engineers use and develop modern technologies to meet the needs of our changing society. Concerns for environmental quality, energy conservation, infrastructure restoration, and public safety now shape the role of practicing engineers. The introduction of advanced materials, as well as computer-aided and communication-based technologies for planning, design and management are changing the ways engineers practice. Civil engineers maintain their long-standing tradition of environmental protection through water and waste treatment, but today they also focus on areas such as ecosystem restoration, waste reduction, climate change impact mitigation and air pollution abatement.

## You choose

- 5 COURSES ARE CHOSEN TOWARDS SPECIALIZATION IN ANY OF THE AREAS OF CIVIL ENGINEERING.
- MINOR PROGRAMS ARE AVAILABLE IN AREAS SUCH AS ARTS, CONSTRUCTION PROJECT MANAGEMENT, ENVIRONMENTAL ENGINEERING, MANAGEMENT, AND SOFTWARE ENGINEERING.
- PROGRAMS FOR STUDYING ABROAD ARE AVAILABLE AT MANY LEADING OVERSEAS INSTITUTIONS.

3-D model of  
L'Acadie/Autoroute  
40 Interchange,  
Photo Courtesy of  
SNC-Lavalin Inc.



## ENVIRONMENTAL ENGINEERING

*Egg-shaped biosolids digesters at a large municipal wastewater treatment plant.*



Environmental Engineers ensure that the use of water, land, and air resources are sustainable, and that environmental pollution and degradation is minimized. They develop the technical solutions needed to solve or control water, soil and air pollution problems.

## STRUCTURAL



*Collapse of transmission towers during 1998 ice storm*

Structural Engineers analyse, design and construct the structure of buildings and other infrastructure to resist gravity, wind, earthquake and other forces. In addition to steel, concrete and wood, new construction materials such as fibre-reinforced composites are being developed. The rehabilitation and maintenance of structures is also vital to the long-term performance of infrastructure.

*Below right: Nuclear Waste Repository in Salt Mine*

*Below left: Daniel Johnson Dam, Quebec*

## GEOTECHNICAL

Geotechnical Engineers study soil behaviour under the influence of forces for the design of foundations, retaining walls and earth dams, and for the selection of railroad and highway routes. Geoenvironmental engineers develop strategies for the clean-up and management of contaminated aquifers and sites.



## WATER RESOURCES



Water Resources and Hydraulics Engineers design and operate systems to control and utilize water. Applications include the design of urban storm-sewer systems, dams and breakwaters, the management of water supplies and waterways, as well as erosion and flood protection.

# Civil Engineering

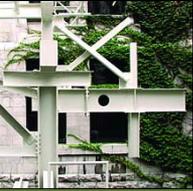
## areas of specialization

## TRANSPORTATION

*TGV, high-speed rail system, France*



Transportation Engineers provide for the safe, efficient and convenient movement of people, goods and services by planning, constructing, operating and maintaining road, rail, air and public transit systems. The transportation infrastructure should ensure mobility and accessibility for all segments of society while promoting socially desirable land-use.



Your future

# beyond university

Career opportunities are very diverse. After graduation civil engineers are often employed as technical specialists, and with increasing experience become managers and policy makers. Employment opportunities range from working on contract projects for individual companies such as consulting firms or construction companies, to working for municipalities that commission projects or for government agencies that oversee industries and communities. Many engineers also find careers working with financial institutions that fund projects or, in the spirit of entrepreneurship, establish their own companies.

Assistance in your job search is provided by The McGill Engineering Career Centre:

<http://www.mcgill.ca/mecc>

## Global Opportunities

IN 2050 THE GLOBAL POPULATION WILL HAVE INCREASED BY 3.2 BILLION TO 9.3 BILLION, WHICH WILL PRESENT NEW CHALLENGES TO OUR CITIES. CIVIL ENGINEERS WILL MEET THE CHALLENGES BY DEVELOPING:

- INTELLIGENT TRANSPORTATION SYSTEMS THAT HELP MANAGE TRAFFIC FLOWS.
- SMART MATERIALS THAT WARN OF IMPENDING STRUCTURAL FAILURE.
- ACTIVE EARTHQUAKE DAMPING SYSTEMS THAT PROTECT HIGH-RISE BUILDINGS.
- TECHNOLOGIES FOR A CLEAN ENVIRONMENT.

**Designing  
tomorrow's  
sustainable  
infrastructure**

# Beyond OUR doors

*“McGill was excellent in preparing me for my career, it provided me with a well-rounded education. At work, I have used something from every environmental engineering course I took at McGill.”*

BEng'02 (Civil), MEng '04 (Civil)  
Analyst, Accenture, Montreal, Canada.

Major Projects:  
Analyst for information technology and management projects for clients such as Bell Canada, Direct Energy, Enbridge and Alcatel.

**THAMMER EL-RAMAH**

## SYLVIA LEE

BEng'98, (Civil), MEng'99, (Civil, MIT)  
Associate Engineer, Montgomery Watson,  
Boston, USA

Project Engineer, MWH, Boston, USA

Major Projects:

Project Engineer for City of Cambridge  
Stormwater Management Modeling and  
Design Projects

Project Engineer for the design and construction of Massachusetts Water Resources Authority (MWRA) Spot Pond Water Supply Mains Rehabilitation Project

*“The analytical skills I have gained through my university experience have helped me in diverse tasks such as analyzing complex data and developing business process plans. The education and problem solving skills I received at McGill will undoubtedly help me excel in my career.”*

## CINDY HUNZINGER

BEng'00 (Civil), MEng'02 (Civil)  
Structural Engineer, SNC-Lavalin Inc.

Major Projects:  
Structural design of the L'Acadie Elevated Roundabout  
Evaluation of a new prefabricated deck for the Mercier Bridge

*“The civil engineering program at McGill provided me with the necessary technical skills to compete in the increasingly competitive field of structural engineering. The professors and the students created an environment that was both challenging and warm, which inspired me while at McGill and into my professional career.”*

*“McGill's Civil Engineering degree provided me with the technical background necessary to embark on my structural engineering career. The McGill ambiance and overall university experience allowed me to develop the personal skills needed to succeed in today's competitive market place.”*

BEng'68 (Civil)  
Vice President Engineering, Research and Development  
The Canam Group Inc.

Major projects:  
Corel Centre, Ottawa  
Boston Convention & Exhibition Center, Massachusetts

**RICHARD B. VINCENT**

B Eng'93 (Civil); MEng'95 (Civil)  
Physical Scientist, Meteorological Service of Canada  
Environment Canada

Major Projects:  
Science and policy advisor on the atmospheric fate of toxic pollutants  
Managing the Canada-U.S. Integrated Atmospheric Deposition Network

**ELISABETH GALARNEAU**

*“McGill's Civil Engineering undergraduate and graduate programs gave me a solid grounding in the technical disciplines. However, the most positive and long-lasting influence on my career and personal life has come from the general aspects of that education. It has taught me how to define problems rigorously, and how to research and learn in order to solve those problems. I will always be grateful for the enrichment I received from McGill's Civil Engineering programs and professors.”*



## Growing with Canada

Civil engineering at McGill (est. 1871) continues to be a centre of excellence in teaching and research. The Department currently has 15 full-time faculty members. In addition, an industrial perspective is provided in the classroom by instruction from practicing civil engineers. There are approximately 350 undergraduate and 80 graduate students in the department, of whom nearly one-third are women and one-fifth are from outside Canada. A broad program of study is available that offers specialized courses in all areas of civil engineering. Our facilities include state-of-the-art teaching, research and computing laboratories.

*The Macdonald  
Engineering  
Building, home of  
Civil Engineering*





### Barbados Field Study Semester

*A full semester of interdisciplinary studies on sustainable water development is offered at McGill's Bellairs Research Institute in Barbados. The program offers hands-on field experience in the technological and socio-economic aspects of water supply and resource management. The program challenges students to be more effective environmental decision makers.*

[www.mcgill.ca/civil/](http://www.mcgill.ca/civil/)



## Visit Us!

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