Faculty of Engineering, including Schools of Architecture and Urban Planning (Graduate)

Programs, Courses and University Regulations

2016-2017

This publication provides guidance to prospects, applicants, students, faculty and staff.

1 . McGill University reserves the right to mak

Publication Information

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1 Dean's Welcome

To Graduate Students and Postdoctoral Fellows:

I am extremely pleased to welcome you to McGill University

As a rule, no more than one-third of the formal coursework (excluding thesis, project, stage, or internship) of a McGill master's degree can be credited with courses from another university or degree (for example, courses taken before admission to the McGill degree, or courses taken through the IUT agreement during the McGill degree, if permitted).

Normally, if courses completed elsewhere or at McGill prior to admission to the McGill master’s degree were not used to complete a degree, they could be credited toward the McGill degree, keeping in mind the one-third rule as described above. These would be entered as exemptions with credit at the time of admission.

If the courses completed elsewhere or at McGill prior to admission were used to complete a degree, exemptions may be granted without credit, i.e. the exempted course(s) must be replaced by other graduate course(s) at McGill. No double counting is allowed unless, exceptionally, the department offering the Master’s degree permits it and the degree has an overall credit requirement greater than 45 credits. In other words, instances where exemptions with credit may be granted will be limited to the credit amount beyond the minimum of 45 credits for a McGill master’s degree. The one-third rule as described above continues to apply.

Research and Thesis – Master's Degrees

All candidates for a research degree must present a thesis based on their own research. The total number of credits allotted to the thesis in any master's program must not be less than 24. The title of the thesis and names of examiners must be forwarded on a *Nomination of Examiners and Thesis Submission* form, available at *www.mcgill.ca/gps/thesis/guidelines/initial-submission*, in accordance with the dates on *www.mcgill.ca/importantdates*, through the Chair

7 Fellowships, Awards, and Assistantships

Please refer to *University Regulations and Resources* > *Graduate* > *: Fellowships, Awards, and Assistantships* for information and contact information regarding fellowships, awards, and assistantships in Graduate and Postdoctoral Studies.

8 Postdoctoral Research

Students must inform themselves of University rules and regulations and keep abreast of any changes that may occur. The *Postdoctoral Research* section of this publication contains important details required by postdoctoral scholars during their studies at McGill and should be periodically consulted, along with other sections and related publications.

8.1 Postdocs

Postdocs are recent graduates with a Ph.D. or equivalent (i.e., Medical Specialist Diploma) engaged by a member of the University's academic staff, including Adjunct Professors, to assist him/her in research.

Postdocs must be appointed by their department and registered with Enrolment Services in order to have access to University facilities (library, computer, etc.).

8.2 Guidelines and Policy for Academic Units on Postdoctoral Education

The general guidelines listed below are meant to encourage units to examine their policies and procedures to support postdoctoral education. Every unit hosting Postdocs should have explicitly stated policies and procedures for the provision of postdoctoral education as well as established means for informing Postdocs of policies, procedures, and privileges (e.g., orientation sessions, handbooks, etc.), as well as mechanisms for addressing complaints. Academic units should ensure that their policies, procedures and privileges are consistent with these guidelines and the Charter of Students' Rights. For their part, Postdocs are responsible for informing themselves of policies, procedures, and privileges.

1. **Definition and Status**

   i. Postdoctoral status will be recognized by the University in accordance with Quebec provincial regulations. Persons may only be registered with postdoctoral status for a period of up to five years from the date they were awarded a Ph.D. or equivalent degree. Time allocated to parental or health leave is added to this period of time. Leaves for other reasons, including vacation leave, do not extend the term. Postdocs must do research under the supervision of a McGill professor, including Adjunct Professors, who is a member of McGill's academic staff qualified in the discipline in which training is being provided and with the abilities to fulfil responsibilities as a supervisor of the research and as a mentor for career development. They are expected to be engaged primarily in research with minimal teaching or other responsibilities.

2. **Registration**

   i. Postdocs must be registered annually with the University through Enrolment Services. Initial registration will require an original or notarized copy of the Ph.D. diploma. Registration will be limited to persons who fulfil the definition above and for whom there is an assurance of appropriate funding and where the unit can provide assurance of the necessary resources to permit postdoctoral education.

   ii. Upon registration, the Postdoc will be eligible for a University identity card issued by Enrolment Services.

3. **Appointment, Pay, Agreement of Conditions**

   i. Appointments may not exceed your registration eligibility status.

   ii. In order to be registered as a Postdoc, you must be assured of financial support other than from personal means during your stay at McGill University, equivalent to the minimal stipend requirement set by the University in accordance with guidelines issued by federal and provincial research granting agencies. There are no provisions for paid parental leave unless this is stipulated in the regulations of a funding agency outside the University.

   iii. At the outset of a postdoctoral appointment, a written Letter of Agreement for Postdoctoral Education should be drawn up and signed by the Postdoc, the supervisor, and the department head or delegate (see template Letter of Agreement and supporting document—*Commitments of Postdoctoral Scholars and Supervisors*—available at *www.mcgill.ca/gps/postdocs/fellows/responsibilities*). This should stipulate, for example, the purpose of the postdoctoral appointment (research training and the advancement of knowledge), the duration of the fellowship/financial support, the modality of pay, the work space, travel funds, and expectations and compensation for teaching and student research supervision. Leave8 164.7s1 1 5385 130.75 Tm(Commitel fRadvsc7dequi)Tj, the

iv. Postdocs with full responsibility for teaching a course should be compensated over and above their fellowship at the standard rate paid to lecturers by their department. This applies to all postdocs, e

vii. Some examples of the responsibilities of the University are:

- to register Postdocs;
- to provide an appeal mechanism in cases of conflict;
- to provide documented policies and procedures to Postdocs;
- to provide Postdocs with the necessary information on McGill University student services.

Approved by Senate, April 2000; revised May 2014

Vacation Policy for Graduate S

General Conditions

- The maximum duration is three years;
- the individual must be engaged in full-time research;
- the individual must provide copies of official transcripts/diploma;
- the individual must have the approval of a McGill professor to supervise the research and of the Unit;
- the individual must have adequate proficiency in English, but is not required to provide official proof of English competency to Enrolment Services;
- the individual must comply with regulations and procedures governing research ethics and safety and obtain the necessary training;
- the individual will be provided access to McGill libraries, email, and required training in research ethics and safety. Any other University services must be purchased (e.g., access to athletic facilities);
- the individual must arrange for basic health insurance coverage prior to arrival at McGill and may be required to provide proof of coverage.

9 Graduate Studies Guidelines and Policies

Refer to *University Regulations and Resources* > *Graduate* > *: Guidelines and Policies* for information on the following:

- Guidelines and Regulations for Academic Units on Graduate Student Advising and Supervision
- Policy on Graduate Student Research Progress Tracking
- Ph.D. Comprehensives Policy
- Graduate Studies Reread Policy
- Failure Policy
- Guideline on Hours of Work

10 Information on Research Policies and Guidelines, Patents, Postdocs, Associates, Trainees

Refer to *University Regulations and Resources* > *Graduate* > *: Research Policy and Guidelines, Patents, Postdocs, Associates, Trainees* for information on the following:

- Policy on Research Ethics
- Regulations on Research Policy
- Policy on Research Integrity
- Guidelines for Research Involving Human Subjects
- Guidelines for Research with Animal Subjects
- Policy on Intellectual Property
- Regulations Governing Conflicts of Interest
- Safety in Field Work
- Office of Sponsored Research
- Postdocs
- Research Associates

11 Browse Academic Units & Programs

The programs and courses in the following s172 0 1 230.788 146l,p

dissertation. If approved, the dissertation will then be submitted in its final form to the Thesis Office. Acceptance of the thesis by the examiners is followed by an oral defence.

11.1.3 Architecture Admission Requirements and Application Procedures

11.1.3.1 Admission Requirements

M.Arch. (Professional) Program (Non-Thesis)

Applicants holding the McGill B.Sc.(Arch.) degree, or equivalent, with a cumulative grade point average (CGPA) of at least 3.0 on a scale of 4.0, are eligible to apply for admission.

M.Arch. (Post-professional) (Non-Thesis)

Applicants holding an accredited professional degree in architecture, or equivalent, with a cumulative grade point average (CGPA) of at least 3.0 on a scale of 4.0, are eligible to apply for admission. In special cases, candidates with a degree in a related field may be considered.

Ph.D.

Candidates with high standing in McGill's M.Arch. (Post-professional), or who hold an equivalent degree from another university, are eligible to apply to this program. Those who do not have an appropriate background in the chosen research area may be recommended for the M.Arch. (Post-professional) program. Candidates who have an adequate background at the post-professional master's level in the proposed area of research will be admitted to Ph.D. 2

Emeritus Professors

Bruce Anderson; B.Arch.(McG.), M.Arch.(Harv.), F.R.A.I.C., O.A.Q.

Derek Drummond; B.Arch.(McG.), F.R.A.I.C., O.A.Q., O.A.A. (*William C. Macdonald Emeritus Professor of Architecture*)

Adrian Sheppard; B.Arch.(McG.), M.Arch.(Yale), A.A.P.P.Q., F.R.A.I.C., O.A.Q.

Radoslav Zuk; B.Arch.(McG.), M.Arch.(MIT), D.Sc.(U.A.A.), F.R.A.I.C., O.A.Q., O.A.A.

Professors

Annmarie Adams; B.A.(McG.), M.Arch., Ph.D.(Calif., Berk.), M.R.A.I.C. (*William C. Macdonald Professor of Architecture*)

Vikram Bhatt; N.Dip. Arch.(Ahmed.), M.Arch.(McG.), M.R.A.I.C.

Martin Bressani; B.Sc.(Arch.), B.Arch.(McG.), M.Sc.(Arch.)(MIT), D.E.A., Docteur(Paris IV), O.A.Q.

Avi Friedman; B.Arch.(Technion), M.Arch.(McG.), Ph.D.(Montr.), O.A.Q., I.A.A.

Alberto Pérez-Gómez; Dipl.Eng.Arch.(Nat. Pol. Inst. Mexico), M.A., Ph.D.(Essex), M.R.A.I.C. (*Saidye Rosner Bronfman Professor of Architectural History*)

Associate Professors

Ricardo L. Castro; B.Arch.(Los Andes, Col.), M.Arch., M.A.(Ore.), F.R.A.I.C.

David Covo; B.Sc.(Arch.), B.Arch.(McG.), F.R.A.I.C., O.A.Q.

Michael Jemtrud; B.A., B.Sc., B.Arch.(Penn. St.), M.Arch.(McG.), M.R.A.I.C.

Nik Luka; B.A.A.(Ryerson), M.Arch.(Laval), Ph.D.(Tor.), M.C.I.P.

Robert Mellin; B.Arch., M.Sc.(Arch.)(Penn.), M.Arch.(McG.), M.Sc., Ph.D.(Penn.), F.R.A.I.C., N.A.A.

Aaron Sprecher; B.Arch.(Bezalel), M.Arch.(Calif.-LA).

Assistant Professors

David Theodore; B.A., B.Sc.(Arch.), B.Arch., M.Arch.(McG.), Ph.D.(Harv.)

Ipek Türeli; B.Arch.(Istanbul), A.A.Dipl.(A.A.), Ph.D.(Calif., Berk.)

Adjunct Professors

Howard Davies, Julia Gersovitz, Andrew King, Conor Sampson

Course Lecturers

Vedanta Balbahadur, Erika Brandl-Mouton, Clothilde Caillé-Levesque, Yves de Fontenay, Nancy Dunton, Fabrizio Gallanti, Eric Gauthier, Marc Hallé, Edward Houle, Laurent Laframboise, Hubert Pelletier, Marc-André Plourde, Pierina Saia, Pieter Sijpkes, Angela Silver

Visiting Critics and Guest Lecturers

Each year, visitors are involved in the teaching of certain courses as critics and lecturers. These visitors change from year to year. The following were visitors in 2015:

Tiphaine Abenia, Gavin Affleck, Chandler Ahrens, Ronnie Araya, Manon Asselin, George Baird, Tom Balaban, Giovanna Borasi, Kevin Botchar, Georges Boulette, Sinisha Brdar, Brian Brush, Andrew Butler, Trevor Butler, Stephane Chevalier, Azad Chichmanian, Jean-Pierre Chupin, Christina Contandriopoulos, Andrew Curtis, Jamie Dabner, Matt Daubach, Trevor Davies, Talia Dorsey, Jean-Maxime Dufresne, Mary Jean Eastman, David Edgars, Tom Egli, Viviane Ehrensberger, Andrew Forster, Maxime-Alexis Frappier, Simon Glew, Erica Goldstein, Paul Guenther, Susane Havelka, Mimi Hoang, Timothy Hyde, Hans Ibelings, Chris Ilg, Hal Ingberg, Jayne Kelley, Stephan Kowal, Michel Langevin, Emmanuelle Lapointe, Michel Lauzon, Jonathan Lessard, Carole Levesque, Jing Liu, Leslie Lok, Jeff Ma, Andrea MacElwee, Vouli Mamfredis, Cecile Martin, Eric Marosi, John McMinn, Mélanie Mignault, Shawn Moscovitch, Shaheen Namvary, Son Nguyen, Mark Poddubiuk, Stephane Pratte, Sheldon Reich, Joan Renaud, Sophie Robitaille, Lia Ruccolo, Barry Sampson, Roxanne Sayegh, Samantha Christine Scheider, Peter Sealy, Lola Sheppard, John Shnier, Malkit Shoshan, Inderbir Riar Singh, Angeliki Sioli, Lars Spuybroek, Cliff Stendel, Rebecca Taylor, Alanna Thain, David Wees, Dan Wood, Sasa Zivkovic

11.1.5 Master of Architecture (M.Arch.); Professional (Non-Thesis) — Design Studio (45 credits)

This concentration is a 45-credit, three-term (Fall, Winter, and Fall) program based on a design-intensive professional curriculum and centred on the design studio. Students work in a traditional studio format for the first two terms and with individual advisers in the terminal design project course in the third (Fall) term. Complementary and elective courses are organized to provide flexibility in individual program i

Required Courses (32 credits)

ARCH 550	(3)	Urban Planning and Development
ARCH 672	(6)	Architectural Design 1
ARCH 673	(6)	Architectural Design 2

Elective Courses

0-3 credits

Up to 3 credits (at the 500 or 600 level) may be taken outside the School of Architecture, with the approval of an assigned faculty adviser.

11.1.6 Master of Architecture (M.Arch.); Professional (Non-Thesis) — Design Studio-Directed Research (60 credits)

The Directed Research concentration is a 60-credit four-term (Fall, Winter, Summer, Fall) program that complements the regular 45-credit three-term concentration with a supervised 12-credit individual research report in the summer term. This forms the basis of the terminal design studio in the fourth (Fall) term. Each student is assigned a faculty adviser in the second term and follows a research-intensive curriculum shaped by complementary and elective courses chosen in consultation with, and approved by, the adviser.

Required Courses (48 credits)

ARCH 550	(3)	Urban Planning and Development
ARCH 626	(4)	Critical Design Strategies
ARCH 672	(6)	Architectural Design 1
ARCH 673	(6)	Architectural Design 2
ARCH 674	(3)	Professional Practice 1
ARCH 676	(12)	Directed Research Report
ARCH 678	(3)	Advanced Construction
ARCH 680	(2)	Field Sketching
ARCH 683	(9)	Directed Research Project 2

Complementary Courses

(9-12 credits)

Group A:

3-12 credits chosen from the following courses:

ARCH 523	(3)	Significant Texts and Buildings
ARCH 525	(3)	Seminar on Analysis and Theory
ARCH 531	(3)	Architectural Intentions Vitruvius - Renaissance
ARCH 532	(3)	Origins of Modern Architecture
ARCH 562	(3)	Innovative Homes and Communities
ARCH 602	(4)	Housing Seminar
ARCH 604	(4)	Urban Design Seminar
ARCH 684	(4)	Contemporary Theory 1
ARCH 685	(4)	Contemporary Theory 2

Group B:

0-9 credits chosen from the following courses:

ARCH 512	(3)	Architectural Modelling
ARCH 514	(4)	Community Design Workshop
ARCH 515	(3)	Sustainable Design
ARCH 517	(3)	Sustainable Residential Development
ARCH 520	(3)	Montreal: Urban Morphology
ARCH 521	(3)	Structure of Cities
ARCH 525	(3)	Seminar on Analysis and Theory

ARCH 526	(3)	Philosophy of Structure
ARCH 527	(3)	Civic Design
ARCH 528	(3)	History of Housing
ARCH 529	(3)	Housing Theory
ARCH 531	(3)	Architectural Intentions Vitruvius - Renaissance
ARCH 532	(3)	Origins of Modern Architecture
ARCH 533	(3)	New Approaches to Architectural History
ARCH 535	(3)	History of Architecture in Canada
ARCH 536	(3)	Heritage Conservation
		Selected Topics in

ARCH 627	(4)	Research Methods for Architects

Group A Complementary Courses (9 credits)

6-9 credits from the following:

ARCH 514	(4)	Community Design Workshop
ARCH 517	(3)	Sustainable Residential Development
ARCH 520	(3)	Montreal: Urban Morphology
ARCH 521	(3)	Structure of Cities
ARCH 529	(3)	Housing Theory
		Innovative Homes and Cesearcties

- Biomolecular and cellular engineering
- Biomedical, diagnostics, and high throughput screening

11.2.3 Graduate Studies

Graduate study in Bioengineering is available through the Biological and Biomedical Engineering (BBME) graduate program, offered jointly by the Department of Bioengineering (Faculty of Engineering) and the Department of Biomedical Engineering (Faculty of Medicine). Biological and Biomedical Engineering is a broad, interdisciplinary field that involves the application of engineering, the physical sciences, biological sciences, and computer science to medicine and the life sciences. McGill's BBME program offers unsurpassed opportunities for multidisciplinary research with internationally-renowned scientists.

Please refer to *section 11.3: Biological and Biomedical Engineering* for further information on these programs.

11.2.4 Bioengineering Faculty

Chair

Dan V. Nicolau

Professors

Dan V. Nicolau; B.Eng., M.Eng.(Poly. Univ. Bucharest), M.S.(Acad. Economic Studies, Bucharest), Ph.D.(Poly. Univ. Bucharest)

Amine Kamen; Ph.D.(Mines ParisTech), Ph.D.(École Poly., Montr.)

Associate Professor

Yu (Brandon) Xia; B.Sc.(Peking), Ph.D.(Stan.)

Assistant Professors

Allen Ehrlicher; B.Sc., B.A.(Texas-Austin), M.Sc., Ph.D.(Leipzig)

Adam Hendricks; B.S., M.S.(Virg. Poly. Inst. & State Univ.), Ph.D.(Mich.)

J. Matt Kinsella; B.Sc.(SXU, Chicago), M.S., Ph.D.(Purd.)

Georgios Mitsis; Dipl.(Nat. Tech., Athens), M.S.(Elect. Eng.), M.S.(Biomed. Eng.), Ph.D.(USC)

11.3 Biological and Biomedical Engineering

11.3.1 Location

Duff Medical Building
3775 University Street, Room 316
Montreal QC H3A 2B4
Canada
Website: *www.mcgill.ca/bbme*

11.3.2 About Biological and Biomedical Engineering

The Biological and Biomedical Engineering (BBME) graduate program is a new interfaculty program involving the Department of Bioengineering in the Faculty of Engineering and the Department of Biomedical Engineering in the Faculty of Medicine. The new BBME interfaculty program builds on the excellence and high standard of its predecessor graduate program in Biomedical Engineering. This broader interfaculty restructuration supports the grow section n9nT B

11.3.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at *www.mcgill.ca/gradapplicants/apply*.

See *University Regulations and Resources* > *Graduate* > *Graduate Admissions and Application Procedures* > *: Application Procedures* for detailed application procedures.

Please address enquiries directly to *info.bbme@mcgill.ca*.

11.3.3.3 Application Deadlines

The application deadlines listed here are set by the Biological and Biomedical Engineering Graduate Program and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at *www.mcgill.ca/gps/contact/graduate-program*. For additional information, please consult *www.mcgill.ca/bbme/prospective-students/how-apply*.

Canadian	International	Special/Exchange/Visiting
Fall: Feb. 1	Fall: Feb. 1	Fall: Same as Canadian/International
Winter: Nov. 10	Winter: Sept. 10	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

Note: Applications for Summer term admission will not be considered.

11.3.4 Biological and Biomedical Engineering Faculty

Biological and Biomedical Engineering is an interfaculty program offered jointly by the *Department of Bioengineering* in the Faculty of Engineering and the *Department of Biomedical Engineering* in the Faculty of Medicine.

Please refer to *section 11.2.4: Bioengineering Faculty* and *: Biomedical Engineering Faculty* for their respective faculty listings.

11.3.5 Master of Engineering (M.Eng.); Biological and Biomedical Engineering (Thesis) (45 credits)

** NEW PROGRAM **

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.Eng.) 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.

Thesis Courses (24 credits)

BBME 693	(6)	Thesis Research 1
BBME 694	(6)	Thesis Research 2
BBME 695	(12)	Thesis Submission

Required Courses (3 credits)

BBME 600D1	(1.5)	Seminars in Biological and Biomedical Engineering
BBME 600D2	(1.5)	Seminars in Biological and Biomedical Engineering

Complementary Courses (18 credits)

12 credits from BMDE or BIEN courses at the 500-level or higher which may also include MDPH 607, of which the following must be included:

3 credits from BMDE and 3 credits from BIEN

3 credits from the following quantitative courses, or other quantitative courses (at the 500-level or higher) approved by the Graduate Program Director.

MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MECH 500*	(3)	Selected Topics in Mechanical Engineering
MECH 561	(3)	Biomechanics of Musculoskeletal Systems
PHGY 517	(3)	Artificial Internal Organs
PHGY 518	(3)	Artificial Cells

* When topic is appropriate.

11.3.6 Doctor of Philosophy (Ph.D.); Biological and Biomedical Engineering

** NEW PROGRAM **

The goal of the Biological and Biomedical Engineering Ph.D. program is for students to gain advanced training in the interdisciplinary application of methods, paradigms, technologies, and devices from engineering and the natural sciences to problems in biology, medicine, and the life sciences. The program will focus in an area of choice while integrating quantitative concepts and engineering tools for the study of life sciences and/or for patient care. As part of the Ph.D. requirement, the student will integrate the scientific method, develop critical and deep thinking, and acquire advanced writing and presentation skills that will form the foundation for his/her career. Under the guidance of his/her supervisor, the student will tackle a research challenge and make original contributions to the advancement of science and engineering in an area of Biological and Biomedical Engineering. The program will prepare students for careers in academia, industry, hospitals and government. Students who complete the program will obtain a Doctor of Philosophy in Biological and Biomedical Engineering. The best preparation for this program is a Master's degree in BBME or a related discipline.

Thesis

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Course

BBME 700	()

Students must be registered in this course at the time of the Thesis Proposal and Comprehensive Exam Meeting.

Further courses may be required by the supervisor(s) in consultation with the Graduate Program Director, depending on the educational background of individual students.

11.4 Chemical Engineering

11.4.1 Location

Department of Chemical Engineering
M.H. Wong Building
3610 University Street
Montreal QC H3A 0C5
Canada
Telephone: 514-398-4494
Fax: 514-398-6678
Email: *gradinfo.chemeng@mccgill.ca*
Website: *www.mcgill.ca/chemeng*

11.4.2 About Chemical Engineering

The Department offers programs leading to the **Master of Engineering** and the **Doctor of Philosophy**

The Department's offices and research laboratories are located in the M.H. Wong Building. Collectively

section 11.4.5: Master of Engineering (M.Eng.); Chemical Engineering (Thesis) (45 credits)

The M.Eng. in Chemical Engineering (Thesis) is a research-oriented degree that allows the candidates to refine their skills by expanding their knowledge of chemical engineering through coursework and a research thesis under the supervision of a Faculty member (professor). The M.Eng. (Thesis) program offers advanced training in not only fundamentals but also research methods and is, therefore, the more suitable option for those whose primary interest is research. Graduates of this degree either pursue a Ph.D. or work in industry.

section 11.4.6: Master of Engineering (M.Eng.); Chemical Engineering (Non-Thesis) (45 credits)

The M.Eng. in Chemical Engineering (Non-Thesis) is a course-oriented degree, which includes a short project completed under the supervision of a Faculty member (professor). Through the program, graduate students can advance their knowledge in various chemical engineering disciplines through coursework and technical training.

section 11.4.7: Master of Engineering (M.Eng.); Chemical Engineering (Non-Thesis) — Environmental Engineering (45 credits)

This program is currently not offered.

The M.Eng. in Chemical Engineering (Non-Thesis) – Environmental Engineering is a specialized version of the M.Eng. in Chemical Engineering (Non-Thesis). This inter-departmental graduate program leads to a master’s degree in Environmental Engineering. The objective of the program is to train environmental professionals at an advanced level. The program is designed for individuals with an undergraduate degree in e

11.4.3.3 Application Deadlines

The application deadlines listed here are set by graduate departments, and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in adv

11.4.5 Master of Engineering (M.Eng.); Chemical Engineering (Thesis) (45 credits)

Thesis Courses (31 credits)

CHEE 697	(6)	Thesis Proposal
CHEE 698	(12)	Thesis Research 1
CHEE 699	(13)	Thesis Research 2

Required Courses (4 credits)

CHEE 681	(1)	Laboratory Safety 1
CHEE 682	(1)	Laboratory Safety 2
CHEE 687	(2)	Research Skills and Ethics

Complementary Courses (10 credits)

4 credits from the following:

CHEE 611	(4)	Heat and Mass Transfer
CHEE 621	(4)	Thermodynamics
CHEE 631	(4)	Foundations of Fluid Mechanics
CHEE 641	(4)	Chemical Reaction Engineering
CHEE 651	(4)	Advanced Biochemical Engineering
CHEE 662	(4)	Computational Methods
CHEE 672	(4)	Process Dynamics and Control

A minimum of 3 credits of Chemical Engineering courses at the 500, 600, or 700 level.

Any remaining complementary course credit requirements may be fulfilled by completing Chemical Engineering or other Engineering or Science courses at the 500, 600, or 700 level.

11.4.6 Master of Engineering (M.Eng.); Chemical Engineering (Non-Thesis) (45 credits)

Research Project

Project (design or research): 6-12 credits.

6 credits must include the following course:

CHEE 695	(6)	Project in Chemical Engineering

Complementary Courses

33-39 credits (a minimum of 18 credits in Chemical Engineering) at the 500, 600, or 700 level.

9 credits must be in an area of concentration.

12 additional courses at the 500, 600, or 700 lev

CHEE 695	(6)	Project in Chemical Engineering

Required Courses (6 credits)

CHEE 591	(3)	Environmental Bioremediation
CIVE 615	(3)	Environmental Engineering Seminar

Complementary Courses (22 credits)

Minimum of 22 credits

Data analysis course: (3 credits)

AEMA 611	(3)	Experimental Designs 1
CIVE 555	(3)	Environmental Data Analysis
PSYC 650	(3)	Advanced Statistics 1

Toxicology: (3 credits)

Principles of Toxicologym(T)Tj1 0 0 1 269..43 TmTj1 0(3)

or another Engineering or non-Engineering 500-, 600-, or 700-level course subject to approval.

11.4.8 Doctor of Philosophy (Ph.D.); Chemical Engineering

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses

CHEE 681	(1)	Laboratory Safety 1
CHEE 682	(1)	Laboratory Safety 2
CHEE 687	(2)	Research Skills and Ethics
CHEE 795	(0)	Ph.D. Thesis Proposal
CHEE 796	(0)	Ph.D. Proposal Defence
CHEE 797	(0)	Ph.D. Seminar

Complementary Courses

(6-12 credits)

6-8 credits of Chemical Engineering courses (two courses) at the 500, 600, or 700 level.

12 credits (three courses) from the following list must be taken during the M.Eng. and/or Ph.D. program:

CHEE 611	(4)	Heat and Mass Transfer
CHEE 621	(4)	Thermodynamics
CHEE 631	(4)	Foundations of Fluid Mechanics
CHEE 641	(4)	Chemical Reaction Engineering
CHEE 651	(4)	Advanced Biochemical Engineering
CHEE 662	(4)	Computational Methods
CHEE 672	(4)	Process Dynamics and Control

* Note: The number of credits taken will depend on how many of these courses have been taken during the M.Eng. program. Three courses from the above list must be taken during the M.Eng.and/or Ph.D. program. If not taken during the M.Eng. program, they must be taken during the Ph.D. program.

11.5 Civil Engineering and Applied Mechanics

11.5.1 Location

Department of Civil Engineering and Applied Mechanics
Macdonald Engineering Building, Room 492
817 Sherbrooke Street West
Montreal QC H3A 0C3
Canada
Telephone: 514-398-6858
Fax: 514-398-7361
Email: *gradinfo.civil@mcgill.ca*
Website: *www.mcgill.ca/civil*

11.5.2 About Civil Engineering and Applied Mechanics

Advanced courses of instruction and laboratory facilities are available for Engineering graduate students who wish to proceed to the degrees of **M.Eng.**, **M.Sc.**, and **Ph.D.**

Graduate studies and research are at present being conducted in the fields of structures and structural mechanics; infrastructure rehabilitation; risk engineering; fluid mechanics and hydraulics; materials engineering; soil behaviour; soil mechanics and foundations; water resources engineering; environmental engineering; and transportation engineering.

M.Eng. in Civil Engineering

The master's degree can be pursued as a research degree (thesis) or as a coursework-based degree (project). The thesis degree is for those who wish to undertake research while the project degree is for those who wish to have a broader and more specialized training in civil engineering.

section 11.5.5: Master of Engineering (M.Eng.); Civil Engineering (Thesis) (45 credits)

Students obtain a deeper understanding of their area of specialty through courses selected with their supervisor. A two- to three-semester independent research project is undertaken in the field of structures and structural materials; infrastructure rehabilitation; risk engineering; fluid mechanics and hydraulics; materials engineering; soil behaviour; soil mechanics and foundations; water resources engineering; environmental engineering; and transportation engineering.

section 11.5.6: Master of Science (M.Sc.); Civil Engineering (Thesis) (45 credits)

Candidates with a bachelor's degree in a discipline other than Engineering, such as Science or Arts, may be accepted into an M.Sc. program in the Department. Such students would typically study in the fluid mechanics, water resources, environmental engineering, or transportation engineering areas, and would follow the thesis option program.

section 11.5.7: Master of Engineering (M.Eng.); Civil Engineering (Non-Thesis) (45 credits)

This is primarily a coursework degree with a small independent project.

section 11.5.8: Master of Engineering (M.Eng.); Civil Engineering (Non-Thesis) — Environmental Engineering (45 credits)

This program is offered to students with a university undergraduate degree in engineering who desire graduate education in the environmental engineering field. This non-thesis option is within the context of the existing M.Eng. (project option) programs currently offered in the Departments of Bioresource Engineering (Agricultural and Environmental Sciences); Chemical Engineering; Civil Engineering; and Mining, Metals, and Materials Engineering. This program emphasizes interdisciplinary fundamental knowledge courses, practical applications in diverse environmental contexts, and functional skills needed for solving environmental problems through a wide range of technical and non-technical courses offered by collaborating departments and faculties at the University. Candidates must possess a bachelor's degree in engineering. The Environmental Engineering option is administered by the Faculty of Engineering.

Further information may be obtained from the Program Coordinator, Department of Civil Engineering and Applied Mechanics.

section 11.5.9: Doctor of Philosophy (Ph.D.); Civil Engineering

Research can be conducted in the fields of structures and structural mechanics; infrastructure rehabilitation; risk engineering; fluid mechanics and hydraulics; materials engineering; soil behaviour; soil mechanics and foundations; water resources engineering; environmental engineering; and transportation engineering.

11.5.3 Civil Engineering and Applied Mechanics Admission Requirements and Application Procedures

11.5.3.1 Admission Requirements

Test results reach McGill approximately eight weeks after the test is taken; please note that it is the student's responsibility to make the necessary arrangements with the examining board to write the test in his/her country of residence. Full information and registration forms may be obtained by consulting the *TOEFL* or the *IELTS* websites.

You must meet **both** of these requirements to be eligible to apply. Meeting minimum requirements does not guarantee admission.

11.5.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at *www.mcgill.ca/gradapplicants/apply*.

See *University Regulations and Resources* > *Graduate* > *Graduate Admissions and Application Procedures* > *: Application Procedures* for detailed application procedures.

11.5.3.3 Application Deadlines

The application deadlines listed here are set by the Department of Civil Engineering and Applied Mechanics and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill academic unit's website; please consult the list at *www.mcgill.ca/gps/contact/graduate-program*.

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Jan. 15
Winter: Oct. 15	Winter: Sept. 10	Winter: Sept. 10
Summer: N/A	Summer: N/A	Summer: N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

Note: Applications for Summer term admission will not be considered.inter: Oct. mcgill.ca/gr

Associate Professors

Susan J. Gaskin; B.Sc.(Eng.)(Qu.), Ph.D.(Cant.), Eng.

Ronald Gehr; B.Sc.(Eng.)(Witw.), M.A.Sc., Ph.D.(Tor.), P.Eng., F.C.S.C.E.

Subhasis Ghoshal; B.C.E.(Jadavpur), M.S.(Missouri), Ph.D.(Carn. Mell), P.Eng.

Mohamed A. Meguid; B.Sc.(Cairo), M.Sc., Ph.D.(W. Ont.), P.Eng; Associate Dean, Undergraduate Education

Luis Miranda-Moreno; B.Sc., M.Eng.(Mexico), Ph.D.(Wat.)

Colin Rogers; B.A.Sc., M.A.Sc.(Wat.), Ph.D.(Syd.), P.Eng.

Yixin Shao; B.Sc., M.S.(Tongji), Ph.D.(N'western), P.Eng., F.A.C.I.

Assistant Professors

Jinxia Liu; BE/ME(Tianjin), ME(Rensselaer Poly.), Ph.D.(Purd.)

Omid M. Rouhani; B.Sc., M.Sc.(Sharif Univ. of Technology), M.Sc., Ph.D.(Calif., Davis)

Adjunct Professors

Sofia Babarutsi, Paul Rodrigue, William Taylor

11.5.5 Master of Engineering (M.Eng.); Civil Engineering (Thesis) (45 credits)

Thesis Courses (27 credits)

CIVE 630	(3)	Thesis Research 1
CIVE 631	(3)	Thesis Research 2
CIVE 632	(3)	Thesis Research 3
CIVE 633	(6)	Thesis Research 4
CIVE 634	(6)	Thesis Research 5
CIVE 635	(6)	Thesis Research 6

Required Course

1 credit:

CIVE 662	(1)	Masters Research Seminar

Complementary Courses (17 credits)

(minimum 17 credits)

A minimum of five courses at the 500 or 600 lev

1 credit:

(1) Masters Research Seminar

Toxicology:

Principles of Toxicology

McConnell Engineering Building, Room 633
3480 University Street
Montreal QC H3A 0E9
Canada
Telephone: 514-398-7344 or 514-398-1406
Fax: 514-398-4470
Email: *grad.ece@mcgill.ca*
Website: *www.mcgill.ca/ece*

11.6.2 About Electrical and Computer Engineering

The Department offers programs of graduate studies leading to a degree of **Master of Engineering** (thesis or project/non-thesis) or **Doctor of Philosophy**.

The research interests and facilities of the Department are very extensive, involving more than 50 faculty members and 300 postgraduate students. The major activities are divided into the following groups:

- Bioelectrical Engineering;
- Telecommunications and Signal Processing;
- Systems and Control;
- Integrated Circuits and Systems;
- Nano-Electronic Devices and Materials;
- Photonic Systems;
- Computational Electromagnetics;
- Power Engineering;
- Intelligent Systems;
- Software Engineering.

The Department is equipped with state-of-the-art experimental laboratories and there are numerous multidisciplinary research projects, so students are provided with an ideal environment to develop new technologies, discover novel phenomena, and design revolutionary devices.

Research Facilities

The Department has extensive laboratory facilities for all its main research areas. In addition, McGill University often collaborates with other institutions for teaching and research.

- The laboratories for research in Robotics, Control, and Vision are in the *Centre for Intelligent Machines* (CIM).
- Telecommunications laboratories focus their work on signal processing, broadband communications, and networking; these laboratories form part of the *Centre for Advanced Systems and Communications* (SYTACom), a McGill University Research Centre devoted to fostering innovation in the area of communications systems and technologies via advanced research and training of highly qualified personnel.
- The *Integrated Microsystems Laboratory* (iML) supports research in FPGAs, MEMS, micro- and nano-systems, VLSI architectures for digital communications and signal processing, mixed signal, RF, and microwave integrated circuits and components, simulation of integrated circuits and microsystems, integrated antennas, design for testability, reconfigurable computing, high-speed circuits, and packaging.
- Antenna and microwave research, and optical fibre and integrated optics research are carried out in a fully equipped facility.
- The *Photonics Systems* laboratory includes continuous wave and femtosecond Ti: Sapphire lasers, diode lasers, extensive optics and optomechanics, and sophisticated electronic and imaging equipment.
- The solid state f

by the professor from whose grant the assistantship is paid. A good part, but not necessarily all, of this work can be used for preparing a thesis. There is no special application form for graduate assistantships; all applicants who indicate a need for support on their application forms will be considered.

Teaching Assistantships: Graduate students, with the approval of their supervisors, may also undertake teaching assistantships for additional remuneration. These are awarded at the beginning of the term. The Department can make no prior commitments.

Graduate students can also receive financial aid through fellowships, loans, or bursaries. For more information, please refer to *www.mcgill.ca/gps/funding/students-postdocs*, or contact:

Graduate and Postdoctoral Studies, McGill University
James Administration Building, Room 400
845 Sherbrooke Street West
Montreal QC H3A 0G4

section 11.6.5: Master of Engineering (M.Eng.); Electrical Engineering (Thesis) (46 credits)

The Master of Engineering degree (thesis option) involves graduate-level courses and an externally examined thesis. This program is research oriented and the thesis is expected to involve a thorough examination of a topic of current interest in the research area within the Department. Undertaking this program at McGill University provides students with an opportunity to conduct intensive research under the supervision of researchers who are leaders in their field. The program is an ideal preparation for a Ph.D. degree or an industrial research career.

section 11.6.6: Master of Engineering (M.Eng.); Electrical Engineering (Thesis) — Computational Science and Engineering (47 credits)

This program is currently under review and may not be offered. Please inquire.

section 11.6.7: Master of Engineering (M.Eng.); Electrical Engineering (Non-Thesis) (45 credits)

The Master of Engineering degree (project option) involves graduate-level courses and an internally examined research project. The program is oriented more toward professional development than the thesis option. The project is of significantly less scope than a thesis, and includes options such as a technical review, a design project, or a small-scale research project. Students are provided with a very solid background in electrical and computer engineering, both in terms of breadth across the entire field and depth in the area of specialty. Graduates frequently pursue careers in research and development. A part-time program is possible.

section 11.6.8: Doctor of Philosophy (Ph.D.); Electrical Engineering

The Ph.D. degree recognizes a significant novel research contribution that is described in an externally examined thesis. Students who are admitted to this program normally have a master's degree. Research is conducted under the supervision of a faculty member. The Department provides an excellent environment for conducting research, with supervision by internationally renowned researchers and access to state-of-the-art experimental facilities. Graduates from the program most commonly pursue research and teaching careers in academia or research careers in industrial labs.

11.6.3 Electrical and Computer Engineering Admission Requirements and Application Procedures

11.6.3.1 Admission Requirements

English Proficiency Requirement: Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in English. Accepted English language tests and minimum test score requirements can be found on our *website*. Official results must be received before the application deadlines.

GRE: Submission of *GRE* (General Aptitude Test) scores is not mandatory. Applicants who have written the GRE are welcome to submit their scores for consideration.

M.Eng. Degree (Admission Requirements)

The applicant must be the graduate of a recognized university and hold a bachelor's degree or its equivalent, as determined by McGill, in Electrical, Computer, or Software Engineering or a closely related field. An applicant holding a degree in another field of engineering or science will be considered but a Qualifying year may be required to make up any deficiencies. The applicant must have a high academic achievement: a standing equivalent to a **cumulative grade point average (CGPA) of 3.0 out of 4.0, or a GPA of 3.2 out of 4.0 for the last two full-time academic years or equivalent**. Satisfaction of these general requirements does not guarantee admission. Admission to graduate studies is limited and acceptance is on a very competitive basis.

Ph.D. Degree (Admission Requirements)

In addition to satisfying the requirements for the M.Eng. program, candidates must hold a suitable master's degree from a recognized university. The applicant must have a high academic achievement: a standing equivalent to a cumulative grade point average (CGPA) of 3.0 out of 4.0. Satisfaction of these general requirements does not guarantee admission. Admission to graduate studies is limited and acceptance is on a very competitive basis.

11.6.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at *www.mcgill.ca/gradapplicants/apply*.

See *University Regulations and Resources* > *Graduate* > *Graduate Admissions and Application Procedures* > *: Application Procedures* for detailed application procedures.

The Department accepts most of its graduate students for September; the chance of acceptance for January is significantly lower.

11.6.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Area of Research and Applicant Profile Form – available at *www.mcgill.ca/ece/admissions/graduate/apply*
- *GRE* – the General Aptitude Test is optional.

11.6.3.3 Application Deadlines

The application deadlines listed here are set by the Electrical and Computer Engineering Department and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill academic unit's website; please consult the list at *www.mcgill.ca/gps/contact/graduate-program*.

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Jan. 15
Winter: Oct. 15	Winter: Sept. 1	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

All supporting documents must be uploaded to the online application system (*uApply*) by the application deadlines.

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

11.6.4 Electrical and Computer Engineering Faculty

Chair

Andrew G. Kirk

Associate Chair, Academic

Roni Khazaka

Associate Chair, Undergraduate Studies

Jonathan P. Webb

Associate Chair, Graduate Programs

Milica Popovich

Emeritus Professors

Eric L. Adler; B.Sc.(Lond.), M.A.Sc.(Tor.), Ph.D.(McG.), F.I.E.E.E., Eng.

Pierre R. Bélanger; B.Eng.(McG.), S.M., Ph.D.(MIT), F.I.E.E.E., Eng.

Maier L. Blostein; B.Eng., M.Eng.(McG.), Ph.D.(Ill.), F.I.E.E.E., Eng.

Clifford H. Champness; M.Sc.(Lond.), Ph.D.(McG.)

Francisco D. Galiana; B.Eng.(McG.), S.M., Ph.D.(MIT), F.I.E.E.E., Eng.MIT), FMcG.), F

Professors

ECSE 691	(4)	Thesis Research 1
ECSE 692	(4)	Thesis Research 2
ECSE 693	(4)	Thesis Research 3
ECSE 694	(4)	Thesis Research 4
ECSE 695	(4)	Thesis Research 5
ECSE 696	(4)	Thesis Research 6
ECSE 697	(4)	Thesis Research 7

Required Course (1 credit)

ECSE 670D1	(.5)	Computational Science Engineering Seminar
ECSE 670D2	(.5)	Computational Science Engineering Seminar

Complementary Courses (18 credits)

(minimum 18 credits)

Six courses at the graduate level (500 or above) are required (minimum 18 credits), with a grade of B- or better. Two courses (minimum 6 credits) from List A, and two courses (minimum 6 credits) from List B. At least two of the courses taken from Lists A and B must be from outside the Department of Electrical and Computer Engineering.

List A: Scientific Computer Courses

CIVE 602	(4)	Finite Element Analysis
COMP 522	(4)	Modelling and Simulation
COMP 540	(3)	Matrix Computations
COMP 566	(3)	Discrete Optimization 1
MATH 578	(4)	Numerical Analysis 1
MATH 579	(4)	Numerical Differential Equations

List B: Applications and Specialized Methods Courses

ATOC 512	(3)	Atmospheric and Oceanic Dynamics
ATOC 513	(3)	Waves and Stability
ATOC 515	(3)	Turbulence in Atmosphere and Oceans
CIVE 514	(3)	Structural Mechanics
CIVE 572	(3)	Computational Hydraulics
CIVE 603	(4)	Structural Dynamics
COMP 557	(3)	Fundamentals of Computer Graphics
COMP 558	(3)	Fundamentals of Computer Vision
COMP 567	(3)	Discrete Optimization 2
COMP 621	(4)	Program Analysis and Transformations
COMP 642	(4)	Numerical Estimation Methods
COMP 767	(4)	Advanced Topics: Applications 2
ECSE 507	(3)	Optimization and Optimal Control
ECSE 532	(3)	Computer Graphics
ECSE 547	(3)	Finite Elements in Electrical Engineering
ECSE 549	(3)	Expert Systems in Electrical Design

MATH 555	(4)	Fluid Dynamics
MATH 560	(4)	Optimization
MATH 761	(4)	Advanced Topics in Applied Mathematics 1
MECH 533	(3)	Subsonic Aerodynamics
MECH 537	(3)	High-Speed Aerodynamics
MECH 538	(3)	Unsteady Aerodynamics
MECH 539	(3)	Computational Aerodynamics
MECH 541	(3)	Kinematic Synthesis
MECH 572	(3)	Introduction to Robotics
MECH 573	(3)	Mechanics of Robotic Systems
MECH 576	()	
MECH 577	(3)	Optimum Design
MECH 610	(4)	Fundamentals of Fluid Dynamics
MECH 620	(4)	Advanced Computational Aerodynamics
MECH 632	(4)	Advanced Mechanics of Materials
MECH 642	(4)	Advanced Dynamics
MECH 650	(4)	Fundamentals of Heat Transfer
MECH 654	(4)	Compt. Fluid Flow and Heat Transfer

11.6.7 Master of Engineering (M.Eng.); Electrical Engineering (Non-Thesis) (45 credits)

section 11.7.9: Master of Management (M.M.); Manufacturing Management (Non-Thesis) (56 credits)

The Master in Manufacturing Management (M.M.M.) program attracts business professionals from around the world who wish to pursue a career in the effective management of global operations and supply chain. It is a professionally-oriented graduate program offered jointly through the Faculties of Engineering and Management, aimed at those candidates with engineering or science backgrounds.

In just eleven months of academic studies, M.M.M. students sharpen their expertise in supply chain and operations through an intensive program that includes:

- A challenging curriculum
- Extensive industrial interaction
- Innovative research projects

Additionally, students are exposed to the latest trends and developments in management and participate in professional development seminars to leverage their communication and leadership skills. After less than one year of studies, participants complete a paid work term at an industrial location. This is a unique opportunity to work on a real-world project with an M.M.M. partner company in North America.

section 11.7.10: Master of Science (M.Sc.); Mechanical Engineering (Thesis) (45 credits)

Please consult the Department for more information on this program.

section 11.7.11: Doctor of Philosophy (Ph.D.); Mechanical Engineering

In the Ph.D. program, students are required to demonstrate a significant new contribution to their field of research, as documented in an externally reviewed thesis. The research is carried out under the supervision of professors who are leaders in their field. Since research in Mechanical Engineering is often interdisciplinary in nature, it is common for Ph.D. students to have a co-supervisor in addition to their principle supervisor. Graduates from this program typically proceed to careers in research in either industrial or academic environments.

11.7.3 Mechanical Engineering Admission Requirements and Application Procedures

11.7.3.1 Admission Requirements

The general rules of Graduate and Postdoctoral Studies apply. Candidates who come from other institutions are expected to have an academic background equivalent to the undergraduate curriculum in mechanical engineering at McGill or to make up any deficiencies in a Qualifying year.

Applicants to the M.Eng. (Thesis) program must hold an undergraduate degree (or equivalent) in Engineering. Applicants who hold an undergraduate degree in a non-Engineering discipline—typically the Physical Sciences—may apply for the M.Sc. (Thesis) program, which is governed by the same regulations as the M.Eng. (Thesis) program.

Applicants to the M.Eng. (Non-Thesis) program must hold an undergraduate degree (or equivalent) in Mechanical Engineering.

Applicants to the M.Eng. (Aerospace) program must hold an undergraduate degree (or equivalent) in Engineering. Applicants must be proficient in French.

Applicants to the Ph.D. program must have successfully completed a master's degree program (or equivalent) in Engineering or the Physical Sciences. In exceptional circumstances, students with outstanding performance at the bachelor's level may be offered direct entry into the Ph.D. program (Ph.D. 1).

In the case of all programs, applicants must have successfully completed their prior degree(s) with a minimum CGPA equivalent to 3.3 on a scale of 4.0. Satisfaction of these minimum requirements does not guarantee admission. Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit official results of either a *TOEFL* or an *IELTS* test. The minimum score required is 92 for the Internet-based TOEFL test, with each component score not less than 20, or a minimum overall band of 7.0 on the IELTS test.

11.7.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at *www.mcgill.ca/gradapplicants/apply*.

See *University Regulations and Resources* > *Graduate* > *Graduate Admissions and Application Procedures* > *: Application Procedures* for detailed application procedures.

Please consult *www.mcgill.ca/mecheng/grad* for further details on required application documents.

11.7.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- two official Referee Letters
- Personal Statement – one page
- Curriculum Vitae – please include a list of publications, if relevant

Professors

Luc Mongeau; B.Sc., M.Sc.(École Poly., Montr.), Ph.D.(Penn St.), ing. (*Canada Research Chair*)

Meyer Nahon; B.Sc.(Qu.), M.Sc.(Tor.), Ph.D.(McG.), ing., A.F.A.I.A.A.

Damiano Pasini; M.Sc.(Pavia), Ph.D.(Brist.), ing.

Inna Sharf; B.A.Sc., Ph.D.(Tor.)

Associate Professors

Francois Barthelat; M.Sc.(Roch.), Ph.D.(N'western)

Jeffrey M. Bergthorson; B.Sc.(Manit.), M.Sc., Ph.D.(Calif. Tech.), P.Eng.

David L. Frost; B.A.Sc.(Br. Col.), M.S., Ph.D.(Calif. Tech.), P.Eng.

Andrew J. Higgins; B.Sc.(Ill.), M.S., Ph.D.(Wash.)

Michael Kokkolaras; Dipl.Ing.(TUM), Ph.D.(Rice)

Jozsef Kövecses; M.Sc.(U. Miskolc), Ph.D.(Hung. Acad. Sci.), ing.

Tim Lee; M.S.(Portland St.), Ph.D.(Idaho)

Rosaire Mongrain; B.Sc., M.Sc.(Montr.), Ph.D.(École Poly., Montr.), ing. (*William Dawson Scholar*)

Laurent Mydlarski; B.Sc.(Wat.), Ph.D.(Cornell)

Siva Nadarajah; B.Sc.(Kansas), M.S., Ph.D.(Stan.)

Evgeny V. Timofeev; M.Sc., Ph.D.(S.T.U. St. Petersburg), Eng., A.F.A.I.A.A.

Srikar T. Vengallatore; B.Tech.(B.H.U), Ph.D.(MIT) (*Canada Research Chair*)

Assistant Professors

Mark Driscoll; B.Eng.(McG.), M.Sc.(Montr.), Ph.D.(École Poly., Montr.), P.Eng.

James R. Forbes; Ph.D.(Tor), B.Eng.(Wat.)

Mathias Legrand; M.Sc., Ph.D.(École Centrale, Nantes)

Xinyu Liu; B.Eng., M.Eng.(Harbin), Ph.D.(Tor.)

Jovan Nedi ; M.Eng., Ph.D.(Imperial Coll.)

Yaoyao Fiona Zhao; B.Eng.(B.I.T.), M.Eng., Ph.D.(Auck.)

Adjunct Professors

Farbod Alijani

Helmi Attia

Olivier Bertrand

Gilles Bourque

Luca Cortelezzi

Farhang Daneshmand

Mouhab Meshreki

Alireza Najafi-Yazdi

Aditya Paranjape

Peter Radziszewski

Gilles Soulez

Course Lecturers

Marwan Kanaan

Richard Klopp

Sudarshan Martins

Complementary Courses (16 credits)

A minimum of 16 credits (500 level or above), at least 8 of which must be from within the Faculty of Engineering. Two courses (minimum 6 credits) from List A, and two courses (minimum 6 credits) from List B. At least two of the courses taken from Lists A and B must be from outside the Department of Mechanical Engineering. FACC courses will not count toward the complementary course credits.

List A - Scientific Computing Courses:

CIVE 602	(4)	Finite Element Analysis
COMP 522	(4)	Modelling and Simulation
COMP 540	(3)	Matrix Computations
COMP 566	(3)	Discrete Optimization 1
MATH 578	(4)	Numerical Analysis 1
MATH 579	(4)	Numerical Differential Equations

List B - Applications and Specialized Methods Courses:

ATOC 512	(3)	Atmospheric and Oceanic Dynamics
ATOC 513	(3)	Waves and Stability
ATOC 515	(3)	Turbulence in Atmosphere and Oceans
CIVE 572	(3)	Computational Hydraulics
CIVE 603	(4)	Structural Dynamics
COMP 557	(3)	Fundamentals of Computer Graphics
COMP 558	(3)	Fundamentals of Computer Vision
COMP 567	(3)	Discrete Optimization 2
COMP 621	(4)	Program Analysis and Transformations
COMP 642	(4)	Numerical Estimation Methods
COMP 767	(4)	Advanced Topics: Applications 2
ECSE 507	(3)	Optimization and Optimal Control
ECSE 532	(3)	Computer Graphics
ECSE 547	(3)	Finite Elements in Electrical Engineering
ECSE 549	(3)	Expert Systems in Electrical Design
MATH 555	(4)	Fluid Dynamics
MATH 560	(4)	Optimization
MATH 761	(4)	Advanced Topics in Applied Mathematics 1
MECH 533	(3)	Subsonic Aerodynamics
MECH 537	(3)	High-Speed Aerodynamics
MECH 538	(3)	Unsteady Aerodynamics
MECH 539	(3)	Computational Aerodynamics
MECH 541	(3)	Kinematic Synthesis
MECH 572	(3)	Introduction to Robotics
MECH 573	(3)	Mechanics of Robotic Systems
MECH 576	()	
MECH 577	(3)	Optimum Design
MECH 610	(4)	Fundamentals of Fluid Dynamics
MECH 620	(4)	Advanced Computational Aerodynamics

MECH 632	(4)	Advanced Mechanics of Materials
MECH 642	(4)	Advanced Dynamics
MECH 650	(4)	Fundamentals of Heat Transfer
MECH 654	(4)	Compt. Fluid Flow and Heat Transfer

11.7.7 Master of Engineering (M.Eng.); Mechanical Engineering (Non-Thesis) (45 credits)

Research Project (13 credits)

MECH 603	(9)	M. Eng. Project 1
MECH 604	(3)	M. Eng. Project 2
MECH 609	(1)	Seminar

Note: Industrial liaison is encouraged in these courses taken near the end of the program.

Required Courses (16 credits)

MECH 605	(4)	Applied Mathematics 1
MECH 610	(4)	Fundamentals of Fluid Dynamics
MECH 632	(4)	Advanced Mechanics of Materials
MECH 642	(4)	Advanced Dynamics

Complementary Courses (16 credits)

A minimum of 16 credits (500, 600, or 700 level) from the Faculty of Engineering may be selected by the student, based on interest and the choice of area of concentration. Courses at the graduate level from other faculties may also be taken, with prior approval from the student's project supervisor and the Graduate Program Director. A maximum of 3 credits of FACC courses at the 500, 600, or 700 level may be credited toward the degree.

11.7.8 Master of Engineering (M.Eng.); Aerospace Engineering (Non-Thesis) (45 credits)

The M.Eng. Aerospace Degree is offered to the students who wish to specialize in the general area of aerospace engineering. This degree is given in conjunction with Concordia University, École Polytechnique, Université Laval, Université de Sherbrooke, and École de Technologie Supérieure. Students registered at McGill are required to take two courses from two other institutions.

Depending on their background, students would specialize in one of the four areas:

1. Aeronautics and Space Engineering

2. Avionics and Control

3. Aerospace Materials and Structures

4. Virtual Environment

Required Courses (9 credits)

MECH 687	(3)	Aerospace Case Studies
MECH 688	(6)	Industrial Stage

Complementary Courses (36 credits)

The other courses, depending on the area of concentration, will be chosen in consultation with an Aerospace Engineering Adviser. A maximum of 3 credits of FACC courses at the 500, 600, or 700 level may be credited toward the degree.

gTm(3. 0jMaster of Engineering (M.Eng.); Manufacturing Management (Non-Thesis) (45 credits))T(Thd8.1 85 Tsm ofTm(8.1 Tf1 0 0 5.54.52n

MECH 529	(3)	Discrete Manufacturing Systems
MGSC 578	(3)	Simulation of Management Systems
MGSC 615	(3)	Procurement and Distribution

11.7.10 Master of Science (M.Sc.); Mechanical Engineering (Thesis) (45 credits)

Applicants who hold an undergraduate degree in a non-Engineering discipline – typically the Physical Sciences – may apply for the M.Sc. (Thesis) program, which is governed by the same regulations as the M.Eng. (Thesis) program.

Thesis Courses (28 credits)

M.Eng. Thesis Literature Re

Montreal QC H3A 0C5
Canada
Email: *barbara.hanley@mcgill.ca*
Website: *www.mcgill.ca/minmat*

Mining Engineering
Telephone: 514-398-2215
Fax: 514-398-7099

Materials Engineering
Telephone: 514-398-4383
Fax: 514-398-4492

11.8.2 About Mining and Materials Engineering

Graduate programs leading to **M.Eng.**, **M.Sc.**, and **Ph.D.** research degrees are available in the areas of:

- Geomechanics;
- Mining Environments;
- Strategic Mine Planning and Optimization;
- Stochastic Modelling;
- Operations Research;
- Mineral Economics;
- Materials Handling;
- Process Metallurgy;
- Computational Thermodynamics;
- Hydrometallurgy;
- Effluent and Waste Treatment;
- Mineral Processing;
- Metal Casting and CFD Modelling;
- Surface Engineering;
- Composites;
- Ceramics;
- Electron Microscopy;
- Automotive and Aerospace Materials;
- Biomaterials;
- Nanomaterials;
- Nanoelectronic Materials;
- Multiscale Modelling of Materials;
- Electronic and Solar Cell Materials.

Course programs leading to the M.Eng. (Project) degree in Mining or Materials Engineering and the Graduate Diploma in Mining Engineering are also available.

Special programs are available for those holding degrees in subjects other than Materials or Mining Engineering (e.g., Chemical, Civil, or Mechanical Engineering, Chemistry, Physics, Geology).

section 11.8.5: Master of Engineering (M.Eng.); Mining and Materials Engineering (Thesis) (45 credits)

The M.Eng. (Thesis) degree is open to graduates holding the B.Eng. degree or its equivalent in Materials Engineering, Mining Engineering, or other related engineering fields.

section 11.8.6: Master of Science (M.Sc.); Mining and Materials Engineering (Thesis) (45 credits)

1. an excellent academic standing for their undergraduate degree;
2. been in the master's program for less than 12 months;
3. passed with the minimum CGPA of 3.6 at least three of the required master's courses, and given one seminar with a minimum grade of A-;
4. made good progress with their research;
5. obtained a strong letter of recommendation from their supervisor.

Direct Entry from B.Eng. to Ph.D.

Exceptional B.Eng. and B.Sc. graduates may be admitted directly to the Ph.D. program. The Ph.D. 1 students admitted through this process are required to complete at least four graduate-level courses.

M.Eng. (Project) Degrees

section 11.8.7: Master of Engineering (M.Eng.); Mining and Materials Engineering (Non-Thesis) (45 credits)

The Master of Engineering (Project) program (Materials option) is primarily designed to train people with appropriate engineering or scientific backgrounds to allow them to work effectively in the metals and materials industries. The Master of Engineering (Project) program (Mining option) is primarily designed for graduates from mining engineering programs who have received adequate academic training in modern mining technology, mineral economics, computer programming, and probabilities and statistics.

section 11.8.8: Master of Engineering (M.Eng.); Mining and Materials Engineering (Non-Thesis) — Environmental Engineering (45 credits)

This interdepartmental graduate program leads to a master’s degree in Environmental Engineering. The objective of the program is to train environmental professionals at an advanced level. The program is designed for individuals with an undergraduate degree in engineering. This non-thesis degree falls within the M.Eng. and M.Sc. programs, which are offered in the Departments of Bioresource, Chemical, Civil, and Mining and Materials Engineering. The Environmental Engineering program emphasizes interdisciplinary fundamental knowledge, practical perspectives, and awareness of environmental issues through a wide range of technical and non-technical courses offered by collaborating departments and faculties at the University. Students are strongly encouraged to consult with the Graduate Program Director prior to enrolling in the program.

section 11.8.9: Doctor of Philosophy (Ph.D.); Mining and Materials Engineering

Please consult the Department for more information about the Ph.D.

section 11.8.10: Graduate Diploma (Gr. Dip.); Mining Engineering (30 credits)

This program normally requires one academic year of full-time study to complete. Candidates are required to take an integrated group of courses based on their academic background.

11.8.3 Mining and Materials Engineering Admission Requirements and Application Procedures

11.8.3.1 Admission Requirements

The **Graduate Diploma in Mining Engineering** is open to graduates with suitable academic standing in any branch of engineering or science. It is designed to provide a sound technical mining engineering background to candidates intending to work in the minerals industry.

The **M.Eng. (Thesis)** degree is open to graduates holding the B.Eng. degree or its equivalent in Materials Engineering, Mining Engineering, or other related engineering fields.

The **M.Sc. (Thesis)** degree is open to graduates holding the B.Sc. degree in Chemistry, Materials Science, Physics, Geology, or related fields.

The **Master of Engineering (Project) (Materials option)** is primarily designed to train people with appropriate engineering or scientific backgrounds to allow them to work effectively in the metals and materials industries. Industrial experience is favourably viewed for entrance into the program, but is not considered a necessity.

The **Master of Engineering (Project) (Mining option)** is primarily designed for graduates from mining engineering programs who have received adequate academic training in modern mining technology, mineral economics, computer programming, and probabilities and statistics. Students without this academic training must follow a Qualifying term. Industrial experience is fav

See *University Regulations and Resources* > *Graduate* > *Graduate Admissions and Application Procedures* > *: Application Procedures* for detailed application procedures.

11.8.3.3 Application Deadlines

The application deadlines listed here are set by the Department of Mining and Materials Engineering and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at *www.mcgill.ca/gps/contact/graduate-program*.

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Jan. 15
Winter: Oct. 15	Winter: Sept. 1	Winter: Same as Canadian/International
Summer: Jan. 15	Summer: Jan. 15	Summer: Jan. 15

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

11.8.4 Mining and Materials Engineering Faculty

Department Chair

George P. Demopoulos

Associate Chair, Student Affairs

Richard Chromik

Associate Chair & Graduate Program Director

Mathieu Brochu

Graduate Program Coordinator

Barbara Hanley

Director, Mining Engineering Program

Hani S. Mitri (

Associate Professors

In-Ho Jung; B.Sc.(POSTECH), Ph.D.(École Poly., Montr.) (*William Dawson Scholar*)

Mustafa Kumral; B.Eng.(Hacettepe), M.Eng.(Cukurova), Ph.D.(Leeds)

Frank Mucciardi; B.Eng., M.Eng., Ph.D.(McG.), Eng.

Showan Nazhat; B.Eng., M.Sc., Ph.D.(Lond.)

Mihriban Pekguleryuz; B.Sc., M.Eng.(Flor.), Ph.D.(McG.)

Nathaniel Quitoriano; B.S.(Calif., Berk.), Ph.D.(MIT)

Kristian Waters; M.Eng., M.Sc.(UMIST), Ph.D.(Birm.) (*on sabbatical as of Sept. 2016*)

Assistant Professors

Kirk Bevan; Ph.D.(Purd.)

Agus Pulung Sasmito; B.Eng.(Univ. Gadjah Mada), Ph.D.(NUS), Mech. Eng.

Jun Song; M.Sc., Ph.D.(Princ.)

Adjunct Professors

Bruno Benedetti, Mostafa Benzaazoua, Marc Bétournay, Robin A.L. Drew, Michel Gamache, Abdelbaset Guerfi, Bryn Harris, Robert Harrison, Ahmad Hemami, Arun Mujumdar, Jan Nesset, Marco Quirion, Denis Thibodeau, Karim Zaghib

Faculty Lecturer

Florence Paray; B.Eng.(CSP), M.Eng., Ph.D.(McG.)

Course Lecturers

Yves Buro

Marco Quirion

Shahe Shnorhokian

Co-op Program Liaison Officers

Monika Teresa Skonieczny (Mining)

Genevieve Snider (Materials)

11.8.5 Master of Engineering (M.Eng.); Mining and Materials Engineering (Thesis) (45 credits)

Thesis Courses (27 credits)

MIME 690	(6)	Thesis Research 1
MIME 691	(3)	Thesis Research 2
MIME 692	(6)	Thesis Research 3
MIME 693	(3)	Thesis Research 4
MIME 694	(6)	Thesis Research 5
MIME 695	(3)	Thesis Research 6

Required Seminar (6 credits)

MIME 601	(0)	Engineering Laboratory Practice

6 credits from the following courses:

MIME 670	(6)	Research Seminar 1
MIME 672D1*	(3)	Rock Mechanics Seminar

MIME 672D2*	(3)	Rock Mechanics Seminar
MIME 673	(6)	Mining Engineering Seminar

* Note: Students must register for MIME 672D1 and MIME 672D2 in consecutive terms.

Complementary Courses (12 credits)

12 credits at the 500-level or higher selected from within and/or outside the department in consultation with the student's supervisor and/or Advisory Committee.

11.8.6 Master of Science (M.Sc.); Mining and Materials Engineering (Thesis) (45 credits)

Thesis Courses (27 credits)

MIME 690	(6)	Thesis Research 1
MIME 691	(3)	Thesis Research 2
MIME 692	(6)	Thesis Research 3
MIME 693	(3)	Thesis Research 4
MIME 694	(6)	Thesis Research 5
MIME 695	(3)	Thesis Research 6

Required Seminar (6 credits)

MIME 601	(0)	Engineering Laboratory Practice

6 credits from the following courses:

* Note: Students must register for MIME 672D1 and MIME 672D2 in consecutive terms.

MIME 670	(6)	Research Seminar 1
MIME 672D1*	(3)	Rock Mechanics Seminar
MIME 672D2*	(3)	Rock Mechanics Seminar
MIME 673	(6)	Mining Engineering Seminar

Complementary Courses (12 credits)

12 credits at the 500 level or higher from within and/or outside the department in consultation with the student's supervisor and/or Advisory Committee.

11.8.7 Master of Engineering (M.Eng.); Mining and Materials Engineering (Non-Thesis) (45 credits)

Students registered in this program specialize either in Mining Engineering or Materials Engineering.

Research Project (15 credits)

MIME 628	(6)	Mineral Engineering Project 1
MIME 629	(6)	Mineral Engineering Project 2
MIME 634	(3)	Mineral Engineering Project 3

Required Courses (6 credits)

MIME 601	(0)	Engineering Laboratory Practice

AND

6 credits from the following courses:

One of the following courses:

BREE 533	(3)	Water Quality Management
CIVE 686	(4)	Site Remediation

Environmental Impact Course

One of the following courses:

GEOG 501	(3)	Modelling Environmental Systems
GEOG 551	(3)	Environmental Decisions

or an approved 500-, 600-, or 700-level alternative.

Environmental Policy Course

URBP 506	(3)	Environmental Policy and Planning

or an approved 500-, 600-, or 700-level alternative.

Elective Courses (11 credits)

(minimum 11 credits)

Another project course and/or Engineering or non-Engineering 500-, 600-, or 700-level course subject to approval of the Department.

The relevant Project course in Mining and Materials Engineering is the following:

MIME 629	(6)	Mineral Engineering Project 2

11.8.9 Doctor of Philosophy (Ph.D.); Mining and Materials Engineering

A candidate for this degree must pass a minimum of two courses assigned by the Department. These are selected on the basis of the student's previous academic training and research interests. The candidate must also pass a safety training course in the first year of his/her Ph.D. registration. The candidate is required to participate in an appropriate Research Seminar course and is expected to take a preliminary examination within the first year of his/her Ph.D. registration.

The candidate must submit an acceptable thesis based upon successfully completed research and must satisfy the examiners in an oral examination of the thesis.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

11.8.10 Graduate Diploma (Gr. Dip.); Mining Engineering (30 credits)

Required Course (6 credits)

MIME 601	(0)	Engineering Laboratory Practice
MIME 673	(6)	Mining Engineering Seminar

Complementary Courses (24 credits)

24 credits of courses at the 500 level or higher selected from within and/or outside the department in consultation with the Program Adviser.

11.9 Urban Planning

11.9.1 Location

School of Urban Planning
Macdonald Harrington Building, Room 400
815 Sherbrooke Street West
Montreal QC H3A 0C2
Canada
Telephone: 514-398-4075
Fax: 514-398-8376
Email: *admissions.planning@mcgill.ca*
Website: *www.mcgill.ca/urbanplanning*

11.9.2 About Urban Planning

Urban planning is the process by which a community shapes its environment to meet its needs and realize its aspirations. Urban planning is also the profession of those who facilitate this process. While the practice of planning is as old as the cities themselves, the Urban Planning profession is only about a century old. In the late 19th and early 20th centuries, architects, landscape architects, engineers, government reformers, lawyers, public health specialists, and others joined forces to tackle the serious social and environmental problems of the industrial city. They created new techniques and institutions to improve living conditions and decision-making processes, with an eye to impro

Summer: N/A	Summer: N/A	Summer: N/A

Admission to graduate studies is competitive; accordingly, late and /or incomplete applications are considered only as time and space permit.

11.9.4 Urban Planning Faculty

Director
Lisa Bornstein ( )
David Farley; B.Arch.(McG.), M.Arch., M.C.P.(Harv.)
Jane Matthews-Glenn; B.A., LL.B.(Qu.), D. en droit(Stras.)

Required Courses (27 credits)

URBP 609	(3)	Planning Graphics
URBP 612	(3)	History and Theory of Planning
URBP 622	(6)	Planning Studio 1
URBP 623	(3)	Planning Studio 2
URBP 624	(6)	Planning Studio 3
URBP 633	(3)	Research Methods for Planners
URBP 635	(3)	Planning Law

Required Internship (6 credits)

URBP 628	(6)	Practical Experience

Complementary Courses (18 credits)

Students are encouraged to complete at least one course in each of the four areas of design, environment, housing, and transportation.

Group A

9-18 credits from the following:

ARCH 515	(3)	Sustainable Design
ARCH 517	(3)	Sustainable Residential Development
ARCH 520	(3)	Montreal: Urban Morphology
ARCH 564	(3)	Design for Development
ARCH 566	(3)	Cultural Landscapes Seminar
CIVE 540	(3)	Urban Transportation Planning
CIVE 561	(3)	Urban Activity, Air Pollution, and Health
GEOG 504	(3)	Industrial Restructuring - Geographic Implications
GEOG 525	(3)	Asian Cities in the 21st Century
URBP 501	(2)	Principles and Practice 1
URBP 504	(3)	Planning for Active Transportation
URBP 505	(3)	Geographic Information Systems
URBP 506	(3)	Environmental Policy and Planning
URBP 507*	(3)	Planning and Infrastructure
URBP 519*	(6)	Sustainable Development Plans
URBP 520*	(3)	Globalization: Planning and Change
URBP 530	(3)	Urban Environmental Planning
URBP 536	(2)	Current Issues in Transportation 1
URBP 537	(2)	Current Issues in Transportation 2
URBP 551	(3)	Contemporary Metropolitan Landscapes
URBP 556	(3)	Urban Economy: A Spatial Perspective
URBP 604	(3)	Urban Design Seminar 2: Advanced Topics
URBP 608	(3)	Advanced GIS Applications
URBP 619	(3)	Land Use and Transportation Planning
URBP 620	(3)	Transportation Economics
URBP 625	(2)	Principles and Practice 2

(2) Principles and Practice 3

9-12 credits from the following including at least one ARCH course and one URBP course:

Sustainable Design