Faculty of Engineering, including Peter Guo-hua Fu School of Architecture and School of Urban Planning (Graduate)

Programs, Courses and University Regulations

2021-2022

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

Welcome to Graduate and Postdoctoral Studies (GPS) at McGill. You are joining a community of world-class researchers and more than 10,000 graduate students in over 400 programs. GPS is here to support you from admissions through to graduation and beyond. McGill's approach to graduate education emphasises skills development; we cultivate your academic and professional growth through a variety of workshops, events and experiential learning opportunities. I invite you to consult the *GPS website* for information on the range of resources available to graduate students at McGill.

I would like to wish you all the best in your studies at McGill. We are here to mak

4 Graduate Studies at a Glance

Please refer to *University Regulations & Resources* > *Graduate* > *: Graduate Studies at a Glance* for a list of all graduate departments and degrees currently being offered.

5 Program Requirements

Refer to *University Regulations & Resources* >

i. Postdocs are subject to the responsibilities outlined at *mcgill.ca/students/srr* and must abide by the policies listed at *mcgill.ca/secretariat/policies-and-regulations*.

ii. Each academic unit hosting postdocs should clearly identify postdocs' needs and the means by which they will be met by the unit.

iii. Each academic unit should assess the availability of research supervision facilities, office space, and research funding before recruiting postdocs.

iv. Some examples of the responsibilities of the academic unit are:

- to verify the postdoc's eligibility period for registration;
- to provide postdocs with departmental policy and procedures that pertain to them;
- to facilitate the registration and appointment of postdocs;
- to assign departmental personnel the responsibility for postdoctoral affairs in the unit;
- to oversee and sign off on the Letter of Agreement for Postdoctoral Education;
- to ensure that each postdoc has a supervisor, lab and/or office space, access to research operating costs and necessary equipment;
- to include postdocs in departmental career and placement opportunities;
- to refer postdocs to the appropriate University policies and personnel for the resolution of conflict that may arise between a postdoc and a supervisor.

v. Some examples of the responsibilities of the supervisor are:

- to uphold and transmit to their postdocs the highest professional standards of research and/or scholarship;
- to provide research guidance;
- to meet regularly with their postdocs;
- to provide feedback on research submitted by the postdocs;
- to clarify expectations regarding intellectual property rights in accordance with the University's policy;
- to provide mentorship for career development;
- to prepare, sign, and adhere to a Letter of Agreement for Postdoctoral Education.

vi. Some examples of the responsibilities of postdocs are:

- to inform themselves of and adhere to the University's policies and/or regulations for postdocs as outlined at *mcgill.ca/gps/postdocs*, *mcgill.ca/students/srr* and the Graduate and Postdoctoral Studies *University Regulations and Resources*;
- to submit a complete file for registration to Enrolment Services;
- to sign and adhere to their Letter of Agreement for Postdoctoral Education;
- to communicate regularly with their supervisor;
- to inform their supervisor of their absences.

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 (Postdoctoral Fellows and Scholars) and HR policies and guidelines (Postdoctoral Researchers).

Approved by Senate, April 2000; revised May 2014; February 2020.

8.3 Vacation Policy for Graduate Students and Postdocs

Graduate students and Postdocs should normally be entitled to vacation leave equivalent to university holidays and an additional total of fifteen (15) working days in the year. Funded students and Postdocs with fellowships and research grant stipends taking additional vacation leave may have their funding reduced accordingly.

Council of FGSR April 23, 1999

8.4 Leave of Absence for Health and Parental/Familial Reasons

A leave of absence may be granted for maternity or parental reasons or for health reasons (see *University Regulations & Resources* > *Gr Tm(L& R18.6lstudents/srr)T4*

Students who have been granted such a leave will have to register for the term(s) in question and their registration will show as “leave of absence” on their record. No tuition fees will be charged for the duration of the authorized leave. Research supervisors are not obligated to remunerate students and Postdocs on leave. A summary table of various leave policies (paid or unpaid) for students and Postdocs paid from the Federal and Quebec Councils through fellowships or research grants is available at *mcgill.ca/gps/funding/getting-paid* under "Leave Policies and Form."

8.5ostdoPostdoctoral Research Trainees

10 Graduate Student Services and Information

Graduate students are encouraged to refer to *: Student Services and Information* for information on the following topics:

- Service Point
- Student Rights & Responsibilities
- Student Services – Downtown & Macdonald Campuses
- Residential Facilities
- Athletics and Recreation
- Ombudsperson for Students
- Extra-Curricular and Co-Curricular Activities
- Bookstore
- Computer Store
- Day Care

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

Refer to *University Regulations & Resources* >

12.1.2 About Peter Guo-hua Fu School of Architecture

M.Arch. (Professional) (Non-Thesis), M.Arch. (Post-professional) (Non-Thesis), Ph.D.

The Peter Guo-hua Fu School of Architecture at McGill University has a professional Master of Architecture program, a post-professional Master of Architecture program, and a Ph.D. program.

The **M.Arch. (Professional)** requires the equivalency of the B.Sc. (Architecture) degree for admittance.

- Master of Architecture (M.Arch.) Professional (Non-Thesis)(60 credits)

The M.Arch. (Professional) program is accredited by the Canadian Architectural Certification Board (CACB) and is recognised as accredited by the *National Council of Architectural Registration Boards* (NCARB) in the U.S.

The **M.Arch. (Post-professional)** and the **Ph.D. programs** are for study beyond the professional degree in architecture. These programs have been conceived to respond to the needs of graduates with some professional experience who wish to acquire more specialized knowledge in architecture. The M.Arch. (Post-professional) program reflects a McGill tradition of academic inquiry and research, and provides an opportunity for a select number of students and staff to work together. The program is organized in such a way as to meet the needs of the professional practitioner and the researcher, and is intended to extend traditional architectural education as well as address new issues.

There are two areas of study in the M.Arch. (Post-professional) program:

- Architectural History and Theory
- Urban Design and Housing

Information concerning the Ph.D. program, the duration of all programs offered, documents required of applicants, etc., may be obtained at *mcgill.ca/architecture*.

Architectural Certification in Canada

In Canada, all provincial associations recommend a degree from an accredited professional degree program as a prerequisite for licensure. The *CACB*, which is the sole agency authorized to accredit Canadian professional degree programs in architecture, recognizes two types of accredited degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a six-year, three-year, or two-year term of accreditation, depending on its degree of conformance with established educational standards.

Master's degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree, which, when earned sequentially, comprise an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

Since all provincial associations in Canada recommend any applicant for licensure to have graduated from a CACB-accredited program, obtaining such a degree is an essential aspect of preparing for the professional practice of architecture. While graduation from a CACB-accredited program does not assure registration, the accrediting process is intended to verify that each accredited program substantially meets those standards that, as a whole, comprise an appropriate education for an architect.

Please note that the M.Arch. (Post-professional) degree is not a professional degree and does not satisfy the requirements for certification with the CACB.

section 12.1.5: Master of Architecture (M.Arch.) Professional (Non-Thesis) (60 credits)

The M.Arch. (Professional); Non-Thesis degree program provides a structured opportunity to explore advanced architectural design, integrating building construction, landscape and urban design, professional practice, sustainable design, and the history and theory of architecture. A strategic focus on design methodology, innovative research, and self-directed inquiry, supported by the advanced media and modeling technologies and other resources required to carry out architectural research and creative practice.

Post-Professional Programs

The Post-professional master's programs are open to applicants who have a professional degree in architecture. Students holding the McGill B.Arch. (former) or M.Arch. (Professional) (current) degree, or an equivalent professional qualification, with a CGPA of at least 3.0 on a 4.0-point scale, are eligible for admission to the post-professional programs. In special cases, applicants with a degree in a related field may be considered.

The primary requirement for the M.Arch. (Post-professional) degree is coursework to be completed in the first two terms, and a research report (depending on the particularrst tw

section 12.1.7: Master of Architecture (M.Arch.) Post-professional (Non-Thesis) Urban Design and Housing (45 credits)

The UDH program enables students who have already completed a professional degree in Architecture to develop specialized skills for contemporary practice in housing, urban design, and the management of human settlements. The 12-month program comprises three consecutive terms of coursework. Intensive seminars held during the first two terms focus on contemporary theory and research methods in urban design and housing. Students take ARCH 603 (Urban Design and Housing Studio) as an applied synthesis of the material discussed in the two core seminars. Complementary coursework rounds out the fall and winter terms along with ARCH 623 (Project Preparation), in which students develop the strategy for a major independent project (ARCH 632, Urban Design and Housing Research Report) to be completed in the summer term.

section 12.1.8: Doctor of Philosophy (Ph.D.) Architecture

The McGill University Ph.D. in Architecture is a research degree with a thesis. The foundations for the doctoral thesis are developed through a series of courses taken in the first two years of study. Students and supervisors meet regularly in the first year to prepare the thesis proposal (ARCH 700). Three Literature Review preparatory courses (ARCH 721, ARCH 722, ARCH 723) and three (or more) complementary courses are taken. All students also participate in the two Research Seminars (ARCH 711, ARCH 712) to present the research framework and objectives for peer critique. By the end of the second year of studies (Ph.D. 3), Ph.D. students must complete the Comprehensive Examination (ARCH 701) with a formal presentation to their advisory committee.

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.

12.1.3 Architecture Admission Requirements and Application Procedures

12.1.3.1 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.

- A total of two (2) confidential letters of reference are required for your application: two (2) from academics **or** one (1) from an academic and one (1) from a recent employer. Once you have identified your referees (you must provide a valid institutional email address for each referee), McGill will send them an email asking for a reference in support of your application. Additionally, uploaded letters must be on university or company/business stationery and the referee must indicate their position and full contact information at the institution. Please refer to *mcgill.ca/gradapplicants/apply/prepare/checklist/documents*.
- Once accepted to the M.Arch. Professional program, students will benefit from faculty expertise within the School in the areas of History and Theory of Architecture; Cultural Landscape Studies; Affordable and Sustainable Housing; Computation and Fabrication; High-performance Visualization; Minimum Cost Housing; Gender, Sexuality, and Space; Design and Health; Urban Design; Landscape Urbanism; Architectural Representation; Urban Agriculture; Vernacular Architecture; Reurbanization.
- Completed *Program Comparison Chart**

  Note: Not required by B.Sc.(Arch.) graduates from McGill University.

- Course calendar descriptions of previous college and/or university studies must be submitted in addition to the Program Comparison Chart.

  Note: Not required by B.Sc.(Arch.) graduates from McGill University.

- A comprehensive e-portfolio (pdf format, max. 15 MB, due no later than December 15) that may include the following: selected work from all previous design studios; examples of project work from other courses; examples of freehand drawing and sketching; examples of professional work: sketches, dra

Associate Pr

ARCH 517	(3)	Sustainable Residential Development
ARCH 525	(3)	Seminar on Analysis and Theory
ARCH 528	(3)	History of Housing
ARCH 531	(3)	Architectural Intentions Vitruvius - Renaissance
ARCH 532	(3)	Origins of Modern Architecture
ARCH 535	(3)	History of Architecture in Canada
ARCH 536	(3)	Heritage Conservation
ARCH 540	(3)	Selected Topics in Architecture 1
ARCH 541	(3)	Selected Topics in Architecture 2
ARCH 542	(3)	Selected Topics in Architecture 3
ARCH 543	(3)	Selected Topics in Architecture 4
ARCH 602	(3)	Housing Seminar
ARCH 604	(3)	Urban Design Seminar
ARCH 627	(3)	Research Methods
ARCH 641	(3)	Energy and Environments 1
ARCH 642	(3)	Energy and Environments 2
ARCH 680	(2)	Field Sketching
ARCH 684	(4)	Contemporary Theory 1
ARCH 685	(4)	Contemporary Theory 2
ARCH 688	(3)	Directed Research 1
ARCH 689	(3)	Directed Research 2
OCC1 625	(3)	Functional Environments
URBP 555	(3)	Real Estate and Planning
URBP 651	(3)	Redesigning Suburban Space

12.1.6 Master of Architecture (M.Arch.) Post-professional (Non-Thesis): Architectural History & Theory (45 credits)

The history and theory program pursues intellectual inquiries in the history of architecture, focusing upon the discipline's continually changing theoretical framework. It aims to advance knowledge and foster ethical reflections in architecture through critical historical research into the philosophical, political, cultural, and technological contexts of the discipline. The one-year, three semester program is suited to recent graduates of professional architecture programs and experienced practitioners who wish to explore the complex connections among history, theory, and design; it also provides a thorough preparation for the subsequent pursuit of a PhD degree in the history and theory of architecture. It is structured around core seminars and lectures on topics that range from the history of architecture, the history of science and technology in design, the influence of cultural and gender studies on the discipline, and aesthetic philosophy. The curriculum culminates with an individual research project defined by the student in consultations with advisers.

The History and Theory option within the M.Arch. post-professional program enables students who have completed their professional M.Arch. degree (or some closely-related degree) to develop critical skills and knowledge vis-a-vis architecture as a broad cultural phenomenon. The twelve-month program comprises three consecutive semesters of coursework. Required seminars held during the first two terms involve intensive commitment to reading and writing. The Fall and Winter terms are rounded out with one elective course and Project Preparation (ARCH 623), in which students develop the strate

ARCH 651	(6)	Architectural History and Theory Seminar 1
ARCH 652	(4)	Architectural History and Theory Seminar 2
ARCH 653	(4)	Architectural History and Theory Seminar 3
ARCH 654	(6)	Architectural History and Theory Seminar 4

Elective Course (3 credits)

Any course at the 500- or 600- level, with the approval of the School.

12.1.7 Master of Architecture (M.Arch.) Post-professional (Non-Thesis) Urban Design and Housing (45 credits)

The Urban Design and Housing program enables students who have already completed their professional M.Arch. degree (or equivalent) to develop specialized skills for contemporary practice in housing, urban design, and the management of human settlements. The twelve-month program comprises three consecutive semesters of coursework. Intensive seminars held during the first two terms focus on contemporary theory and research methods in urban design and housing. Students take ARCH 603 Urban Design and Housing Studio as an applied synthesis of the material discussed in the two core seminars. Nine credits of complementary coursework round out the Fall and Winter terms along with ARCH 623 Project Preparation, in which students develop the strategy for a major independent project (ARCH 632 Urban Design and Housing Research Report) to be completed in the Summer term.

Research Report (15 credits)

ARCH 632	(15)	Urban Design and Housing Research Report

Required Courses (18 credits)

ARCH 551	(3)	Urban Design and Planning
ARCH 602	(3)	Housing Seminar
ARCH 603	(6)	Urban Design and Housing Studio
ARCH 623	(3)	Project Preparation
ARCH 627	(3)	Research Methods

Complementary Courses (12 credits)

12 credits of any courses at the 500 level or higher, approved by an adviser.

12.1.8 Doctor of Philosophy (Ph.D.) Architecture

The Ph.D. in Architecture is a research degree with a thesis, the foundations for which are developed through a series of courses taken in the first two years of study. Each student meets regularly with the supervisor in the first year to prepare the thesis proposal (ARCH 700). Three Literature Review preparatory courses (ARCH 721, ARCH 722, ARCH 723) and three (or more) complementary courses are taken in the first two years of study. All students also participate in the two Research Seminars (ARCH 711, ARCH 712) to present the research framework and objectives for peer critique. By the end of the second year of studies (Ph.D.-3), the student must complete the Comprehensive Examination (ARCH 701) with a formal presentation to an Advisory Committee.

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 (15 credits)

ARCH 700	(0)	Thesis Proposal
ARCH 701	(0)	Comprehensive Examination
ARCH 711	(3)	Doctoral Proseminar 1
ARCH 712	(3)	Doctoral Proseminar 2
ARCH 721	(3)	Literature Review 1
ARCH 722	(3)	Literature Review 2

ARCH 723	(3)	Literature Review 3

Complementary Courses (9 credits)

Students must take 9 credits of courses at the 600 or 700 level, selected with the approval of the School.

12.2 Bioengineering

12.2.1 Location

Department of Bioengineering
McConnell Engineering Building, Room 350
3480 University Street
Montreal QC H3A 0E9
Telephone: 514-398-7254
Email: *info.bioeng@mcgill.ca*
Website: *mcgill.ca/bioengineering*

12.2.2 About Bioengineering

The Department of Bioengineering, established in 2012, is the newest department to join McGill University's renowned Faculty of Engineering. McGill researchers from nearly all faculty units, including seven Canada Research Chairs and many colleagues in the Faculties of Medicine and Health Sciences, Science, and Agricultural and Environmental Sciences, are actively involved in various areas of bioengineering. Within our Department, faculty members conduct research in three major fields:

- Biological materials and mechanics
- Biomolecular and cellular engineering
- Biological Information and Computation

12.2.3 Graduate Studies

Graduate study in Bioengineering is available through the Biological and Biomedical Engineering (BBME) graduate programs, offered jointly by the Department of Bioengineering (Faculty of Engineering) and the Department of Biomedical Engineering (Faculty of Medicine and Health Sciences). 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 programs offer unsurpassed opportunities for multidisciplinary research with internationally-renowned scientists.

Please consult *: Biological and Biomedical Engineering* and the *Biological and Biomedical Engineering website* for further information on this program.

12.2.4 Bioengineering Faculty

Chair

Dan V. Nicolau

Professors

Dan V. Nicolau; B.Eng., M.Eng.(Bucharest Tech.), M.S.(ASE, Bucharest), Ph.D.(Bucharest Tech.)

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

Sebastian Wachsmann-Hogiu; B.S.(Bucharest), Ph.D.(HU Berlin)

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

Associate Professors

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

Adam Hendricks; B.S., M.S.(Virginia Tech), Ph.D.(Mich.)

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

- hydrogen storage and molecular modelling of hydrogen storage;
- hydrogen fuel cells and solid oxide fuel cells;
- methane recovery, storage, and transportation using gas hydrates;
- oil and gas flow assurance;
- plasma technology to produce nanomaterials for energy conversion/storage devices.

Environmental engineering – Environmental engineering is the application of science and engineering principles to protect the environment and remediate contaminated sites. Chemical and environmental engineers develop and design processes to provide healthy air, water, and soil. They also develop green

12.3.3 Chemical Engineering Admission Requirements and Application Procedures

12.3.3.1 Admission Requirements

Admission to graduate studies requires a minimum CGPA of 3.0/4.0 (or equivalent) for the complete bachelor's program, or a minimum GPA of 3.2/4.0 (or equivalent) in the last two years of full-time studies in an undergraduate program. 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 achieve a minimum *TOEFL* score of 90 on the Internet-based test (iBT), with each component score not less than 20, prior to admission.

M.Eng. (Thesis), M.Eng. (Non-Thesis)

Admission requires a bachelor's degree (or equivalent) in engineering or science disciplines.

Ph.D.

Admission requires a master's degree (or equivalent) from a recognized university. Students in the Department's M.Eng. (Thesis) program may petition to transfer to the Ph.D. program after one year without submitting the master's thesis following a formal "fast-track" procedure. At their request, applicants (without a master's degree) with exceptionally high Academic Standing and outstanding research potential will be considered for direct admission to the Ph.D. program.

12.3.3.2 Application Procedure

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

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

12.3.3.2.1 Additional Requirements

- Reference Letter – Ph.D. applicants must submit a letter of recommendation from their master's research supervisor.

12.3.3.3 Application Dates Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Chemical 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 *mcgill.ca/gps/contact/graduate-program*.

	Application Opening Dates	Application Deadlines		
	All Applicants	**Non-Canadian citizens (incl. Special, Visiting & Exchange)**	**Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)**	**Current McGill Students (any citizenship)**
Fall Term:	Sept. 15	Jan. 15	Jan. 15	Jan. 15
Winter Term:	Feb. 15	Aug. 1	Oct. 15	Oct. 15
Summer Term:	May 15	Jan. 15	Jan. 15	Jan. 15

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

Application Deadlines differ for International and Canadian (and Permanent Resident) students to allow time to obtain a visa.

12.3.4 Chemical Engineering Faculty

Chair

Viviane Yargeau

Emeritus Professors

David G. Cooper; B.Sc., Ph.D.(Tor.)

John M. Dealy; B.S.(Kansas), M.S.E., Ph.D.(Mich.), Eng.

Musa R. Kamal; B.S.(Ill.), M.S., Ph.D.(Carn. Mell), Eng.

Richard J. Munz; B.A.Sc.(Wat.), Ph.D.(McG.), Eng.

W.J. Murray Douglas; B.Sc.(Qu.), M.S.E., Ph.D.(Mich.)

Emeritus Professors

Juan H. Vera; Ing.Quim.(UTE, Chile), M.Sc.(Calif., Berk.), Dr.Ing.(USM, Chile)

Professor (Post-Retirement)

Jean-Luc Meunier; Dipl.Ing.(EPFL), M.Sc., Ph.D.(INRS, Queb.), ing

Professors

Sylvain Coulombe; B.Sc., M.Sc.A.(Sher.), Ph.D.(McG.), ing. (*Gerald Hatch Faculty Fellow*)

Richard L. Leask; B.A.Sc., M.A.Sc.(Wat.), Ph.D.(Tor.), P.Eng.

Milan Maric; B.Eng.Mgt.(McM.), Ph.D.(Minn.), P.Eng.

Sasha Omanovic; Dipl.Ing., Dr.Sc.(Zagreb), P.Eng.

Alejandro D. Rey; B.Ch.E.(CCNY), Ph.D.(Calif., Berk.), F.R.S.C. (*James McGill Professor*)

Phillip Servio; B.A.Sc., Ph.D.(Br. Col.)

Nathalie Tufenkji; B.Eng.(McG.), M.Sc., Ph.D.(Yale), ing. (*CRC-Tier I*)

Viviane Yargeau; B.Ch.E., M.Sc.A., Ph.D.(Sher.), ing.

Associate Professors

Dimitrios Berk; B.Sc.(Bosphorus), M.E.Sc.(UWO), Ph.D.(Calg.), P.Eng.

Corinne Hoesli; B.Sc., B.A.Sc.(Ott.), Ph.D.(Br. Col.), ing.

Jan Kopyscinski; Dipl.Ing.(BTU Cottbus), Dr.Sc.(ETH Zurich), P.Eng.

P.-Luc Girard-Lauriault; B.Sc.(Montr.), Ph.D.(École Poly., Montr.)

Reghan James Hill; B.E.(Auck.), Ph.D.(Cornell)

Anne-Marie Kietzig; Dipl.Ing.(TU Berlin), Ph.D.(Br. Col.), ing.

Assistant Professors

Noémie Dorval Courchesne; B.Sc., B.A.Sc.(Ott.), Ph.D.(MIT)

Samuel Huberman; B.A.Sc.(Wat.), Ph.D.(MIT)

Christopher Moraes; B.A.Sc., Ph.D.(Tor.), P.Eng.

Ali Seifitokaldani; B.Sc., M.Sc.(AUT, Iran), Ph.D.(Montr.)

12.3.5 Master of Science (M.Sc.) 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.

12.3.6 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 level.

12.3.7 Master of Engineering (M.Eng.) Chemical Engineering (Non-Thesis): Environmental Engineering (45 credits)

This program is currently not accepting applicants.

Research Project (6 credits)

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)

OCCH 612	(3)	Principles of Toxicology

OCCH 616	(3)	Occupational Hygiene

Water pollution engineering: (4 credits)

CIVE 651	(4)	Theory: Water / Wastewater Treatment
CIVE 652	(4)	Bioprocesses for Wastewater Resource Recovery
CIVE 660	(4)	Chemical and Physical Treatment of Waters

Air pollution engineering: (3 credits)

CHEE 592	(3)	Industrial Air Pollution Control
MECH 534	(3)	Air Pollution Engineering

Soil and water quality management: (3 credits)

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

Environmental impact: (3 credits)

GEOG 551	(3)	Environmental Decisions
GEOG 601	(3)	Advanced Environmental Systems Modelling

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

Environmental policy: (3 credits)

URBP 506	(3)	Environmental Policy and Planning

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

Elective Courses (11 credits)

CHEE 696	(6)	Extended Project

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

12.3.8 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

section 12.4.7: Master of Engineering (M.Eng.) Civil Engineering (Non-Thesis) (45 credits)

This is primarily a coursework degree with the possibility of a small independent research project.

section 12.4.8: Doctor of Philosophy (Ph.D.) Civil Engineering

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

12.4.3 Civil Engineering Admission Requirements and Application Procedures

12.4.3.1 Admission Requirements

The general rules of Graduate and Postdoctoral Studies apply and are detailed in *University Regulations & Resources* > *Graduate* > *: Graduate Admissions and Application Procedures*. The minimum academic standard for admission is a cumulative grade point average (CGPA) of 3.0/4.0 in a recognized program. Alternatively, an equivalent grade point average of no less than 3.2/4.0 over the last two years of the program will be accepted.

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 write either:

- the *TOEFL* (Test of English as a Foreign Language; Applicants must achieve an overall minimum score of 94 on the internet-based test (iBT) with a minimum score of 20 for each component (i.e., Writing, Reading, Speaking, Listening); **or**
- the *IELTS* (International English Language Testing System); Applicants must achieve a minimum band score of 7 in order to apply.

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 their country of residence. Full information and registration forms may be obtained by consulting the *TOEFL* or the *IELTS* websites.

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

The GRE is not required but is highly recommended.

12.4.3.2 Application Procedures

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

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

12.4.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Civil 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 *mcgill.ca/gps/contact/graduate-program*.

	Application Opening Dates	Application Deadlines		
	All Applicants	**Non-Canadian citizens (incl. Special, Visiting & Exchange)**	**Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)**	**Current McGill Students (any citizenship)**
Fall Term:	Sept. 15	Jan. 15	Jan. 15	Jan. 15
Winter Term:	Feb. 15	Aug. 1	Oct. 15	Oct. 15
Summer Term:	N/A	N/A	N/A	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.

12.4.4 Civil Engineering Faculty

Chair

Mohamed A. Meguid

Associate Chair

Jinxia Liu (Student Affairs)

Colin Rogers (Academic Programs)

Emeritus Professors

M. Saeed Mirza; M.S., B.Eng.(Karachi), M.Eng., Ph.D.(McG.), F.E.I.C., F.C.S.C.E., F.A.C.I., Hon. F.I.E.P., Eng.

Suresh C Shrivastava; B.Sc.(Eng.)(Vikram), M.C.E.(Delaware), Sc.D.(Col.). Eng.

Associate Professor (Post-Retirement)

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

Professors

Vincent H. Chu; B.Eng.(Taiwan), M.A.Sc.(Tor.), Ph.D.(MIT), Eng.

Luc E. Chouinard; B.Ing., M.Ing.(Montr.), B.C.L.(McG.), Sc.D.(MIT), Eng.

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

Ghyslaine McClure; B.Ing.(Montr.), S.M.(MIT), Ph.D.(Montr.), Eng.

Mohamed A. Meguid; B.Sc.(al-Azhar), M.Sc., Ph.D.(UWO), P.Eng.

Denis Mitchell; B.A.Sc., M.A.Sc., Ph.D.(Tor.), F.A.C.I., Eng. (*Distinguished James McGill Professor*)

Van-Thanh-Van Nguyen; B.M.E.(Nat. IT, Saigon), M.C.E.(AIT), D.A.Sc.(École Poly., Montr.), Eng.

James Nicell; B.A.Sc., M.A.Sc., Ph.D.(Windsor), P.Eng.; *Dean, Faculty of Engineering*

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

A. P

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)	Master's (Thesis) Research Seminar

Complementary Courses (17 credits)

17 credits at the 500 or 600 level, with at least 8 credits at the 600 level.

12.4.6 Master of Engineering (M.Eng.) Civil Engineering (Non-Thesis): Environmental Engineering (45 credits)

The program consists of a minimum of 45 credits, of which, depending on the student's home department, a minimum of 5 and a maximum of 15 may be allotted to the research project. The balance of 30 to 40 credits is earned by coursework. The Department also allows students to complete the program using a minimum of 45 credits of coursework only.

The Environmental Engineering option is administered by the Faculty of Engineering. Further information may be obtained from the Program Coordinator, Department of Civil Engineering.

Research Project

(0 or 5-15 credits)

The program may include a project or, with Departmental approval, may be completed with courses only.

Required Courses (6 credits)

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

Complementary Courses

(24-39 credits)

a minimum of 22 credits chosen from the following:

Data analysis:

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

Toxicology:

OCCH 612	(3)	Principles of Toxicology

Water pollution engineering:

CIVE 651	(4)	Theory: Water / Wastewater Treatment
CIVE 652	(4)	Bioprocesses for Wastewater Resource Recovery
CIVE 660	(4)	Chemical and Physical Treatment of Waters

Air pollution engineering:

(0 or 5-15

MECH 534	(3)	Air Pollution Engineering

Soil and water quality management:

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

Environmental impact:

GEOG 551	(3)	Environmental Decisions
GEOG 601	(3)	Advanced Environmental Systems Modelling

Environmental policy

URBP 506	(3)	Environmental Policy and Planning

Elective Courses

Also, 0-15 credits of graduate courses from an approved list of courses from the Faculties of Engineering, Agricultural and Environmental Sciences, Law, Management; Departments of Atmospheric and Oceanic Sciences, Biology, Chemistry, Earth and Planetary Sciences, Economics, Epidemiology and Biostatistics, Geography, Occupational Health, Political Science, School of Religious Studies, Sociology, and Bieler School of Environment.

12.4.7 Master of Engineering (M.Eng.) Civil Engineering (Non-Thesis) (45 credits)

The MEng Non-Thesis program aims to provide a more professional orientation to graduate students. The main features of this degree program are:

A minimum of 15 credits selected from a list of research oriented courses

A maximum of 30 credits with emphasis on expertise (specialty area) for professional practice.

Research Seminar (3 credits)

CIVE 664	(3)	MEng (Non-thesis) Research Seminar

List A: Research Courses

(12-42) credits

A minimum of 12 credits from research courses, from one of the research streams: 1) Infrastructure, 2) Environmental/Hydraulics-Water Resources, and 3) Transportation.

Infrastructure Stream

CIVE 512	(3)	Advanced Civil Engineering Materials
CIVE 602	(4)	Finite Element Analysis
CIVE 603	(4)	Structural Dynamics
CIVE 609	(4)	Risk Engineering
CIVE 623	(4)	Durability of Construction Materials

Environmental/Hydraulics-Water Resources

CIVE 555	(3)	Environmental Data Analysis
CIVE 572	(3)	Computational Hydraulics
CIVE 584	(3)	Mechanics of Groundwater Flow
CIVE 651	(4)	Theory: Water / Wastewater Treatment
CIVE 677	(4)	Water-Energy Sustainability

Transportation

CIVE 540	(3)	Urban Transportation Planning
CIVE 542	(3)	Transportation Network Analysis
CIVE 560	(3)	Transportation Safety and Design
CIVE 609	(4)	Risk Engineering

List B: Other Complementary Courses from the Department

0-30 credits

Courses from List A that are not used to fulfill the 15 credits requirement of Research Courses can be used also as complementary courses.

CIVE 520	(3)	Groundwater Hydrology
CIVE 521	(3)	Nanomaterials and the Aquatic Environment
CIVE 527	(3)	Renovation and Preservation: Infrastructure
CIVE 550	(3)	Water Resources Management
CIVE 551	(3)	Environmental Transport Processes
CIVE 557	(3)	Microbiology for Environmental Engineering
CIVE 558	(3)	Biomolecular Techniques for Environmental Engineering
CIVE 561	(3)	Greenhouse Gas Emissions
CIVE 573	(3)	Hydraulic Structures
CIVE 574	(3)	Fluid Mechanics of Water Pollution
CIVE 577	(3)	River Engineering
CIVE 604	(4)	Theory of Plates and Shells
CIVE 605	(4)	Stability of Structures
CIVE 607	(4)	Advanced Design in Steel
CIVE 612	(4)	Earthquake-Resistant Design
CIVE 614	(4)	Composites for Construction
CIVE 615	(3)	Environmental Engineering Seminar
CIVE 616	(4)	Nonlinear Structural Analysis for Buildings
CIVE 617	(4)	Bridge Engineering
CIVE 618	(4)	Design in Concrete 1
CIVE 622	(4)	Prestressed Concrete
CIVE 624	(4)	Durability of Structures
CIVE 625	(4)	Condition Assessment of Existing Structures
CIVE 628	(4)	Design of Wood Structures
CIVE 637	(4)	Discrete Choice Modeling in Transportation
CIVE 652	(4)	Bioprocesses for Wastewater Resource Recovery
CIVE 660	(4)	Chemical and Physical Treatment of Waters
CIVE 661	(4)	Modelling of Transportation Emissions
CIVE 663	(4)	Environmental Fate of Organic Chemicals
CIVE 683	(4)	Advanced Foundation Design
CIVE 686	(4)	Site Remediation

Project Courses

0 or 5-15 credits

Credits for a program may vary, depending on the amount of work involved. Project courses are chosen from the following:

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

Graduate courses from other McGill Engineering Departments are also allowed as complementary courses. A maximum of 1/3 of coursework credits can be taken outside McGill. Approval is required from the Department in both cases.

12.4.8 Doctor of Philosophy (Ph.D.) Civil 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

CIVE 701	(0)	Ph.D. Comprehensive Examination
CIVE 702	(0)	Ph.D. Research Proposal

Complementary Courses

6-8 credits at the 500 or 600 level taken from the Department of Civil Engineering.

12.5 Electrical and Computer Engineering

12.5.1 Location

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

12.5.2 About Electrical and Computer Engineering

The Department offers programs of graduate studies leading to a degree of **Master of Science** (thesis), **Master of Engineering** (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 350 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 *Centre for Intelligent Machines* (CIM) is an interdisciplinary research group focused on intelligent systems. Its laboratories include research in the domains of robotics, systems and control, computer vision, medical imaging, computer graphics, and machine learning.
- Telecommunications laboratories focus their work on signal processing, broadband communications, and networking; these laboratories form part of the *Centre for Systems, Technologies and Applications for Radiofrequency and Communications* (STARaCOM), 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.
- Solid state facilities include measurement equipment for magnetic and electric properties of materials, vacuum deposition, and RF sputtering systems.
- The *Computational Electromagnetics Laboratory* provides tools for numerical analysis, visualization, interface design, and knowledge-based system development.
- There is also a well-equipped laboratory for power electronics and power systems research.

The Department has extensive computer facilities. Most research machines are networked, providing access to a vast array of hardware. In addition, McGill University is linked to the *Centre de recherche informatique de Montréal* (CRIM) and the University Computing Centre.

There are three other universities in Montreal: Concordia University is the other English-language university; *l'Université de Montréal*, and its affiliated school of engineering, *l'École Polytechnique*, is the largest francophone university; *l'Université du Québec* has a campus in Montreal and in major towns throughout the province.

The proximity of these schools to McGill University ensures that a rich array of courses is available to suit individual needs. McGill also collaborates on research projects with many organizations such as *l'Institut de recherche d'Hydro-Québec* (IREQ) and *l'Institut national de la recherche scientifique* (INRS).

Financial Support

Graduate Assistantships: The Department awards several graduate assistantships to qualified full-time graduate students. These are normally funded from research grants or contracts awarded to individual faculty members. In return, the graduate assistant is expected to perform research-related tasks assigned 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 *mcgill.ca/gps/funding*, or contact:

Graduate and Postdoctoral Studies, McGill University
James Administration Building, Room 400
845 Sherbrooke Street West
Montreal QC H3A 0G4
Website: *mcgill.ca/gps/contact/gps*

section 12.5.5: Master of Science (M.Sc.) Electrical Engineering (Thesis) (45 credits)

** This program replaces the M.Eng. Electrical Engineering (Thesis) program as of January 2020 **

The Master of Science in Electrical Engineering (Thesis) is research-oriented and 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

section 12.5.5: Master of Science (M.Sc.) Electrical Engineering (Thesis) (45 credits)

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 12.5.6: 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 12.5.7: 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 de

	Application Opening Dates	Application Deadlines		
	All Applicants	**Non-Canadian citizens (incl. Special, Visiting & Exchange)**	**Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)**	**Current McGill Students (any citizenship)**
Fall Term:	Sept. 15	Dec. 15	Dec. 15	Dec. 15
Winter Term:	Feb. 15	Aug. 1	Oct. 15	Oct. 15
Summer Term:	N/A	N/A	N/A	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.

12.5.4 Electrical and Computer Engineering Faculty

Chair

Warren Gross

Associate Chair, Academic

Ioannis Psaromiligkos

Associate Chair, Undergraduate Programs

François Bouffard

Associate Chair, Graduate Programs

Odile Liboiron-Ladouceur

Associate Chair, Operations

Dennis Giannacopoulos

Emeritus Professors

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.

Peter Kabal; B.A.Sc., M.A.Sc., Ph.D.(Tor.)

Martin D. Levine; B.Eng., M.Eng.(McG.), Ph.D.(Lond.), F.C.I.A.R., F.I.E.E.E., Eng.

Boon-Teck Ooi; B.E.(Adel.), S.M.(MIT), Ph.D.(McG.), Eng.

Tomas J.F. Pavlasek; B.Eng., M.Eng., Ph.D.(McG.), Eng.

Nicholas C. Rumin; B.Eng., M.Sc., Ph.D.(McG.), Eng.

Jonathan P. Webb; B.A., Ph.D.(Camb.)

Professors

Tal Arbel; M.Eng., Ph.D.(McG.), P.Eng.

Benoit Boulet; B.Sc.(Laval), M.Eng.(McG.), Ph.D.(Tor.) P.Eng.

Peter E. Caines; B.A.(Oxf.), D.I.C., Ph.D.(Lond.), F.R.S.C., F.I.E.E.E., F.C.I.A.R. (*Distinguished James McGill Professor and William C. Macdonald Chair*) P.Eng. (*Currently on sabbatical*)

Benoit Champagne; B.Eng., M.Eng.(Montr.), Ph.D.(Tor.), P.Eng.

Lawrence Chen; B.Eng.(McG.), M.A.Sc., Ph.D.(Tor.), ing. (*Currently on sabbatical*)

James Clark; B.Sc., Ph.D.(Br. Col.), P.Eng.

Mark Coates; B.Eng.(Adel.), Ph.D.(Camb.), P.Eng.

Jeremy R. Cooperstock; A.Sc.(Br. Col.), M.Sc., Ph.D.(Tor.), ing.Jr.

Professors

Frank Ferrie; B.Eng., Ph.D.(McG.), P.Eng.

Warren Gross; B.A.Sc.(Wat.), M.A.Sc., Ph.D.(Tor.) (*James McGill Professor*) P.Eng.

Geza Joos; B.Sc.(C'dia), M.Eng., Ph.D.(McG.) (*CRC Chair*) P.Eng (*Industrial Chair*). (*Currently on sabbatical*)

Andrew G. Kirk; B.Sc.(Brist.), Ph.D.(Lond.) P.Eng.

Fabrice Labeau; M.S., Ph.D.(Louvain) (*Deputy Provost, Student Life and Learning (SLL)*) P.Eng. (*Industrial Chair*)

Harry Leib; B.Sc.(Technion), Ph.D.(Tor.)

Tho Le-Ngoc; M.Eng.(McG.), Ph.D.(Ott.), F.I.E.E.E. (*CRC Chair*) P. Eng.

David A. Lowther; B.Sc.(Lond.), Ph.D.(C.N.A.A.), F.C.A.E., P.Eng. (*Currently on sabbatical*)

David V. Plant; M.S., Ph.D.(Brown), F.I.E.E.E., F.O.S.A., F.E.I.C., F.C.A.E. (*CRC Chair*) P.Eng.

Gordon Roberts; B.A.Sc.(Wat.), M.A.Sc., Ph.D.(Tor.), F.I.E.E.E., Eng. (*James McGill Professor*) P.Eng.

Martin Rochette; B.A., M.Eng., Ph.D.(Laval), P.Eng.

Thomas Szkopek; B.A.Sc., M.A.Sc.(Tor.), Ph.D.(Calif.-LA), P.Eng.

Dániel Varró; M.Sc., Ph.D.(BME)

Zeljko Zilic; B.Eng.(Zagreb), M.Sc., Ph.D.(Tor.), P.Eng.

Associate Professors

François Bouffard; B.Eng., Ph.D.(McG.) (*William Dawson Scholar*) P.Eng.

Christophe Dubach; M.Sc.(EPFL), Ph.D.(Edin.) (*Combined appointment with School of Computer Science*)

Mourad El-Gamal; B.Sc.(Cairo), M.Sc.(Nashville), Ph.D.(McG.)

Dennis Giannacopoulos; M.Eng., Ph.D.(McG.)

Roni Khazaka; M.Eng., Ph.D.(Car.) *(Associate Dean (Academic Programs))*

Odile Liboiron-Ladouceur; B.Eng.(McG.), M.Sc., Ph.D.(Col.) (*CRC Tier 2*) P.Eng.

Aditya Mahajan; B.Tech.(Indian IT), M.S., Ph.D.(Mich.), P.Eng.

Muthucumaru Maheswaran; B.Sc.(Peradeniya), M.S.E.E., Ph.D.(Purd.) (*joint appt. with School of Computer Science*)

Brett Meyer; B.S.(Wisc. Madison), M.S., Ph.D.(Carn. Mell), P.Eng.

Hannah Michalska; B.Sc., M.Sc.(Warsaw), Ph.D.(Lond.) P.Eng.

Gunter Mussbacher; Ph.D.(Ott.) (*William Dawson Scholar*) P.Eng.

Derek Nowrouzezahrai; B.Sc.(Wat.), M.Sc., Ph.D.(Tor.) (*Endowed Chair*) (*Director of CIM*)

Milica Popovich; B.Sc.(Colo.), M.Sc., Ph.D.(N'western), LL *(Associate Dean (Research & Innovation))*

Ioannis Psaromiligkos; B.Sc.(Patras), M.Sc., Ph.D.(SUNY, Buffalo), P.Eng.

Assistant Professors

Narges Armanfard; B.Sc.(Shahid), M.Sc.(Tarbiat Mod), Ph.D.(McM.)

Sharmistha Bhadra; B.Sc.(New Br.), M.Sc., Ph.D.(Manit.) (*EIT*)

Amin Emad; B.Sc.(Sharif), M.Sc.(Alta.), Ph.D.(Ill.) (*EIT*)

Hsiu-Chin Lin; M.Sc.(UAlberta) Ph.D.(Edin.) (*Combined appointment with School of Computer Science*)

AJung Moon; B.A.Sc.(Wat.), M.A.Sc., Ph.D.(Br.Col.)

Boris Vaisband; B.S.(Technion), M.S., Ph.D.(Roch.)

Xiaozhe Wang; B.Sc.(Zhejiang), M.Sc., Ph.D.(Cornell), P.Eng

Songrui Zhao; B.Sc.(Chu Ke-Chen), Ph.D.(Zhejiang), Ph.D.(McG)

Faculty Lecturer

Marwan Kanaan; B.Sc. (Beirut), M.A.Sc. (Windsor), Ph.D.(*expected 2021*, McGill), P.Eng.

Associate Members

Maxime Cohen; B.S., M.S.(Technion), Ph.D.(MIT)

Matthew Adam Dobbs; B.Sc.(McG.), Ph.D.(Vic., BC)

Gregory L. Dudek; B.Sc.(Qu.) M.Sc., Ph.D.(Tor.)

Alan C. Evans; Ph.D.(Leeds)

William R. Funnell; M.Eng., Ph.D.(McG.)

David Juncker; Ph.D.(Neuchâtel)

Samira A. Rahimi; B.Eng.(Tabriz) Ph.D. (Laval)

Adjunct Professors

Rhys Allan Adams, Donald Davis, Tiago H. Falk, Vincent Hayward, Mehrsan Javan-Roshtkhari, Innocent Kamwa, Marthe Kassouf, Morgan McGuire, Shane McIntosh, Zetian Mi, Frédéric Nabki, Douglas O'Shaughnessy, Michael Rabbat, Joseph J. Schlesinger, Joshua David Schwartz, Kenneth D. W

ECSE 654	(4)	M.Eng. Project 4
ECSE 655	(4)	M.Eng. Project 5
ECSE 656	(4)	M.Eng. Project 6

Students who choose the non-thesis option must register for the project courses during the three required terms of residency.

Complementary Courses (27 credits)

27 credits of 500-, 600-, or 700-level courses, of which no more than 9 credits may be outside the Department.

* Non-departmental courses require Departmental approval. Students may be allowed to take more than 9 credits of non-Departmental courses; a letter of recommendation from their supervisor outlining the reason for such an action is required.

12.5.7 Doctor of Philosophy (Ph.D.) Electrical 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

ECSE 701	(0)	Ph.D. Qualifying Examination
ECSE 702	(0)	Ph.D. Research Plan Proposal
ECSE 703	(0)	Doctoral Research Seminar

In addition to the successful completion of the required courses above, students must complete the courses prescribed by the student's Supervisory Committee.

12.6 Mechanical Engineering

12.6.1 Location

Department of Mechanical Engineering
Macdonald Engineering Building
817 Sherbrooke Street West, Room MD-270
Montreal QC H3A 0C3
Canada
Telephone: 514-398-8869 or 514-398-6281
Fax: 514-398-7365

- Design and manufacturing
- Dynamics and control
- Materials and structures
- Vibrations, acoustics, and fluid-structure

Within these areas, specific topics of research are given in the following:

Aerodynamics and fluid mechanics

Experimental fluid mechanics and aerodynamics, aeroelasticity, and aeroacoustics; theoretical fluid mechanics; turbulence; mixing in turbulent flows; fluid flow control; fluid-structure interactions; computational fluid dynamics, multidisciplinary optimization, and computer flow visualization; heat transfer; combustion, shock wave physics, energetic materials, high-speed reacting flows, hypersonic propulsion, and alternative fuels.

Bioengineering

Biomechanics, biomaterials, blood and respiratory flows, mechanics of soft tissues, cardiovascular devices, image processing for medical diagnostics, voice production.

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section 12.6.6: Master of Engineering (M.Eng.) Aerospace Engineering (Non-Thesis) (45 credits)

The M.Eng. (Aerospace) program requires both coursework and an “Industrial Stage” (i.e., engineering work in an aerospace industry) of four months. Enrolment is limited to the number of industrial stages available, so admission to the program is typically quite competitive. While intended to be a full-time program, the M.Eng. Aerospace program may be completed on a part-time basis over a maximum of five years. By the time of completion of the program, graduates are extremely well-prepared to enter into a career in the aerospace industry.

Depending on their background, students w

12.6.3.2.1 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

12.6.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Mechanical 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 *mcgill.ca/gps/contact/graduate-program*.

Professors

Marco Amabili; M.Sc.(MPU), Ph.D.(Bologna), F.A.S.M.E., F.C.A.E. (*Canada Research Chair*)

Bantwal R. Baliga; B.Tech.(IIT Kanpur), M.Sc.(Case West.), Ph.D.(Minn.)

Course Lecturers

Farhang Daneshmand

Richard Klopp

Master of Engineering (M.Eng.) Mec

Thesis Courses (28 credits)

MECH 691*	(3)	M.Sc. Thesis Literature Review
MECH 692	(4)	M.Sc.Thesis Research Proposal
MECH 693	(3)	M.Sc.Thesis Progress Report 1
MECH 694	(6)	M.Sc. Thesis Progress Report 2
MECH 695	(12)	M.Sc. Thesis

* Note: MECH 691 must be completed in the first term of the student's program.

Required Course

1 credit:

MECH 609	(1)	Seminar

Complementary Courses (16 credits)

A minimum of 16 credits (500, 600, or 700 level) from the Faculty of Engineering or Faculty of Science, at least 8 of which must be from within the Faculty of Engineering. FACC courses will not count toward the complementary course credits.

12.6.9 Doctor of Philosophy (Ph.D.) Mechanical Engineering

Candidates normally register for the M.Eng. degree in the first instance. However, in exceptional cases where the research work is proceeding very satisfactorily, or where the equivalent of the M.Eng. degree has been completed at another university, candidates may be permitted to proceed directly to the Ph.D. degree without submitting a master's thesis as long as they have satisfied the course requirements for the M.Eng. degree.

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

MECH 700	(0)	Ph.D. Literature Review
MECH 701	(0)	Ph.D. Thesis Proposal
MECH 702**MECHLocn**	(0)	Ph.D. Comprehensive Preliminary Oral Examination

Fax: 514-398-4492

12.7.2 About Mining and Materials Engineering

Mining Engineering

- Geomechanics
- Mining Environments
- Strategic Mine Planning and Optimization
- Stochastic Modelling
- Operations Research
- Rock Mechanics
- Mine Safety
- Mine Ventilation
- Renewable Energy
- Mineral Economics
- Materials Handling
- Environmental Engineering

Materials Engineering

- Process Metallurgy
- Computational Thermodynamics
- Effluent and Waste Treatment
- Mineral Processing
- Metal Casting and CFD Modelling
- Surface Engineering and Coatings
- Additive Manufacturing and Powder Metallurgy
- Ceramics
- Electron Microscopy
- Automotive and Aerosv Mw(7.fn90.41(•)Tj/F1 8.1 Tf1 0 0 1 81.693 369.721 n.oand Po)Tj Tf1 0 0 1 81au 0 1.1 Tf1 0 0 17cF7–g.(acturing Tm(v)TNan1 0 0 1 8ti)T

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 12.7.8

12.7.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines 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 *mcgill.ca/gps/contact/graduate-program*.

Application Opening Dates	Application Deadlines	
	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	**Current McGill Students (any citizenship)**

Associate Professors

Kirk Bevan; B.Eng.(UWO), Ph.D.(Purd.), P.Eng.

Mathieu Brochu; B.Eng.(Lav

Co-op Program Liaison Officers

Lisa Thiess (*Mining*)

12.7.5 Master of Engineering (M.Eng.) Mining Engineering (Thesis) (45 credits)

** This program is no longer offered **

The M.Eng. in Mining Engineering (Thesis) is a research-oriented degree that focuses on skills and knowledge of mining engineering through coursework and a research thesis under the supervision of a Faculty member (professor). Specific emphasis is placed on research methods as well as fundamentals; as such, the program is the more suitable option for those whose primary interest is research. Graduates of this degree either pursue a Ph.D. or work in industry. The M.Eng. (Thesis) degree is open to graduates holding the B.Eng. degree or its equivalent in Mining Engineering or other related engineering fields.

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 Course (6 credits)

MIME 601	(0)	Engineering Laboratory Practice

6 credits from the following:

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.

12.7.6 Master of Science (M.Sc.) Materials Engineering (Thesis) (45 credits)

The M.Sc. in Materials Engineering (Thesis) is a research-oriented program that focuses on research skills and knowledge of materials engineering through coursework and a research thesis under the supervision of a Faculty member (professor). Emphasis is placed on research methods, as well as fundamentals. As such, the program is the more suitable option for those whose primary interest is research. The M.Sc. (Thesis) is for candidates with a Bachelor's degree in Engineering or from a discipline relevant to materials engineering.

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 Courses (9 credits)

MIME 601	(0)	Engineering Laboratory Practice
MIME 610D1	(1.5)	Master's Foundation Course
MIME 610D2	(1.5)	Master's Foundation Course
MIME 670	(6)	Research Seminar 1

Complementary Courses (9 credits)

9 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.**Researcd2**

MIME 670	(6)	Research Seminar 1

Complementary Courses (24 credits)

12 credits of MIME courses at the 500 level or higher.

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

12.7.9 Master of Engineering (M.Eng.) Materials Engineering (Non-Thesis): Environmental Engineering (45 credits)

This interdepartmental graduate option leads to a Master of Engineering (M.Eng.) Materials Engineering: Non-Thesis-Environmental Engineering. The objective of the option is to train environmental professionals at an advanced level. The program is designed for individuals with an undergraduate degree in engineering. The Environmental Engineering option 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.

Research Project (6 credits)

MIME 680	(6)	Materials Engineering Project 1

Required Courses (6 credits)

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

Complementary Courses (22 credits)

(minimum 22 credits)

Data Analysis Course

One of the following courses:

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

Toxicology Course

One of the following courses:

OCCH 612	(3)	Principles of Toxicology
OCCH 616	(3)	Occupational Hygiene

Water Pollution Engineering Course

One of the following courses:

CIVE 651	(4)	Theory: Water / Wastewater Treatment
CIVE 652	(4)	Bioprocesses for Wastewater Resource Recovery
CIVE 660	(4)	Chemical and Physical Treatment of Waters

Air Pollution Engineering Course

One of the following courses:

CHEE 592	(3)	Industrial Air Pollution Control
MECH 534	(3)	Air Pollution Engineering

Soil and Water Quality Management Course

One of the following courses:

	(3)agement	Water Quality Management

MIME 628	(6)	Mineral Engineering Project 1

Required Courses (6 credits)

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

Complementary Courses (22 credits)

(minimum 22 credits)

Data Analysis Course

3 credits from the following:

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

Toxicology Course

3 credits from the following:

OCCH 612	(3)	Principles of Toxicology

The Master of Urban Planning (M.U.P.) program is a two-year course of study that attracts students from Quebec, Canada, the U.S., and overseas. It is recognized by the *Ordre des urbanistes du Québec* (OUQ) and the *Canadian Institute of Planners* (CIP). Graduates may become full members of the OUQ and other provincial planning associations by completing their respective internship and examination requirements.

The M.U.P. program was designed with a strong emphasis on project-based learning, in particular through practical work done in teams in three planning studios. Approximately half of the curriculum is dev

- Proof of competency in oral and written English for applicants whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognised foreign institution where English is the language of instruction or from a recognised Canadian institution (anglophone or francophone). By the application deadline for the program, appropriate exam results must be sent electronically directly from the *TOEFL* (Test of English as a Foreign Language) or *IELTS* (International English Language Testing Systems) Office (Note: McGill's Institutional Code is 0935). The minimum requirement for the T

Associate Professors

Madhav G. Badami; B.Tech., M.S.(IIT Madras) M.E.Des.(Calg.), Ph.D.(Br. Col.) (*joint appt. with Bieler School of Environment*)

Lisa Bornstein; B.Sc.(Calif., Berk.), M.R.P.(Cornell), Ph.D.(Calif., Berk.)

Nik Luka; B.A.A.(Ryerson), M.Arch.(Laval), Ph.D.(Tor.) (*joint appt. with Peter Guo-hua Fu School of Architecture*)

David Wachsmuth; B.A.(McG.), M.Sc.(Tor.), Ph.D.(NYU)

Assistant Professor

Anna Kramer; B.Env.D.(Dal.), M.Arch.(Dal.), Ph.D.(Wat.)

Adjunct Professors

Suzanne Doucet; B.A.(Ott.), B.E.D.S. (Dal.), M.Arch.(Dal.),M.Sc.Arch.(Laval)

Jayne Engle; B.Sc.(Eastern U., Penn.), M.B.A.(Temple), M.U.R.P.(Pitt.), Ph.D.(McG.)

Gorka Espiau; B.S.S., Ph.D.(Basque Country)

Nilson Espino; B.Arch.(USMA, Panama), M.Sc.(Ariz.), Ph.D.(Rice)

Murtaza Haider; B.Sc.(UET Peshawar), M.A.Sc., Ph.D.(Tor.)

Marc-André LeChasseur; LL.B.(Sher.), LL.M.(Montr.)

Mario Polèse; B.A.(CUNY), M.A., Ph.D.(Penn.)

Ray Tomalty; B.A., M.P.A.(Qu.), Ph.D.(Wat.)

Associate Members

Cameron Charlebois; B.Sc.(Arch.), B.Arch., M.B.A.(McG.)

Kevin Manaugh;B.A.(Naropa), M.U.P., Ph.D.(McG.)

Sarah Moser; B.A.(Vic., BC), M.L.A.(Tor.), Ph.D.(NUS)

Instructors

Mark Elsworthy, Daniel Goodfellow, Martin Wexler

12.8.5 Master of Urban Planning (M.U.P.) Urban Planning (Non-Thesis) (60 credits)

The M.U.P. requires two years of study and research including a three-month summer internship in a professional setting. Upon completion of the program, graduates are expected to have acquired basic planning skills, a broad understanding of urban issues, and specialized knowledge in a field of their own choice.

** Students interested in the Barbados Field Study semester option should contact the department on its availability **

Required Courses (42 credits)

URBP 609	(1)	Planning Graphics 1
URBP 610	(1)	Planning Graphics 2
URBP 611	(1)	Planning Graphics 3
URBP 612	(3)	History and Theory of Planning
URBP 622	(6)	Planning Studio 1
URBP 623	(6)	Planning Studio 2
URBP 624	(6)	Planning Studio 3
URBP 628	(0)	Practical Experience
URBP 630	(3)	Supervised Research Project 1
URBP 631	(3)	Supervised Research Project 2
URBP 632	(6)	Supervised Research Project 3
URBP 635	(3)	Planning Law
URBP 640	(1)	Introduction to Planning Statistics

URBP 641	(1)	Reading the Urban Landscape
URBP 642	(1)	Introduction to Planning Data

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

1-3 credits from the following:

URBP 505	(3)	Geographic Information Systems
URBP 643	(1)	Introduction to Geographic Information Systems

Group B

9-17 credits from the following:

ARCH 515	(3)	Sustainable Design
CIVE 540	(3)	Urban Transportation Planning
CIVE 561	(3)	Greenhouse Gas Emissions
GEOG 504	(3)	Advanced Economic Geography
GEOG 525	(3)	Asian Cities in the 21st Century
URBP 501	(2)	Principles and Practice 1
URBP 503	(3)	Public Transport: Planning and Operations
URBP 504	(3)	Planning for Active Transportation
URBP 506	(3)	Environmental Policy and Planning
URBP 514	(4)	Community Design Workshop
URBP 530	(3)	Urban Infrastructure and Services in International Context
URBP 536	(2)	Current Issues in Transportation 1
URBP 537	(2)	Current Issues in Transportation 2
URBP 541	(1)	Selected Topics in Planning
URBP 542	(1)	Selected Topics in Visual Analysis
URBP 543	(3)	Special Topics
URBP 553	(3)	Urban Governance
URBP 555	(3)	Real Estate and Planning
URBP 556	(3)	Urban Economy: A Spatial Perspective
URBP 557	(3)	Rethinking Zoning
URBP 604	(3)	Urban Design Seminar
URBP 607	(3)	Reading Course: Urban Planning
URBP 608	(3)	Advanced GIS Applications
URBP 616	(3)	Selected Topics 1
URBP 617	(3)	Selected Topics 2
URBP 618	(3)	Selected Topics 3
URBP 619	(4)	Land Use and Transport Planning
URBP 620	(4)	Transport Economics
URBP 625	(2)	Principles and Practice 2
URBP 626	(2)	Principles and Practice 3

URBP 629	(3)	Planning Theory and Practice in a Globalizing World
URBP 644	(1)	Multivariate Statistics
URBP 645	(1)	Social Research Methods 1
URBP 646	(1)	Social Research Methods 2
URBP 647	(1)	Selected Methods in Planning 1
URBP 648	(1)	Selected Methods in Planning 2
URBP 649	(1)	Visual and Spatial Methods
URBP 651	(3)	Redesigning Suburban Space
URBP 656	(3)	Urban Innovation and Creativity

Group C

0-8 credits from the following:

Students may take up to 9 credits of coursework offered at the 500 or 600 levels by any academic unit at McGill or at another Montreal university, with the approval of the School, if they help students to develop an in-depth knowledge of one or more subject areas in the field of planning, with the approval of the School. Choices usually include courses in real-estate analysis, urban geography, sociology, anthropology, law, politics, and environmental science. Students must confirm prior to registration that the selected course(s) can be counted toward the M.U.P. degree.

12.8.6 Master of Urban Planning (M.U.P.) Urban Planning (Non-Thesis): Transportation Planning (60 credits)

The Master of Urban Planning (M.U.P.) Urban Planning (Non-Thesis); Transportation Planning option enables students to specialize in this field as part of their course of study for the Master of Urban Planning degree (M.U.P.). Studio courses, an internship, and a final project involve real-life applications and research.

Required Courses (49 credits)

URBP 505	(3)	Geographic Information Systems
URBP 609	(1)	Planning Graphics 1
URBP 610	(1)	Planning Graphics 2
URBP 611	(1)	Planning Graphics 3
URBP 612	(3)	History and Theory of Planning
URBP 619	(4)	Land Use and Transport Planning
URBP 622	(6)	Planning Studio 1
URBP 623	(6)	Planning Studio 2
URBP 624	(6)	Planning Studio 3
URBP 628	(0)	Practical Experience
URBP 630	(3)	Supervised Research Project 1
URBP 631	(3)	Supervised Research Project 2
URBP 632	(6)	Supervised Research Project 3
URBP 635	(3)	Planning Law
URBP 640	(1)	Introduction to Planning Statistics
URBP 641	(1)	Reading the Urban Landscape
URBP 642	(1)	Introduction to Planning Data

Complementary Courses (11 credits)

Group A

5-11 credits from the following:

CIVE 540	(3)	Urban Transportation Planning

CIVE 561	(3)	Greenhouse Gas Emissions
CIVE 637	(4)	Discrete Choice Modeling in Transportation
CIVE 661	(4)	Modelling of Transportation Emissions
URBP 503	(3)	Public Transport: Planning and Operations
URBP 504	(3)	Planning for Active Transportation
URBP 506	(3)	Environmental Policy and Planning
URBP 536	(2)	Current Issues in Transportation 1
URBP 537	(2)	Current Issues in Transportation 2
URBP 608	(3)	Advanced GIS Applications
URBP 620	(4)	Transport Economics

Group B

0-6 credits

Students may take up to 6 credits of coursework at the 500 or 600-level offered by any academic unit at McGill or another Montreal university, with the approval of the School, if they help students to develop an in-depth knowledge of one or more subject areas in the field of planning. Choices usually include courses in real-estate analysis, urban geography, sociology, anthropology, law, politics, and environmental science. Students must confirm prior to registration that the selected course(s) can be counted toward the M.U.P

Group A (1 to 3 credits)

1-3 credits from the following:

URBP 505	(3)	Geographic Information Systems
URBP 643	(1)	Introduction to Geographic Information Systems

Group B (9 to 14 credits)

(9-14 credits)

At least 9 credits (three courses) from the following:

URBP 555	(3)	Real Estate and Planning
URBP 557	(3)	Rethinking Zoning
URBP 604	(3)	Urban Design Seminar
URBP 620	(4)	Transport Economics
URBP 629	(3)	Planning Theory and Practice in a Globalizing World
URBP 651	(3)	Redesigning Suburban Space
URBP 656	(3)	Urban Innovation and Creativity

Group C (0-5 credits)

0-5 credits from the following or other 500 or 600 level courses (see note below):

ARCH 515	(3)	Sustainable Design
GEOG 525	(3)	Asian Cities in the 21st Century
URBP 501	(2)	Principles and Practice 1
URBP 503	(3)	Public Transport: Planning and Operations
URBP 504	(3)	Planning for Active Transportation
URBP 506	(3)	Environmental Policy and Planning
URBP 514	(4)	Community Design Workshop
URBP 530	(3)	Urban Infrastructure and Services in International Context
URBP 541	(1)	Selected Topics in Planning
URBP 542	(1)	Selected Topics in Visual Analysis
URBP 543	(3)	Special Topics
URBP 556	(3)	Urban Economy: A Spatial Perspective
URBP 607	(3)	Reading Course: Urban Planning
URBP 616	(3)	Selected Topics 1
URBP 617	(3)	Selected Topics 2
URBP 618	(3)	Selected Topics 3
URBP 619	(4)	Land Use and Transport Planning
URBP 625	(2)	Principles and Practice 2
URBP 626	(2)	Principles and Practice 3
URBP 644	(1)	Multivariate Statistics
URBP 645	(1)	Social Research Methods 1
URBP 646	(1)	Social Research Methods 2
URBP 647	(1)	Selected Methods in Planning 1
URBP 648	(1)	Selected Methods in Planning 2

URBP 649	(1)	Visual and Spatial Methods

Students may also take courses at the 500 or 600 level in any academic unit at McGill or at another Montreal university, subject to the approval of the School.

12.8.8 Doctor of Philosophy (Ph.D.) Urban Planning, Policy and Design

The Doctor of Philosophy in Urban Planning, Policy and Design aims to prepare students for interdisciplinary research and teaching on the management of urban development as well as for leadership in the design and evaluation of urban policies and plans for cities in North America and the world. The program will focus on five identified areas of urban planning (land use planning and urban design; environmental planning; transportation planning; international development planning; real estate and economic development). Students are expected to spend the first two years of study taking courses, preparing for their comprehensive examination and writing their dissertation proposal. The remaining two (or more) years are spent conducting research and writing a thesis.

Required Courses (9 credits)

Every student must take courses worth at least 18 credits. Only one reading course can be included in this minimum requirement. The Advisory Committee may raise the requirement up to 24 credits (up to 36 credits for students entering as Ph.D. 1) in order to meet the specific needs of the student. With approval of their committee, students may elect to take a larger number of courses than is required, but in no case will the number of credits exceed thirty unless the student enters the program in Ph.D.1.

URBP 612	(3)	History and Theory of Planning
URBP 701	(0)	Doctoral Comprehensive Examination
URBP 703	(3)	Doctoral Research Seminar 1
URBP 704	(3)	Doctoral Research Seminar 2
URBP 709	(0)	Doctoral Research Proposal

Complementary Courses (6 credits)

3 credits in advanced research methods at the 600 level or higher. It may be taken in any academic unit at McGill or another university, subject to the approval of the Graduate Program or School Director.

3 credits in advanced theory at the 600 level or higher. It may be taken at McGill or at another university and must be approved by the Graduate Program or School Director1 0 0 1 70.52 504.202 Tm(URBPleS0 39)