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

Programs, Courses and University Regulations

2024-2025

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

1 . McGill University reserves the right to make changes to the information contained in this online publication - including correcting errors, altering fees, schedules of admission, and credit requirements, and revising or cancelling particular courses or programs - without prior notice.
2 . In the interpretation of academic regulations, the Senate is the final authority.
3 . Students are responsible for informing themselves of the University's procedures, policies and regulations, and the specific requirements associated with the degree, diploma, or certificate sought.
4 . All students registered at McGill University are considered to have agreed to act in accordance with the University procedures, policies and regulations.
5 . Although advice is readily available on request, the responsibility of selecting the appropriate courses for graduation must ultimately rest with the student.
6 . Not all courses are offered every year and changes can be made after publication. Always check the Minerva Class Schedule link at https://horizon.mcgill.ca/pban1/bwckschd.p_disp_dyn_sched for the most up-to-date information on whether a course is offered.
7 . The academic publication year begins at the start of the Fall semester and extends through to the end of the Winter semester of any given year. Students who begin study at any point within this period are governed by the regulations in the publication which came into effect at the start of the Fall semester.
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Note: Throughout this publication, "you" refers to students newly admitted, readmitted or returning to McGill.

Publication Information

Published by

Enrolment Services
McGill University
3415 McTavish Street
Montreal, Quebec, H3A 0C8
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1 Graduate and Postdoctoral Studies

1.1 Administrative Officers

Administrative Officers	
Josephine Nalbantoglu; B.Sc., Ph.D.(McG.)	**Associate Provost (Graduate Education) and Dean (Graduate and Postdoctoral Studies)**
Lorraine Chalifour; B.Sc., Ph.D. (Manit.)	**Associate Dean (Graduate and Postdoctoral Studies)**
Nathan Hall; B.A., M.A., Ph.D. (Manit.)	**Associate Dean (Graduate and Postdoctoral Studies)**
Russell Steele; B.S., M.S. (Carn. Mell), Ph.D. (Wash.)	**Associate Dean (Graduate and Postdoctoral Studies)**

1.2 Location

James Administration Building, Room 400
845 Sherbrooke Street West
Montreal QC H3A 0G4
Website: *mcgill.ca/gps*

Note: For inquiries regarding specific graduate programs, please contact the appropriate department.

1.3 Graduate and Postdoctoral Studies' Mission

The mission of Graduate and Postdoctoral Studies (GPS) is to promote university-wide academic excellence for graduate and postdoctoral education at McGill. GPS provides leadership and strategic direction across the university in close collaboration with the academic and administrative units, and the graduate and postdoctoral community.

2 Important Dates

For all dates relating to the academic year, consult *mcgill.ca/importantdates*.

3 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.

4 Program Requirements

Refer to *University Regulations & Resources* > *Graduate* > *Regulations* > *: Program Requirements* for graduate program requirements for the following:

- Master's Degrees
- Doctoral Degrees

- Coursework for Graduate Programs, Diplomas, and Certificates

5 Graduate Admissions and Application Procedures

Please refer to *University Regulations & Resources* > *Graduate* > *: Graduate Admissions and Application Procedures* for information on:

- Application for admission;
- Admission requirements;
- Application procedures;
- Competency in English; and
- Other information regarding admissions and application procedures for Graduate and Postdoctoral Studies.

6 Fellowships, Awards, and Assistantships

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

7 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 postdoctoral scholars will require during their studies at McGill and should be periodically consulted, along with other sections and related publications.

7.1 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 them 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.).

7.2 Guidelines and Policy for Academic Units on Postdoctoral Education

Every unit hosting postdocs should apply institutional policies and procedures for the provision of postdoctoral education and have established means for informing postdocs of policies, procedures, and privileges (available at *mcgill.ca/gps/postdocs*), as well as mechanisms for addressing complaints. For their part, postdocs are responsible for informing themselves of such policies, procedures, and privileges.

1. **Definition and Status**

   i. Postdoctoral status will be recognized by the University in accordance with Quebec provincial regulations as may be modified from time to time. The eligibility period for postdoctoral status is up to five years from the date when the Ph.D. or equivalent degree was awarded. A *: leave of absence* for parental or health reasons may extend the eligibility period. Leaves for other reasons, including vacation, do not impact the eligibility period.

   ii. Some McGill postdocs have dual status as both students and employees (unionized or non-unionized). Consult the *Graduate and Postdoctoral Studies website* for definitions of Postdoctoral Fellows, Postdoctoral Scholars, and Postdoctoral Researchers.

   iii. Postdocs must conduct research under the supervision of a McGill professor (including Adjunct Professors), qualified in the discipline in which training is being provided and with the ability to fulfil supervisory responsibilities and act as a mentor for career development. Postdocs are expected to engage primarily in research with minimal teaching or other responsibilities.

2. **Registration**

   i. Postdocs must *register* annually with the University through Enrolment Services. Registration will be limited to postdocs who fulfil the definition above, and who meet the eligibility criteria as stipulated on the *Graduate and Postdoctoral Studies website*.

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

iii. Leaves of absence must comply with the Graduate and Postdoctoral Studies Policies for Vacation, Parental/Familial, and Health Leave (see *section 7.3: Vacation Policy for Graduate Students and Postdocs* and *University Regulations & Resources* > Graduate > Regulations > Categories of Students > *: Leave of Absence Status*).

3. Appointment, Funding, Letter of Agreement

i. Postdoctoral appointments may not exceed the registration eligibility period as defined above.

ii. In order to be registered, the postdoc must be assured of financial support other than from personal means during their stay at McGill University. This amount must be equivalent to the minimal stipend requirement set by the University in accordance with guidelines issued by federal and provincial research granting agencies or the collective agreement, as applicable. Funding during parental leave is subject to the conditions of the funding agency or the collective agreement, as applicable.

iii. Postdocs require a *Letter of Agreement for Postdoctoral Education* signed by the postdoc, the supervisor, and the department/unit head or delegate.

iv. Postdocs with full responsibility for teaching a course should be compensated over and above their postdoctoral funding as course lecturers. This applies to all postdocs, except those for whom teaching is part of the award.

v. The amount of research, teaching, or other tasks that postdocs engage in over and above postdoctoral activities should conform to the regulations for postdocs specified by the Canadian research council of their discipline or the collective agreement. This applies to all postdocs, including those whose funding does not come from the Canadian research councils.

4. Privileges

i. Postdocs have the same pertinent rights as the ones granted to McGill students under *mcgill.ca/students/srr*, and those granted by the policies listed at *mcgill.ca/secretariat/policies-and-regulations*.

ii. Postdocs have full graduate student borrowing privileges in McGill libraries through their identity card.

iii. As a general rule, postdocs may take courses for credit as Special Students following the admissions procedures outlined at *mcgill.ca/gradapplicants/apply/prepare/visiting*. *Tuition and other charges* will apply.

iv. Postdocs may be listed in the McGill directory.

v. Access to sports facilities may be purchased on a monthly basis through McGill Athletics and Recreation.

vi. Postdoctoral Fellows and Scholars are mandatory members of the Post-Graduate Students' Society (PGSS) and an annual association fee is automatically charged.

vii. Postdocs are permitted membership in the Faculty Club; an annual fee will be charged for this membership.

viii. Postdocs are encouraged to participate in Professional Development Workshops provided by Graduate and Postdoctoral Studies, and Teaching and Learning services. These sessions are usually free of charge.

ix. Postdocs have access to the services provided by the Ombudsperson.

x. Postdocs may enrol as part-time students in the second language written and spoken English/French courses offered by the School of Continuing Studies/French Language Centre. Postdocs will be charged tuition for these courses. International Postdocs may be required to obtain a CAQ and a Study Permit.

xi. Access to student services is granted to non-unionized postdocs, who are charged the Student Services fee in the Fall and Winter terms, through their student fee accounts.

5. Responsibilities

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; and
- 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; and
- 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* and *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; and
- 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.

7.3 Vacation Policy for Postdocs

Please refer to the *: Vacation Policy for Graduate Students and Postdocs*.

7.4 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* > *Graduate* > *: Leave of Absence Status*).

Such a leave must be requested on a term-by-term basis and may be granted for a period of up to 52 weeks. For a maternity or parental leave, the eligibility period of a maximum of 52 consecutive weeks is determined based on when the child is born; if the leave is interrupted for one or two terms, the eligibility period cannot be extended. Students and Postdocs must make a request for such a leave in writing to their department and submit a medical certificate. The department shall forward the request to Enrolment Services. See the procedure in *University Regulations & Resources* > *Graduate* > *: Leave of Absence Status*.

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."

7.5 Postdoctoral Research Trainees

Eligibility

If your situation does not conform to the Government of Quebec's definition of a Postdoctoral Fellow, you may be eligible to attend McGill as a Postdoctoral Research Trainee. While at McGill, you can perform research only (you may not register for courses or engage in clinical practice). Medical specialists who will have clinical exposure and require a training card must register through Postgraduate Medical Education of the Faculty of Medicine and Health Sciences—not Graduate and Postdoctoral Studies.

The category of Postdoctoral Research Trainee is for:

Category 1: An individual who has completed requirements for the Doctoral degree or medical specialty, but whose degree/certification has not yet been awarded. An individual in this category will subsequently be eligible for registration as a Postdoctoral Fellow.

Category 2: An individual who is not eligible for Postdoctoral Registration according to the Government of Quebec's definition, but is a recipient of an external postdoctoral award from a recognized Canadian funding agency.

Category 3: An individual who holds a professional degree (or equivalent) in a regulated health profession (as defined under CIHR-eligible health profession) and is enrolled in a program of postgraduate medical education at another institution. This individual wishes to conduct the research stage or elective component of their program of study at McGill University under the supervision of a McGill professor. This individual will be engaged in full-time research with well-defined objectives, responsibilities, and methods of reporting. Applications must be accompanied by a letter of permission from the applicant's home institution (signed by the Department Chair, Dean, or equivalent) confirming registration in their program and stating the expected duration of the research stage. Individuals who are expecting to spend more than one year are encouraged to obtain formal training (Master's or Ph.D.) through application to a relevant graduate program.

Category 4: An individual with a regulated health professional degree (as defined under CIHR-eligible health profession), but not a Ph.D. or equivalent or medical specialty training, but who fulfils criteria for funding on a tri-council operating grant or by a CIHR fellowship (up to maximum of five years post-degree).

Note: Individuals who are not Canadian citizens or permanent residents must inquire about eligibility for a work permit.

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/diplomas.
- 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.

8 Graduate Studies Guidelines and Policies

Refer to *University Regulations & 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

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

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

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

- Regulations on Research Policy
- Regulations Concerning the Investigation of Research Misconduct
- Requirements for Research Involving Human Participants
- Policy on the Study and Care of Animals
- 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 sections have been approved for the 2024–2025 session as listed.

11.1 Architecture

11.1.1 Location

Peter Guo-hua Fu School of Architecture
Macdonald-Harrington Building
815 Sherbrooke Street West
Montreal QC H3A 0C2
Telephone: 514-398-6700
Website: *mcgill.ca/architecture*

11.1.2 About Peter Guo-hua Fu School of Architecture

M.Arch. Professional (Non-Thesis) and Ph.D. Programs

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

The **M.Sc. in Architecture** is a non-accredited degree. It is oriented toward students who already hold a professional degree in architecture and wish to acquire advanced research training. Students who hold degrees in other disciplines and wish to pursue research that engages design and architecture are also welcome to apply.

The **M.Arch. Professional** requires the equivalency of the B.Sc. (Arch.) degree for admittance. The M.Arch. Professional program is accredited by the Canadian Architectural Certification Board (CACB) and is recognized as accredited by the *National Council of Architectural Registration Boards* (NCARB) in the U.S.

The **Ph.D. program** is for study beyond the professional degree in architecture. The program has been conceived to respond to the needs of graduates with some professional experience who wishes to acquire more specialized knowledge in architecture. 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.

section 11.1.4: Master of Science (M.Sc.) Architecture (Thesis) (45 credits)

The M.Sc. in Architecture (Thesis) is a research-intensive program of study, focusing on critical skills in research, analysis, experimentation, design research, and interpretation that are applicable in the profession, allied disciplines, and society.

section 11.1.5: 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.

section 11.1.6: Doctor of Philosophy (Ph.D.) Architecture

The McGill University Ph.D. in Architecture is a research degree with a thesis. The foundations 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. All students also participate in the two Doctoral Pro seminars (ARCH 711, ARCH 712) which include investigations of advanced topics introduced by the instructor(s). 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 their supervisory 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.

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.

Ph.D.

Candidates who have an adequate background at the master's level in the proposed area of research are eligible to apply to this program and will be admitted to Ph.D. 2 with the stipulation of additional courses, if necessary.

A working knowledge of a language or languages relevant to the area of research is required.

11.1.3.2 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.

11.1.3.2.1 Additional Requirements

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

Professional Master of Architecture:

- Curriculum vitae
- Applicants are required to upload unofficial transcripts from all universities previously attended (including summer term, exchange term, or study-away term). If you are recommended for admission, you will later be required to supply official transcripts. Transcripts in languages other than English or French must be accompanied by an English or French translation provided by the institution issuing the transcript or by a certified translator. Please refer to *mcgill.ca/gradapplicants/apply/prepare/checklist/documents*.
- 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 (newly updated excel file at number six on the school's application procedures webpage) *mcgill.ca/architecture/programs/professional/prospective-students/application-procedures.*

  Note: Not required by graduates from McGill University B.Sc.(Arch.), Université de Montréal B.Sc.(Arch), Université Laval (B.Sc.Arch.), Toronto Metropolitan University (B.Arch.Sc.), Laurentian University (B.A.S. – Bachelor of Arch. Studies), University of Waterloo (B.Arch.Studies.), University of Manitoba (B.Env.Design), Carleton University (Bachelor of Arch. Studies - Design).

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

  Note: Not required by graduates from McGill University B.Sc.(Arch.), Université de Montréal B.Sc.(Arch), Université Laval (B.Sc.Arch.), Toronto Metropolitan University (B.Arch.Sc.), Laurentian University (B.A.S. - Bachelor of Arch. Studies), University of Waterloo (B.Arch.Studies.), University of Manitoba (B.Env.Design), Carleton University (Bachelor of Arch. Studies - Design).

- A comprehensive e-portfolio (.pdf format, max. 15 MB, due no later than December 15) that may include the following: selected work from previous design studios; examples of project work from other courses; examples of freehand drawing and sketching; examples of professional work: sketches, drawings, images of models, photographs of built work (professional work includes work carried out while employed in architects' offices, as well as personal projects; please identify the architect(s) and your own roles in each project illustrated).

  Note: Please indicate, where applicable, if a project is an individual or group project.

Ph.D.

- Two-page curriculum vitae including a section on research experience and accomplishments (publications, presentations, exhibitions, participation in funded projects, etc). Links and/or DOIs should be provided where applicable.
- Applicants are required to upload unofficial transcripts from all universities previously attended. If you are recommended for admission, you will later be required to supply official transcripts. Transcripts in languages other than English or French must be accompanied by an English or French translation provided by the institution issuing the transcript or by a certified translator. Please refer to *mcgill.ca/gradapplicants/apply/prepare/checklist/documents*.
- Two confidential letters of reference are required for your application. 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*.
- Research proposal: a four-page research proposal, as well as a detailed explanation of why and with whom they wish to study at McGill University’s Peter Guo-hua Fu School of Architecture.
- Written work: a sample of the applicant’s written work, drawn from essays, papers, or other work previously submitted for academic evaluation or publication, and falling within the desired field of graduate study.
- Proof of English language proficiency: 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 oral and written English. Before acceptance, appropriate exam results must be submitted directly from the *TOEFL* (Test of English as a Foreign Language) or *IELTS* (International English Language Testing Systems) Office. An institutional version of the TOEFL is not acceptable. Applications will not be considered if a TOEFL or IELTS test result is not available. For the TOEFL, a minimum overall score of 86 is required on the Internet-based test (iBT), with each component score (i.e., reading, writing, speaking, listening) not less than 20 (the TOEFL Institution Code for McGill University is 0935.) For the IELTS, a minimum overall band score of 6.5 is required. For further information, please refer to *mcgill.ca/gradapplicants/international/proficiency*.

More information is available on the *Peter Guo-hua Fu School of Architecture website*.

11.1.3.3 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 Peter Guo-hua Fu School of Architecture 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*.

Information on application deadlines is available at *mcgill.ca/gradapplicants/how-apply/application-steps/application-deadlines*.

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

11.1.4 Master of Science (M.Sc.) Architecture (Thesis) (45 credits)

The M.Sc. in Architecture (Thesis) is a research-intensive program of study, focusing on critical skills in research, analysis, experimentation, design research, and interpretation that are applicable in the profession, allied disciplines, and society. The program accommodates several areas of study, capitalizing on faculty expertise. It offers flexibility between a written or design-oriented thesis, and promotes close interaction between students and faculty in sponsored and unsponsored research. Original research on architectural, engineering, landscape, and urban issues of interest with implications for the built environment are conducted to develop the student's research skills and competencies for doctoral studies or a leadership role in professional practice.

Required Courses

ARCH 627	(3)	Research Methods
ARCH 630J1	(1)	Research Symposium
ARCH 630J2	(1)	Research Symposium
ARCH 630J3	(1)	Research Symposium
ARCH 694	(3)	Thesis Preparation
ARCH 695	(6)	Detailed Research Proposal
ARCH 696	(18)	Thesis Submission

Complementary Courses (12 credits)

12 credits selected from the following:

ARCH 515	(3)	Sustainable Design
ARCH 517	(3)	Sustainable Residential Development
ARCH 604	(3)	Urban Design Seminar
ARCH 626	(3)	Critical Design Strategies
ARCH 635	(3)	Selected Topics in Housing 1
ARCH 641	(3)	Energy and Environments 1
ARCH 642	(3)	Energy and Environments 2
ARCH 651	(3)	Architectural History and Theory Seminar 1
ARCH 652	(3)	Architectural History and Theory Seminar 2
ARCH 653	(3)	Architectural History and Theory Seminar 3
ARCH 654	(3)	Architectural History and Theory Seminar 4
ARCH 670	(3)	Advanced Landscape Theory
ARCH 675	(3)	Architecture in Global Perspective
ARCH 684	(3)	Contemporary Theory 1
ARCH 685	(3)	Contemporary Theory 2

Other courses at the 500-level or higher, inside or outside the School, if relevant to the program of study, can be approved by the student's supervisor and Graduate Program Director.

11.1.5 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.

Required Courses (42 credits)

ARCH 672	(9)	Architectural Design Studio 1
ARCH 673	(9)	Architectural Design Studio 2
ARCH 674	(3)	Professional Practice 1
ARCH 676	(9)	Advanced Architectural Design
ARCH 678	(3)	Advanced Construction
ARCH 683	(9)	Directed Research Project

Complementary Courses (18 credits)

18 credits chosen from among the following:

ARCH 514	(3)	Community Design Workshop
ARCH 515	(3)	Sustainable Design
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 562	(3)	Innovative Homes and Communities
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 670	(3)	Advanced Landscape Theory
ARCH 675	(3)	Architecture in Global Perspective
ARCH 680	(2)	Field Sketching
ARCH 684	(3)	Contemporary Theory 1
ARCH 685	(3)	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

11.1.6 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.

11.2 Bioengineering

11.2.1 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*

11.2.2 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
- 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 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 the *: Biological and Biomedical Engineering* and the *Biological and Biomedical Engineering website* for further information on this program.

11.3 Chemical Engineering

11.3.1 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: *gradcoordinator.chemeng@mcgill.ca*
Website: *mcgill.ca/chemeng*

11.3.2 About Chemical Engineering

The Department offers programs leading to the **Master of Engineering**, **Master of Science**, and the **Doctor of Philosophy** degrees.

The Department's offices and research laboratories are located in the M.H. Wong Building. Collectively, 18 members of the academic staff conduct research programs in almost all areas of modern chemical engineering, drawing upon theoretical, computational, and experimental methodologies. The Department's faculty have been well supported by government programs (e.g., *NSERC*, *FRQNT*, *CIHR*, *CFI*, and *CRC*) and industry through research partnerships and contracts. Our laboratories are equipped with state-of-the-art equipment, and we attract outstanding graduate students from all over the world. Our main current research areas are briefly described below.

Advanced materials and polymers – The Department has an internationally recognized research program in structural, functional, and biological materials, spanning synthesis, characterization, processing, and modelling activities, with strong links to academic, government, and industrial research centres. Areas include plasma processing (e.g., nanofluids, carbon nanotubes, advanced coatings) and polymeric or "soft" materials research (e.g., self-assembling or structured materials; complex fluids; liquid crystals; colloids and soft composites; and novel polymerization methods). Applications of the research are targeted toward the development of next-generation, high-density storage media, functional coatings, electronic devices, composite fluids and "smart" materials, to name but a few.

Biomedical engineering and biotechnology – The majority of professors in the Department are involved with biological engineering. This is a very broad research area that includes biotechnology and biomedical engineering. Biotechnology is an integrated approach of combining life sciences (e.g., biochemistry and cell biology) with process engineering, design, and scale-up principles. This is the use of biological systems or living organisms to do practical things and manufacture valuable products such as biohydrogen, drugs, therapeutics, polymers, and surfactants. Biomedical engineering combines the principles of engineering with medicine as well as life sciences and biology. Examples of this include:

- drug delivery methods;
- biomedical devices;
- cardiovascular and other biomechanics;
- biomaterials for applications such as artificial implants; and
- products such as bacteriophages for alternative treatment techniques.

Energy – Energy usage has increased significantly since the steam engine launched the Industrial Revolution. This is due to our ever-growing human population, increased production of consumer goods, and rising use of energy-intensive devices such as automobiles, cell phones, computers, and climate comfort units. Instability in oil production and the inevitable depletion of fossil fuels is forcing scientists to find new resources and develop new technologies to keep pace with elevating energy demands. The Chemical Engineering Department at McGill University has an extensive research effort related to energy including:

- hydrogen production from microbial conversion of waste streams and electrolysis of water;
- 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; and
- 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 products and sustainable processes. Using their background in process engineering, environmental chemistry, earth sciences, and biology, engineers have to meet the current and future challenges in protecting, managing, and restoring the environment. Ongoing research in the area of environmental engineering in our department includes:

- the study of wastewater treatment processes;
- biodegradation of emerging pollutants;
- advanced oxidation processes;
- transport and fate of waterborne contaminants;
- production of alternative fuels;
- environmental nanotechnology for remediation of contaminated soils and waters;
- green chemistry for safer products and processes; and
- development of biosensors for pollutant detection.

Plasma science and engineering – Plasma is often called the fourth state of matter, being the result of raising a gas to such an energy level that it contains conducting particles such as electrons and ions. While most of the universe is in a plasma state, plasmas on Earth are relatively uncommon. Plasma science and engineering research examines the use of the plasma state to produce physical and chemical changes to matter (bulk and surfaces). Plasmas may be in non-equilibrium, a state in which the overall gas is at low temperature and only the electrons are very energetic, or in the equilibrium state, where the temperature of all constituents is essentially equal and may range from thousands to tens of thousands of degrees Kelvin (e.g., the sun's surface is in a plasma state, at a temperature of about 6,000K). Non-equilibrium plasmas are used in such applications as the deposition of coatings and functionalization of surfaces, the treatment of cells, and the treatment of harmful gases and liquids. Thermal plasmas are used in the synthesis of advanced materials such as nanoparticles, carbon nanotubes, and coatings, as well as in the treatment of toxic and persistent wastes and metallurgical processing. Both thermal and non-thermal plasmas are currently used and studied in the McGill *Catalytic and Plasma Process Engineering Laboratory*, which forms one of the founding groups of the Plasma-Québec Centre.

section 11.3.4: Master of Science (M.Sc.) 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 11.3.5: 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 11.3.6: 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 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 perspective and awareness of environmental issues. It is a course-oriented degree, which includes prescribed courses related to environmental engineering and a short project completed under the supervision of a Faculty member (professor). Graduate students can specialize in environmental engineering through this program offered in collaboration with the Bieler School of Environment.

section 11.3.7: Doctor of Philosophy (Ph.D.) Chemical Engineering

The Ph.D. is a research degree requiring few courses and an extensive thesis, conducted under the supervision of a Faculty member (professor), that makes a distinct contribution to knowledge. The Ph.D. program prepares candidates for a career in teaching, research, and/or development and graduates are expected to have acquired autonomy in conducting research. McGill also offers various workshops that provide general, transitional, and professional skills development opportunities, preparing candidates for various career options following the Ph.D.

11.3.3 Chemical Engineering Admission Requirements and Application Procedures

11.3.3.1 Admission Requirements

Admission to graduate studies requires a minimum CGPA of 3.0/4.0 (or equivalent) for all degrees combined, or a minimum GPA of 3.2/4.0 (or equivalent) in both the bachelor's and master's degree, over the last two years of each 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, or a minimum *IELTS* (International English Language Testing System) band score of 7 in order to apply.

M.Sc. (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.

11.3.3.2 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.

11.3.3.2.1 Additional Requirements

- Reference Letter – Ph.D. applicants must submit two letters of recommendation, one of which should be from their master's research supervisor.

11.3.3.3 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 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*.

Information on application deadlines is available at *mcgill.ca/gradapplicants/how-apply/application-steps/application-deadlines*.

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.

11.3.4 Master of Science (M.Sc.) Chemical Engineering (Thesis) (45 credits)

The M.Sc. in Chemical Engineering (Thesis) is a research-oriented program that focuses on advanced materials and polymers, biomedical engineering and biotechnology, environmental engineering, energy, plasma science and artificial intelligence-assisted design and optimization. This program offers advanced training in fundamentals as well as research methods, laboratory safety and research ethics and is, therefore, the more relevant program for those whose primary interest is research as well as a suitable preparation for a career in industry.

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
CHEE 688	(4)	Advanced Materials in Chemical Engineering

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.

11.3.5 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.

11.3.6 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 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.

11.3.7 Doctor of Philosophy (Ph.D.) Chemical Engineering

The Ph.D. in Chemical Engineering focuses on advanced materials and polymers, biomedical engineering and biotechnology, environmental engineering, energy, plasma science and artificial intelligence-assisted design and optimization. The program offers advanced training in fundamentals as well as research methods and techniques, laboratory safety and research ethics.

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 (4 credits)

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. 1
CHEE 798	(0)	Ph.D. Seminar 2

Complementary Courses (6-12 credits)

6-12 credits at the 500 level or higher, in consultation with the supervisor and depending on student's background. May include 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
CHEE 688	(4)	Advanced Materials in Chemical Engineering

11.4 Civil Engineering

11.4.1 Location

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

11.4.2 About Civil Engineering

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; infrastructure rehabilitation; risk engineering; fluid mechanics and hydraulics; materials engineering; soil behaviour; soil mechanics and foundations; water resources engineering; environmental engineering; and transportation engineering.

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

section 11.4.4: Master of Science (M.Sc.) 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; 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 11.4.5: 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 option is within the context of the existing M.Eng. (non-thesis) programs currently offered in the Departments of Bioresource Engineering (Agricultural and Environmental Sciences); Chemical Engineering; Civil Engineering; and Mining 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.

section 11.4.6: 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 11.4.7: 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.

11.4.3 Civil Engineering Admission Requirements and Application Procedures

11.4.3.1 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.

11.4.3.2 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.

11.4.3.3 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*.

Information on application deadlines is available at *mcgill.ca/gradapplicants/how-apply/application-steps/application-deadlines*.

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.

11.4.4 Master of Science (M.Sc.) Civil Engineering (Thesis) (45 credits)

The M.Sc. in Civil Engineering focuses on 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. A two- to three-semester independent research project is undertaken in one of these fields, leading to a thesis.

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)	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.

11.4.5 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:

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 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.

11.4.6 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 507	(3)	Wind Engineering
CIVE 520	(3)	Groundwater Hydrology
CIVE 521	(3)	Nanomaterials and the Aquatic Environment
CIVE 527	(3)	Renovation and Preservation: Infrastructure
CIVE 528	(3)	Design of Wood Structures
CIVE 545	()	
CIVE 550	(3)	Water Resources Management

CIVE 557	(3)	Microbiology 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 625	(4)	Condition Assessment of Existing Structures
CIVE 628	(4)	Advanced Design of Wood Buildings
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.

11.4.7 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.

11.5 Electrical and Computer Engineering

11.5.1 Location

Department of Electrical and Computer Engineering
McConnell Engineering Building, Room 602
3480 University Street
Montreal QC H3A 0E9
Telephone: 514-398-7344 or 514-398-1406
Email: *grad.ece@mcgill.ca*
Website: *mcgill.ca/ece*

11.5.2 About Electrical and Computer Engineering

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

The research interests and facilities of the Department are very extensive, involving more than 45 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 focussed 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* Group includes experimental laboratories with high-speed test and measurement equipment and optoelectronics; tunable, high power, and pulsed lasers; extensive optics and optomechanics supporting research in telecommunications for advance probing stations; signal processing, nonlinear optics, RF photonics, optical processors for computing and AI, and biosensing.
- Molecular beam epitaxy infrastructure. This infrastructure can grow wafer-scale group-III nitride epilayers and nanostructures for both photonic/optoelectronic and electronic devices.
- The *Computational Electromagnetics Laboratory* provides tools for numerical analysis, visualization, interface design, and knowledge-based system development.
- For the microwave characterization research, one section of the laboratory hosts dielectric measurement probe in for the low- to high-gigahertz range.
- Additionally, access to a complete range of commercial multi-physics simulation, design, and optimization software is available. The Power Engineering lab also has experimental facilities for the characterization of magnetic and small dynamometer for electrical machine measurements.
- There is also a well-equipped laboratory for power electronics and power systems research (*http://www.power.ece.mcgill.ca/*).
- Computing infrastructure for software engineering research is also available.

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

There are several other universities in Montreal offering graduate-level engineering degrees: Concordia University; *l'Université de Montréal* and its affiliated school of engineering; *Polytechnique Montréal*; *l'Université du Québec*, which includes *l'École de technologies supérieure (ETS)*; and *l'Institut national de la recherche scientifique (INRS)*.

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 Assistantship: The Department awards several graduate assistantship 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 assistantship; all applicants who indicate a need for support on their application forms will be considered.

Teaching Assistantship: Graduate students, with the approval of their supervisors, may also undertake teaching assistantship 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 11.5.4: Master of Science (M.Sc.) Electrical Engineering (Thesis) (45 credits)

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 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 11.5.6: 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 11.5.5: Master of Engineering (M.Eng.) Electrical Engineering (Non-Thesis): Applied Artificial Intelligence (45 credits)

section 11.5.7: 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 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.

11.5.3 Electrical and Computer Engineering Admission Requirements and Application Procedures

11.5.3.1 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.

Master's 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 highly competitive.

Ph.D. Degree Admission Requirements

In addition to satisfying the requirements for the Master's 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 highly competitive.

11.5.3.2 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.

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

11.5.3.2.1 Additional Requirements

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

- Area of Research and Applicant Profile Form – available at *mcgill.ca/ece/admissions/graduate/apply;*
- Area of Interest and Profile Form (M.Eng. course-based program) – available at *mcgill.ca/ece/admissions/graduate/apply*;
- *GRE* – the General Aptitude Test is optional.

11.5.3.3 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 Electrical and Computer 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, and Exchange)**	**Canadian Citizens/Perm. Residents of Canada (Incl. Special, Visiting, and 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 applicants (domestic or international) who wish to be considered for Faculty of Engineering awards must apply by August 1.

All supporting documents must be uploaded to the online application system by the application deadlines.

11.5.4 Master of Science (M.Sc.) Electrical Engineering (Thesis) (45 credits)

The Master of Science in Electrical Engineering (Thesis) 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.

The M.Sc. Thesis program must be completed on a full-time basis in no more than three years. The following requirements must be met:

Thesis Courses (27 credits)

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

Students who choose the thesis option must register for all 27 credits during the three terms of residency.

Complementary Courses (18 credits)

18 credits of 500-, 600-, or 700-level courses, of which no more than 6 credits may be outside the Department.*

* Non-departmental courses require Departmental approval. Students may be allowed to take more than 6 credits of non-Departmental courses; a letter of recommendation from their supervisor outlining the reason for such an action is required.

11.5.5 Master of Engineering (M.Eng.) Electrical Engineering (Non-Thesis): Applied Artificial Intelligence (45 credits)

The Master of Engineering in Electrical Engineering; Non-Thesis - Applied Artificial Intelligence is a professional program of 45 credits. The program provides the foundation for applications of Artificial Intelligence (AI) techniques and experience building an AI system in various fields of interest. The program may be completed on a part-time basis.

Required Courses (14 credits)

ECSE 551	(4)	Machine Learning for Engineers
ECSE 552	(4)	Deep Learning
ECSE 679D1	(3)	Project in Applied Artificial Intelligence
ECSE 679D2	(3)	Project in Applied Artificial Intelligence

Complementary Courses

(18-24 credits)

Group A: Artificial Intelligence Focused

6-8 credits from the following:

ECSE 526	(3)	Artificial Intelligence
ECSE 555	(4)	Advanced Topics in Artificial Intelligence
ECSE 556	(4)	Machine Learning in Network Biology
ECSE 557	(3)	Introduction to Ethics of Intelligent Systems
ECSE 626	(4)	Statistical Computer Vision
ECSE 683	(4)	Topics in Vision and Robotics

Group B: Mathematical Foundations of Artificial Intelligence

3-4 credits from the following:

COMP 540	(4)	Matrix Computations
ECSE 500	(3)	Mathematical Foundations of Systems

ECSE 501	(3)	Linear Systems
ECSE 507	(3)	Optimization and Optimal Control
ECSE 509	(3)	Probability and Random Signals 2
ECSE 543	(3)	Numerical Methods in Electrical Engineering
ECSE 621	(4)	Statistic Detection and Estimation

Group C: Applications of Artificial Intelligence

9-12 credits from the following:

COMP 545	(4)	Natural Language Understanding with Deep Learning
COMP 549	(3)	Brain-Inspired Artificial Intelligence
COMP 558	(4)	Fundamentals of Computer Vision
COMP 565	(4)	Machine Learning in Genomics and Healthcare
COMP 579	(4)	Reinforcement Learning
COMP 585	(4)	Intelligent Software Systems
COMP 588	(4)	Probabilistic Graphical Models
COMP 685	(4)	Machine Learning Applied to Climate Change
ECSE 506	(3)	Stochastic Control and Decision Theory
ECSE 508	(3)	Multi-Agent Systems
ECSE 541	(3)	Design of Multiprocessor Systems-on-Chip
ECSE 544	(4)	Computational Photography
ECSE 546	(4)	Advanced Image Synthesis
ECSE 554	(4)	Applied Robotics
MECH 559	(3)	Engineering Systems Optimization

Elective Courses

(7-13 credits)

7-13 credits at the 500 or 600 level (excluding ECSE 691 to ESCE 697)

* No more than 16 credits in total may be outside the Department. With the exception of courses in the Complementary Courses list, non-departmental courses require Departmental Approval. In exceptional circumstances and with proper justification, students may be permitted to take more than 16 credits of non-Departmental courses; approval from the Graduate Program Director or delegate is required.

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

The Master of Engineering in Electrical Engineering; Non-Thesis program is a professional course-based program of 45 credits. The program provides a solid background in electrical and computer engineering, both in terms of breadth across the entire field and depth in the area of specialty. The program structure allows students to complete the program in three semesters. A part-time program is possible.

Complementary Courses (45 credits)

Full-time students must complete the program in three years.

45 credits of 500- or 600- courses, of which no more than 16 credits may be outside the Department.

Students may not take Thesis Research courses - ECSE 691 to ECSE 697.

* Non-departmental courses require Departmental Approval. In exceptional circumstances and with proper justification, students may be permitted to take more than 16 credits of non-Departmental courses; approval from the Graduate Program Director or delegate is required.

11.5.7 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.

11.6 Mechanical Engineering

11.6.1 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
Email: *grad.mecheng@mcgill.ca*
Website: *mcgill.ca/mecheng/grad*

11.6.2 About Mechanical Engineering

Mechanical engineers are traditionally concerned with the conception, design, implementation, and operation of mechanical systems. Common fields of work include aerospace, energy, manufacturing, machinery, and transportation. Due to the broad nature of the discipline, there is usually a high demand for mechanical engineers with advanced training.

The Department includes more than 30 faculty members and 200 graduate students, and is housed primarily within the recently renovated Macdonald Engineering Building. The Department contains state-of-the-art experimental facilities (including a major wind tunnel facility) and has extensive computational facilities. Professors within the Department collaborate widely with professors in other units, often through research centres including the Centre for Intelligent Machines (CIM); the McGill Institute for Advanced Materials (MIAM); and the Montreal Neurological Institute and Hospital (MNI). The research interests within the Department are very broad and fall largely within the following seven areas:

- Aerodynamics and fluid mechanics
- Biomechanics
- Combustion and energy systems
- 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.

Biomechanics

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

Combustion and Energy Systems

Combustion, shock wave physics, heat transfer, and compressible gas dynamics.

Design and Manufacturing

Design theory and methodology, design optimization; biomimetics; machine tools and systems, manufacturing processes, and management and control; micro/nano machining; and wear and comminution processes.

Dynamics and Control

Multibody systems, legged and wheeled vehicles, compliant mechanisms, and kinematic geometry; tethered systems, lighter-than-air craft, and underwater vehicles; spacecraft dynamics and space robotics; modelling and simulation; fluid–structure interactions, nonlinear and chaotic dynamics; dynamics of bladed assemblies.

Materials and Structures

Composite materials: structural design, analysis, manufacturing, and processing; micro/nano mechanics; MEMS/NEMS; adaptronic structures; thermomechanics, wave propagation, and computational mechanics.

Vibrations, Acoustics, and Fluid–Structure

Vibrations, acoustics, and fluid–structure interaction.

Programs Offered

The Department offers programs of study leading to the M.Sc. and Ph.D. degrees in Mechanical Engineering. Both M.Sc. (Thesis) and M.Eng. (Non-Thesis) programs are offered.

There are several options for completing master's degrees that do not involve the completion of a thesis. The M.Eng. (Non-Thesis) program has more extensive course requirements and will appeal to students who desire to gain both a broad understanding of subjects within Mechanical Engineering as well as in-depth information in a specific area. Other non-thesis master's degree options are described below.

section 11.6.6: Master of Science (M.Sc.) Mechanical Engineering (Thesis) (45 credits)

M.Sc. is a research program requiring a minimum of 45 credits to be distributed as follows: 28 credits of thesis work, a set of one-semester courses with a combined weight of no less than 16 credits, and a one-credit seminar. The M.Sc. program is a full-time program.

section 11.6.4: Master of Engineering (M.Eng.) Mechanical Engineering (Non-Thesis) (45 credits)

Students in this program must complete required courses in addition to several complementary courses and a seminar course. They also complete a project that is less involved than a thesis, and may involve a limited research project or a technical or design study. Graduates of this program are well-prepared for carrying out research and development in industry and may also proceed to further research at the Ph.D. level.

section 11.6.5: Master of Engineering (M.Eng.) Aerospace Engineering (Non-Thesis) (45 credits)

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

The aerospace industry is strongly established in Quebec. Representatives of the aerospace industry therefore requested that measures be taken to provide for qualified scientists in aerospace. Five universities offering courses in engineering came together to offer a master's degree program in the field of aeronautics and space technology. This program is offered to students who wish to specialize in these disciplines. The industry's participation is a special feature of this program. The universities and the participating industries, with the cooperation of the Centre of Aerospace Manpower Activities in Quebec (CAMAQ), have formed a Coordinating Committee, CIMGAS, to arrange for industrial internships and case study courses for the students and to implement specific program developments to meet the needs of the industry.

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 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

section 11.6.7: 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 principal supervisor. Graduates from this program typically proceed to careers in research in either industrial or academic environments.

11.6.3 Mechanical Engineering Admission Requirements and Application Procedures

11.6.3.1 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.Sc. (Thesis) program must hold an undergraduate degree (or equivalent) in Engineering or a degree in Physical, Math, or Computer Sciences.

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.

11.6.3.2 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.

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

11.6.3.2.1 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

11.6.3.3 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 additional documentation requirements well in advance on the Mechanical Engineering's website at *mcgill.ca/mecheng/grad/admission/date*.

Information on application procedures and deadlines is available at *mcgill.ca/gradapplicants/how-apply/application-steps/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 Master of Engineering (M.Eng.) Mechanical Engineering (Non-Thesis) (45 credits)

The Master of Engineering in Mechanical Engineering; Non-Thesis program is a course-based program of 45 credits. The program provides a solid background in mechanical engineering, both in terms of breadth across the entire field and depth in the area of specialty.

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.

11.6.5 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, Polytechnique de Montréal, 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 three areas:

1. Aeronautics and Space Engineering

2. Avionics and Control

3. Aerospace Materials and Structures

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.

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

The M.Sc. in Mechanical Engineering is a research-oriented program that focuses on planning and conducting research as well as organizing and presenting research results, supervised by one or more professors who are experts in the field.

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.

11.6.7 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	(0)	Ph.D. Comprehensive Preliminary Oral Examination

11.7 Mining and Materials Engineering

11.7.1 Location

Department of Mining and Materials Engineering
M.H. Wong Building
3610 University Street
Montreal QC H3A 0C5
Canada
Email: *barbara.hanley@mcgill.ca*
Website: *mcgill.ca/minmat*

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

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

11.7.2 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 Aerospace Materials
- Biomaterials
- Nanomaterials and Nanoelectronic Materials
- Multiscale Modelling of Materials
- Electronic and Solar Cell Materials
- Environmental Engineering

Research Degrees

section 11.7.4: Master of Science (M.Sc.) Materials Engineering (Thesis) (45 credits)

Please consult the Department for more information about the M.Sc. Materials Engineering (Thesis) program.

section 11.7.5: Master of Science (M.Sc.) Mining Engineering (Thesis) (45 credits)

Please consult the Department for more information about the M.Sc. Mining Engineering (Thesis) program.

Direct Transfer from a Master's to a Ph.D. – Students enrolled in a master's program (thesis) may transfer into the Ph.D. program without obtaining a master's degree if they have:

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

Please consult the Department for more information about the M.Eng. Materials Engineering (Project) program.

section 11.7.7: Master of Engineering (M.Eng.) Materials Engineering (Non-Thesis): Environmental Engineering (45 credits)

Please consult the Department for more information about the M.Eng. Materials Engineering (Non-Thesis) program.

section 11.7.8: Master of Engineering (M.Eng.) Mining Engineering (Non-Thesis) (45 credits)

Please consult the Department for more information about the M.Eng. Mining Engineering (Project) program.

section 11.7.9: Master of Engineering (M.Eng.) Mining Engineering (Non-Thesis): Environmental Engineering (45 credits)

Please consult the Department for more information about the M.Eng. Mining Engineering (Non-Thesis) program.

section 11.7.10: Doctor of Philosophy (Ph.D.) Materials Engineering

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

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

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

section 11.7.12: 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.

11.7.3 Mining and Materials Engineering Admission Requirements and Application Procedures

11.7.3.1 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.Sc. (Thesis)** degree is open to graduates holding the B.Eng. degree or its equivalent in Materials Engineering, Mining Engineering or other related engineering fields.; or 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 complete a Qualifying term. Industrial experience is favourably viewed for entrance into the program, but is not considered a necessity.

The Master of Engineering (Project) (Environmental Engineering option) is also offered.

Ph.D. degree applicants may either be “directly transferred” from the M.Eng. or M.Sc. program (see below) or hold an acceptable master's degree in Materials Engineering, Mining Engineering, or other related fields, or under exceptional circumstances may be admitted directly from the bachelor's degree. In the latter case they are admitted to Ph.D. 1 as opposed to those holding a master's degree, who are admitted to Ph.D. 2.

11.7.3.2 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.

11.7.3.3 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*.

Information on application deadlines is available at *mcgill.ca/gradapplicants/how-apply/application-steps/application-deadlines*.

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

11.7.4 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.

11.7.5 Master of Science (M.Sc.) Mining Engineering (Thesis) (45 credits)

The M.Sc. in Mining Engineering focuses on both fundamental and applied research. A two- to three-semester independent research project, leading to a thesis, is undertaken in any research area of mining science, engineering or technology, as well as closely related 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 Courses (6 credits)

MIME 601	(0)	Engineering Laboratory Practice

6 credits from:

MIME 673	(6)	Mining Engineering Seminar

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.

11.7.6 Master of Engineering (M.Eng.) Materials Engineering (Non-Thesis) (45 credits)

The Master of Engineering in Materials Engineering: Non-Thesis program is primarily designed to train people with appropriate engineering or scientific background to allow them to work effectively in the materials industries.

Research Project (15 credits)

MIME 680	(6)	Materials Engineering Project 1
MIME 681	(6)	Materials Engineering Project 2
MIME 682	(3)	Materials Engineering Project 3

Required Courses (6 credits)

MIME 601	(0)	Engineering Laboratory Practice
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.

11.7.7 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:

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

Environmental Impact Course

One of the following courses:

GEOG 601	(3)	Advanced Environmental Systems Modelling

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 Materials Engineering is the following:

MIME 681	(6)	Materials Engineering Project 2

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

The Master of Engineering in Mining: Non-Thesis program 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.

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
MIME 673	(6)	Mining Engineering Seminar

Complementary (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.

11.7.9 Master of Engineering (M.Eng.) Mining Engineering (Non-Thesis): Environmental Engineering (45 credits)

Students are strongly encouraged to consult with the Graduate Program Director prior to enrolling in the program.

Research Project (6 credits)

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
OCCH 616	(3)	Occupational Hygiene

Water Pollution Engineering Course

4 credits from the following:

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

3 credits from the following:

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

Soil and Water Quality Management Course

3-4 credits from the following:

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

Environmental Impact Course

3 credits from the following:

GEOG 601	(3)	Advanced Environmental Systems Modelling

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

Environmental Policy Course

3 credits from the following:

URBP 506	(3)	Environmental Policy and Planning

or 3 credits approved at the 500-, 600-, or 700-level alternative.

Elective Courses (10-11 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 Engineering is the following:

MIME 629	(6)	Mineral Engineering Project 2

11.7.10 Doctor of Philosophy (Ph.D.) Materials Engineering

Candidates for this degree must complete a minimum of two lecture courses assigned by the Department,

selected on the basis of previous academic training and research interests. Candidates must also pass a safety training course, participate in an appropriate Research Seminar course, and take a preliminary examination within their first year of Ph.D. study.

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 be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (9 credits)

MIME 601	(0)	Engineering Laboratory Practice
MIME 701	(0)	Ph.D. Thesis Research Proposal
MIME 703	(0)	Ph.D. Comprehensive Exam
MIME 710D1	(1.5)	Ph.D. Foundation Course
MIME 710D2	(1.5)	Ph.D. Foundation Course
MIME 771	(6)	Research Seminar 2

Complementary Courses (6 credits)

6 credits of courses at the 500 level or higher, approved by their supervisor.

11.7.11 Doctor of Philosophy (Ph.D.) Mining Engineering

Candidates for this degree must complete a minimum of two lecture courses assigned by the Department, selected on the basis of previous academic training and research interests. Candidates must also pass a safety training course, participate in an appropriate Research Seminar course and, take a preliminary examination within their first year of Ph.D. study.

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 (6 credits)

MIME 601	(0)	Engineering Laboratory Practice
MIME 702	(0)	Ph.D. Preliminary Examination
MIME 704	(0)	Ph.D. Comprehensive Examination in Mining Engineering
MIME 776	(6)	Ph.D. Research Seminar

Complementary Courses (6 credits)

6 credits of courses at the 500 level or higher, approved by their supervisor.

11.7.12 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.

11.8 Trottier Institute for Sustainability in Engineering and Design (TISED)

11.8.1 Location

TISED
Lorne M. Trottier Building, Room 2054
3630 University Street
Montreal, QC, H3A 2B3
Email: *tised@mcgill.ca*
Website: *mcgill.ca/tised*

11.8.2 About TISED

Established in 2012 through a gift from the Trottier Family Foundation, TISED supports research and offers courses on sustainability in engineering and design at the Faculty of Engineering and informs and educates decision-makers and the public about sustainability issues.

TISED's membership comprises tenured and tenure-track professors from across six departments and two schools at the Faculty of Engineering who conduct research related to TISED's research themes:

- sustainable industrial processes and manufacturing;
- renewable energy and energy efficiency;
- sustainable infrastructure and urban development; and
- climate change adaptation and resilience.

section 11.8.3: Master of Engineering (M.Eng.) Sustainability in Engineering and Design (Non-Thesis) (45 credits)

TISED offers an M.Eng. in Sustainability in Engineering and Design with a broad sustainability training in an interdisciplinary environment. The program—open to students with an undergraduate degree in engineering, urban planning, or architecture—offers advanced training in fundamental and contemporary concepts of sustainability and equips students with specific skills to understand and address critical sustainability challenges in the practice of engineering, architecture, and urban planning.

The interdisciplinary format of the program allows students to learn to integrate non-engineering disciplines and systems-based approaches, such as industrial ecology and life-cycle assessment, into their engineering and design solutions. Program graduates will understand the broad ramifications of sustainability and its interplay with engineering and design and be able to implement sustainable engineering and design solutions within the context of broader sustainability theory for their future employers in industry, government, or academia.

For more information regarding the program, please consult the *TISED website*.

11.8.3 Master of Engineering (M.Eng.) Sustainability in Engineering and Design (Non-Thesis) (45 credits)

The Master of Engineering in Sustainability in Engineering and Design; Non-Thesis, focuses on the critical sustainability challenges of the 21st century. The program provides students with the opportunity to apply systems-based frameworks and sustainability metrics to analyze problems and design solutions for sustainability in engineering and design. It provides an interdisciplinary working environment for those working on sustainability.

Required Courses (27 credits)

SEAD 500	(3)	Foundations of Sustainability for Engineering and Design
SEAD 510	(4)	Energy Analysis
SEAD 520	(3)	Life Cycle-Based Environmental Footprinting
SEAD 530	(3)	Economics for Sustainability in Engineering and Design
SEAD 540	(3)	Industrial Ecology and Systems

SEAD 550	(3)	Decision-Making for Sustainability in Engineering and Design
SEAD 660	(3)	Strategies for Sustainability
SEAD 670	(5)	Collaborative Design for Sustainability

Complementary Courses (18 credits)

Students will take 12 to 18 credits from courses in one or two streams:

Stream 1 - Sustainable Processes and Manufacturing

CHEE 511	(3)	Catalysis for Sustainable Fuels and Chemicals
CHEE 521*	(3)	Nanomaterials and the Aquatic Environment
CIVE 521*	(3)	Nanomaterials and the Aquatic Environment
CIVE 663	(4)	Environmental Fate of Organic Chemicals
CIVE 677	(4)	Water-Energy Sustainability
MECH 534	(3)	Air Pollution Engineering
MECH 560	(3)	Eco-design and Product Life Cycle Assessment
MIME 511	(3)	Advanced Subsurface Ventilation and Air Conditioning
MIME 588	(3)	Reliability Analysis of Mining Systems
URBP 506	(3)	Environmental Policy and Planning

* Students can take only one of CHEE 521 or CIVE 521

Stream 2 - Renewable Energy and Energy Efficiency

CHEE 511	(3)	Catalysis for Sustainable Fuels and Chemicals
CIVE 677	(4)	Water-Energy Sustainability
ECSE 562	(4)	Low-Carbon Power Generation Engineering
MECH 534	(3)	Air Pollution Engineering

Stream 3 - Sustainable Urban Development

ARCH 515	(3)	Sustainable Design
ARCH 517	(3)	Sustainable Residential Development
ARCH 564	(3)	Design for Development
MECH 534	(3)	Air Pollution Engineering
URBP 504	(3)	Planning for Active Transportation
URBP 551	(3)	Urban Design and Planning
URBP 620	(4)	Transport Economics
URBP 651	(3)	Redesigning Suburban Space

Stream 4 - Sustainable Infrastructure

ARCH 515	(3)	Sustainable Design
ARCH 564	(3)	Design for Development
CIVE 540	(3)	Urban Transportation Planning
CIVE 621	(4)	Sustainable Design of Municipal Systems

CIVE 623	(4)	Durability of Construction Materials
CIVE 629	(4)	Sustainable Design: Water and Wastewater Facilities
CIVE 652	(4)	Bioprocesses for Wastewater Resource Recovery
SEAD 515	(3)	Climate Change Adaptation and Engineering Infrastructure
URBP 620	(4)	Transport Economics
URBP 651	(3)	Redesigning Suburban Space

Up to 6 credits from the following:

BIEN 520	(3)	High Throughput Bioanalytical Devices
BREE 518	(3)	Ecological Engineering
BREE 520	(3)	Food, Fibre and Fuel Elements
CHEE 541	(3)	Electrochemical Engineering
CHEE 543	(3)	Plasma Engineering
CIVE 550	(3)	Water Resources Management
ECSE 507	(3)	Optimization and Optimal Control
MECH 535	(3)	Turbomachinery and Propulsion
MECH 559	(3)	Engineering Systems Optimization
MIME 556	(3)	Sustainable Materials Processing
SEAD 600	(3)	Sustainability Research 1
SEAD 602	(3)	Sustainability Research 2
URBP 619	(4)	Land Use and Transport Planning

NOTE: * Students must find a supervisor from a McGill engineering, urban planning or architecture program before registering for SEAD 600 and SEAD 602, subject to approval by the program director.

NOTE: Other unlisted 500 level or higher courses taught at McGill may be permitted, subject to approval by the program director.

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: *mcgill.ca/urbanplanning*

11.9.2 About Urban Planning

Urban planning is the set of processes by which a communities shape their environments to meet their needs and to realize their aspirations for the future. 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 profession of urban planning 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 improving cities in terms of health, safety, efficiency, equity, beauty, identity, etc. Today, people who enter the profession come from diverse backgrounds as well, including the design professions, engineering and applied sciences, environmental and social studies, and other fields. Their chief task is to reinvent tools, procedures, and processes to meet new challenges in making metropolitan areas socially, economically, and environmentally resilient and just. A key feature of planning education is learning to view issues in a multidisciplinary way, to manage processes of collaboration and of conflict, and to generate equitable and efficient solutions to complex problems of growth and development.

section 11.9.4: Master of Science (M.Sc.) Urban Planning, Policy and Design (Thesis) (45 credits)

The M.Sc. in Urban Planning, Policy and Design (Thesis) is centred on an independent research thesis. Original research on an urban issue of interest with implications for planning, policy or design will be conducted. The program focuses on critical skills in research, analysis, and interpretation that are applicable in both academia and practice.

The Master of Science (M.Sc.) in Urban Planning, Policy and Design is a thesis-based program. The three-term program of study provides students with a strong understanding of urban dynamics and assists them in developing and carrying out their research. Prospective students propose a topic for an independent research project supervised by a faculty member in the School. Students in the program develop, initiate, and complete the research project over 16 months. Supporting coursework is in planning history and theory, methods, research design, and topics relevant to the student's research.

Further information on the M.Sc. is available at *mcgill.ca/urbanplanning/programs*.

section 11.9.5: Master of Urban Planning (M.U.P.) Urban Planning (Non-Thesis) (60 credits)

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 core program provides a general education in spatial planning in its functional, environmental, and social dimensions. Formal specializations are available in Transportation Planning and Urban Development & Urban Design. Further information concerning these concentrations is available at mcgill.ca/urbanplanning/programs. In all cases, electives, the summer internship, and the Supervised Research Project allow for individual concentration on a particular topic.

section 11.9.6: Master of Urban Planning (M.U.P.) Urban Planning (Non-Thesis): Transportation Planning (60 credits)

The Transportation Planning concentration enables students to specialize in this field as part of their course of study for the M.U.P. degree. A number of core courses and electives, the summer internship, and the Supervised Research Project must be devoted to the acquisition of skills (including in quantitative analysis) necessary to work as a transportation planner. Admission into the concentration is based on a competitive selection process at the end of the first year of study in the M.U.P. program.

section 11.9.7: Master of Urban Planning (M.U.P.) Urban Planning (Non-Thesis): Urban Development and Urban Design (60 credits)

The Urban Development and Urban Design concentration produces graduates who are skilled in analysis and design for development in existing (sub)urban landscapes and urbanizing contexts, whether in North America or elsewhere. A series of courses on urban design, real estate, the politics of development, and urban governance enhance the core curriculum of the professionally-accredited M.U.P. program. Additional courses address innovative approaches to urban development, contemporary urban form, community-based design, globalization and development, and the adaptive redesign of suburban contexts; in addition to enduring topics such as housing, public space, cultural landscapes, and environmental planning. Students seeking to specialize in Urban Development and Urban Design apply at the end of their first year of study; admission into the concentration is based on performance in the first year of study and demonstration of spatial literacy, numeric competency, communication skills, and understanding of complex development processes.

section 11.9.8: Doctor of Philosophy (Ph.D.) Urban Planning, Policy and Design

The Ph.D. in Urban Planning, Policy and Design prepares students for advanced research and teaching on the processes that govern the management, development, and evolution of towns and cities. During the first two years, under their supervisor's and advisory committee's guidance, students follow courses, refine their research topic, and explore their area of expertise, leading up to comprehensive and proposal exams. They then proceed to write and submit a thesis based on their own original research.

11.9.3 Urban Planning Admission Requirements and Application Procedures

11.9.3.1 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* and *mcgill.ca/urbanplanning/how-apply* for detailed application procedures.

Note: The M.U.P. program is not offered on a part-time basis.

11.9.3.1.1 Additional Requirements

The items and clarifications below are additional requirements set by this department for the **Master of Science (M.Sc.) Urban Planning, Policy and Design**. Applicants are required to upload:

- A current version of your curriculum vitae.
- A statement of your research objectives, not exceeding two pages, including:
  - An explanation of your motivation for pursuing the M.Sc. degree in Urban Planning, Policy, and Design;
  - A clearly-articulated but concise discussion of your research interests, proposed topic, and methods, with citations; and
  - The identification of potential faculty supervisors for your research.
- Two letters of recommendation, at least one of which must be from a current or past professor.
- 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 recognized foreign institution where English is the language of instruction or from a recognized 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 TOEFL is a score of 100 on the Internet-based test (iBT), with each component score not less than 23. The minimum score for the IELTS test is 7.0, with a score of at least 6.5 for each component.
- Two examples of independent written work (e.g., course papers, articles, chapters, research reports) in English or in French.

The items and clarifications below are additional requirements set by this department for the **Master of Urban Planning (M.U.P) program**. Applicants are required to upload:

• A personal statement of one to two pages, explaining your motivation for applying to the School, area(s) of specific interest, and longer-term career goals.

• A current version of your curriculum vitae.

• Two letters of recommendation, at least one of which must be from a current or past professor.

- Proof of English proficiency. Minimum score the same as for the M.Sc. Urban Planning, Policy, and Design program.

The items and clarifications below are additional requirements set by this department for the **Doctor of Philosophy (Ph.D.) Urban Planning, Policy and Design**: As an applicant you are required to upload:

- A current version of your curriculum vitae.
- A statement of research objectives, not exceeding three pages, including:
  - An outline of long-term career goals;
  - An explanation of why you believe that a Ph.D. in UPPD would help you achieve those goals; and
  - A clearly-articulated but concise discussion of research interests, intended research plans, and proposed methodological approaches.
- Three letters of recommendation, at least two of which must be from a current or past professor.
- Proof of English proficiency. Minimum scores are the same as for the M.Sc. Urban Planning, Policy, and Design program.
- Two examples of independent written work (e.g., course papers, articles, chapters, research reports) in English or in French.

Awards and Financial Assistance

The Admissions Committee decides the allocation of internal awards for incoming students after the application deadline, and they are allocated, in part, based on merit; no special application is needed to be considered for this funding. Canadian students can also enter the program with a major external fellowship from a government funding agency such as *SSHRC* or *NSERC*. Descriptions of the external awards can be found at *mcgill.ca/gps/funding*.

11.9.3.2 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 School of Urban Planning 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*.

Information on application deadlines is available at *mcgill.ca/gradapplicants/how-apply/application-steps/application-deadlines*.

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

11.9.4 Master of Science (M.Sc.) Urban Planning, Policy and Design (Thesis) (45 credits)

The M.Sc. in Urban Planning, Policy and Design (Thesis) is centred on an independent research thesis. Original research on an urban issue of interest with implications for planning, policy or design will be conducted. The program focuses on critical skills in research, analysis and interpretation that are applicable in both academia and practice.

Required Courses (27 credits)

URBP 606D1	(3)	Research Seminar
URBP 606D2	(3)	Research Seminar
URBP 612	(3)	History and Theory of Planning

URBP 690	(18)	Thesis Submission

Complementary Courses (12 credits)

3 credits selected from the following research methods courses:

URBP 505	(3)	Geographic Information Systems
URBP 608	(3)	Advanced GIS Applications
URBP 633	(3)	Research Methods for Planners
URBP 640	(1)	Introduction to Planning Statistics
URBP 641	(1)	Reading the Urban Landscape
URBP 642	(1)	Introduction to Planning Data
URBP 643	(1)	Selected Geographic Information Systems Applications
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

Note: Students may also take research methods courses at the 500 or 600 level in other academic units at McGill or another Montreal university, subject to the approval of the School.

9 credits selected from among the 500 or 600 level URBP courses offered by the School.

Elective Courses (6 credits)

6 credits offered at the 500 or 600 level by any academic units at McGill or at another Montreal university, with the approval of the School, if they are related to one or more subject areas in the field of planning. Choices usually include courses in urban geography, sociology, anthropology, law, politics, and environmental science. Students must confirm with the Thesis Supervisor prior to registration that the selected course(s) can be counted toward the M.Sc. program.

11.9.5 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)	Visual Communication 1
URBP 610	(1)	Visual Communication 2
URBP 611	(1)	Data Visualization for Planning
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

9-18 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 505	(3)	Geographic Information Systems
URBP 506	(3)	Environmental Policy and Planning
URBP 514	(3)	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 643	(1)	Selected Geographic Information Systems Applications
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 B

0-9 credits from the following:

0-9 credits at the 500 or 600 level of coursework offered 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.

11.9.6 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)	Visual Communication 1
URBP 610	(1)	Visual Communication 2
URBP 611	(1)	Data Visualization for Planning
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
URBP 643	(1)	Selected Geographic Information Systems Applications

Group B

0-6 credits

0-6 credits of coursework at the 500 or 600 level offered by any 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. degree.

11.9.7 Master of Urban Planning (M.U.P.) Urban Planning (Non-Thesis): Urban Development and Urban Design (60 credits)

The concentration in Urban Development and Urban Design aims to produce graduates who are skilled in analysis and design for development in existing (sub)urban landscapes and urbanizing contexts, whether in North America or elsewhere. A series of courses on urban design, real estate, the politics of development, and urban governance enhance the core curriculum of the professionally-accredited M.U.P. program. Additional courses address innovative approaches to urban development, contemporary urban form, community-based design, globalization and development, and the adaptive redesign of suburban contexts, in addition to enduring topics such as housing, public space, cultural landscapes, and environmental planning. Students seeking to specialize in Urban Development and Urban Design apply at the end of their first year of study; admission into the concentration is based on performance in the first year of study and demonstration of spatial literacy, numeric competency, skills in graphic communication, and understanding of complex development processes.

Required Courses (45 credits)

URBP 553	(3)	Urban Governance
URBP 609	(1)	Visual Communication 1
URBP 610	(1)	Visual Communication 2
URBP 611	(1)	Data Visualization for Planning
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 (15 credits)

Group A

9-15 credits from the following:

URBP 505	(3)	Geographic Information Systems
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 B (0-6 credits)

0-6 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	(3)	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 643	(1)	Selected Geographic Information Systems Applications
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.

11.9.8 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 Director.

Elective Courses (3 credits)

Minimum 3 credits at the 500 level or higher,, or more if the Advisory Committee so decides.

These credits may be taken in any academic unit at McGill or at another university, subject to the approval of the Advisory Committee.

The Advisory Committee may require that the number of electives be increased to improve the student's preparation in certain areas. Other courses, at the 500 level or higher, may be added with the approval of the Advisory Committee. In general, students will be asked to limit their elective coursework to 9 credits. In no case will they be allowed to take more than 15 credits in elective courses.

Up to two reading courses may be taken and only one may be included in the minimum 18 credits of course work. A reading course is taken when no appropriate course is available and is (at least) equivalent to a 3-credit course in terms of work load. Procedures for reading courses are outlined in the Reading Course guidelines.