Academic Regulations

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Academic Year

The academic year begins with a Summer Session (May to August) followed by a Regular Session (September to April).

Summer Session:
The Summer Session covers all courses offered from the beginning of May and the end of August.

Regular Session:
The Regular Session is divided into a Fall Term (September to December) and a Winter Term (January to April), each of 15 weeks' duration, including an examination period. The Academic Calendar at the beginning of this publication contains precise dates for the beginning and end of classes.

Residence

Minimum Residence for Doctoral Degrees. The minimum residence requirement for a doctoral degree is 6 terms (two years) of full-time graduate study beyond the master's degree, or the equivalent in part-time study, or 9 terms (3 years) of full-time graduate study beyond the bachelor's degree for those students who are permitted to enroll for doctoral studies without completing a master's degree. It should be understood that this is a minimum requirement, and that a longer period may be necessary in order to complete all the work that is required for the degree. In special circumstances, departments may permit or require candidates to spend a period of time in residence at another institution, subject to the approval from the School of Graduate Studies. When such arrangements are made, it is understood that the candidate will be engaged in full-time study, and that the institution will be able to provide appropriate supervision and research facilities. In all cases, candidates for a doctoral degree from Concordia University must complete at least two years of graduate study at this university, including the final year of the required residence period.

Minimum Residence for Master's Degrees. The minimum residence requirement for the master's degree is 3 terms (one year) of full-time study, or the equivalent in part-time study. This requirement must be met regardless of the amount of graduate work previously completed in any other program or at any other university. Certain master's programs require longer periods of minimum residence.

Beyond Program Requirements. Courses which are completed, but not counted towards a degree or diploma, may be identified on the record as *Beyond Program Requirements - Extra Credits*.

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Time Limits

Students who exceed the time limit as outlined below will be withdrawn from their program. Under exceptional circumstances a time limit may be extended upon the recommendation of the Graduate Program Committee and the approval of the Dean of Graduate Studies.

Duration of Programs. It is expected that full-time students will complete the requirements for most Doctoral Degree programs within 12 terms (4 years). It is also expected that full-time students will complete the requirements for Master's/Magisteriate degree programs within 6 terms (2 years). It should be noted, however, that the duration of MFA, IMBA and MIM programs is different. Details are listed below.

Time Limits for Doctoral Degrees. All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of original registration in the program.

Time Limits for Master's/Magisteriate Degrees. All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at

Concordia University; for part-time students the time limit is 15 terms (5 years). In the case of the MBA (Investment Management Option) and the Master in Investment Management programs, the time limit for full-time students is 15 terms (5 years). In the case of the MBA, the time limit for full-time students is 9 terms (3 years). In the case of the EMBA, the time limit for full-time students is 6 terms (2 years).

Time Limits for Diploma Programs. All work for a diploma program must be completed within 6 terms (2 years) from the time of initial registration in the program for full-time students; for part-time students the time limit is 12 terms (4 years). Students in the Diploma in Investment Management are expected to complete the Diploma in no more than four years from the year of initial registration in the program.

Time Limits for Graduate Certificate Programs. All work for a graduate certificate program must be completed within 6 terms (2 years) from the time of initial registration in the program for full-time students; for part-time students the time limit is 12 terms (4 years). In the case of the graduate certificate in Management Accounting, the time limit is 9 terms (3 years).

Academic Standing

The academic progress of graduate students is monitored on a periodic basis. To be permitted to continue in the program, students in master's and doctoral programs must maintain a cumulative Grade Point Average (GPA) of at least 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program. Individual programs may have more stringent GPA regulations; students should check their program's calendar entry or with the Graduate Program Director

Students in graduate diploma and graduate certificate programs must maintain a minimum GPA of 2.70 during their program of study in order to be considered in good academic standing. Students whose GPA falls below 2.70 are considered to be on academic probation during the following review period. Students whose GPA falls below 2.70 for two consecutive review periods are withdrawn from the program. Individual programs may have more stringent GPA regulations; students should check their program's calendar entry or with the Graduate Program Director

Students in qualifying programs or concurrent qualifying programs in undergraduate courses will be assigned a grade in accordance with the undergraduate grading system. For all courses a *B* grade is required in order to ensure that the minimum standards of the graduate grading system are maintained. In addition, students must meet specific program requirements for good academic standing. Any grade lower than a *C* will be considered a failing grade and in such cases students will be withdrawn from the degree or diploma program for which these courses are required.

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Thesis Supervision

Students who do not have a supervisor when required by their program will be withdrawn from that program. Students may request to be allowed to remain registered in the program after this point for a maximum of four months in order to secure a new supervisor.

C Rule

Graduate students who receive more than one C grade during the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the Dean of Graduate Studies. Course-based programs in the John Molson School of Business apply a term-by-term GPA requirement. Students should refer to the section on Academic Standing in their program's calendar entry. Students who have been withdrawn may apply for re-admission (see Re-Admission of Withdrawn Students in Graduate Admission section). Students who receive another C after re-admission will be withdrawn from the program and will not be considered for re-admission. Individual programs may have more stringent regulations; students should check their program's entry or with the Graduate Program Director

F Rule

Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the Dean of Graduate Studies. If withdrawn from program, students may apply for re-admission (see Re-Admission of Withdrawn Students in Graduate Admission section). Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.

GPA Graduation Requirement

In order to graduate, students in doctoral and master's programs must have a cumulative GPA of at least 3.00. Students in diploma and graduate certificate programs must have a cumulative GPA of at least 2.70 in order to graduate. Individual programs may have more stringent regulations; students should check their programs' regulations or with the Graduate Program Director

Graduation Application

Degree, diploma, and certificate candidates who expect to complete their program requirements in a particular term must apply to graduate by filling out the online Graduation Application Form. The form should be completed by **January 15** for spring graduation and **July 15** for fall graduation.

Note: In programs requiring a master's or doctoral thesis, there are deadlines for thesis submission which must be met if a student is to graduate at a particular graduation. These deadlines are outlined in the Academic Calendar

Credit System

Concordia University has adopted a system of assigning credits to the components of its graduate programs. This system was recommended by the Conseil des Universités du Québec for implementation in all the universities of the Province of Québec. The fundamental concepts in this system are defined in the Rapport du Conseil des Universités sur les Diplômes Universitaires. The credit base takes into account the total activity of the student in terms of lectures, seminars, conferences, laboratories, studio or practice periods, practica, and research, including, where appropriate, the number of hours of personal work required, as estimated by the university. A credit is considered to represent a minimum of 45 hours devoted by the student to an educational activity as described above.

Language of Instruction

While the language of instruction in Concordia University is normally English, students have the right to write their assignments and examinations in French. It must be understood, however, that in a case where a professor cannot read French, the assignments and examinations must be read by another professor, with possible disadvantages and delays for the student. Students are advised to enquire of the instructor at the beginning of the course whether assignments and examinations written in French will be read personally by the professor. Notwithstanding the above, language and literature departments may require assignments and examinations to be written in the language being studied.

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Grading System

The grades and other notations described and defined in this section are those used for the evaluation of graduate courses and certain other graduate degree and diploma components. Some programs have academic regulations supplementing these definitions and descriptions. Such additional regulations define what is required in terms of grades for a student to be considered *in good standing* in a program. Refer to the relevant program section of this calendar and, where the academic regulations for a program have not been stated, consult the Graduate Program Director. Grades used for graduate courses or courses taken as part of a graduate program are *A+*, *A*, *A-*, *B+*, *B*, *B-*, *C*, *Pass*, *F*, *Fail*, *Fail/Absent (F/ABS)*, *Audit* and *In Progress (IP)*.

The weight accorded to the various elements of the performance of each student is at the discretion of the instructor or instructors responsible for the course. At the beginning of a course the instructor will provide students with the evaluation scheme in writing. The scheme cannot be altered without appropriate notice.

- Each doctoral and master's program has a rule which limits the number of *C* grades a student may obtain, and still meet the degree requirements. Diploma and Certificate programs also limit the number of *C* grades a student may obtain. (See C Rule above).
- *Fail* or *F* describes work below the acceptable standard in a course. When a student receives a *Fail*, *F* or a *Fail/Absent (F/ABS)* grade in any course taken as part of a graduate program, it is the responsibility of the department or Faculty to recommend to the School of Graduate Studies whether or not the student should be permitted to continue in the program.
- *Fail/Absent (F/ABS)* is used when the instructor at the end of the course has not received the required work and has not granted an extension of the deadline. It is a permanent grade.
- Using the grade point equivalents listed below, *grade point averages* are calculated and used to measure academic achievement: *A*+ = 4.30, *A* = 4.00, *A*- = 3.70, *B*+ = 3.30, *B* = 3.00, *B*- = 2.70, *C* = 2.00, *Fail* = 0, *F* = 0 and *Fail/Absent (F/ABS)* = 0.
- *Audit* is the grade assigned to courses that are not taken for credit and which do not count towards the completion of a program. A course taken for this grade must be so designated at the beginning of the term. Students may audit a graduate course with permission of the Graduate Program Director of the program in which the course is offered, once the director is satisfied that the student is qualified to take the course. Auditing students are expected to attend class, but are not required to complete assignments or write examinations.
- The *In Progress (IP)* notation is used when a student, who has completed a substantial portion of the course, cannot complete the course in time for reporting grades due to circumstances beyond their control. This notation may be assigned only to individual students, not to entire classes. The *IP* notation is only used in combination with a valid course grade (e.g. "*B*/*IP*", "*F*/*IP*"). The grade is assigned on the basis that the missing work is graded as zero **and included** in calculating the overall grade. Students must complete courses with *IP* notations **by the DNE deadline** of the following term or the Fall DNE deadline for Summer term courses (see Academic Calendar for precise dates). If the course is not completed, the *IP* notation will be removed at the DISC deadline and an *INC* notation will be recorded along with the grade and the grade will become the permanent grade. If the course is completed after the DNE deadline the grade will not be changed (e.g. "*B*/*INC*", "*F*/*INC*"). The Incomplete (*INC*) notation is used to indicate that the student did not complete the required work for the course.

  Under exceptional circumstances an additional period of In Progress Extension (*IPE*) may be granted by the School of Graduate Studies. Requests for an *IPE* notation should be submitted as a student

request, supported by relevant documentation including confirmation of the instructor's support for a further extension prior to the DNE deadline.

Either graduate programs or the School of Graduate Studies may prevent/remove course registrations on the basis of outstanding *IP*/*IPE* notations on the student record.

Grades with *IP* or *IPE* notations are not included in GPA calculations.

Grades with an INC notation are included in the GPA calculations.

Students with *F*/*IP* (or *F*/*IPE*) will not be considered for a Leave of Absence until the program recommends continuance (May Continue). The student will be required to complete the course(s) with *IP*/*IPE* notations by the DNE deadline following their return from Leave.

Academic Term	IP Deadline to submit outstanding work	IPE deadline to submit outstanding work
Summer Term	September 17, 2012	December 20, 2012
Fall Term	January 20, 2013	April 30, 2013

- *Accepted (ACC) or Rejected (REJ)* is the final grade given to a thesis or thesis-equivalent. Under exceptional circumstances, the School of Graduate Studies can apply a grade of *F*.
- *Pass or Fail* is the final grade normally given to comprehensive examinations, internships and language proficiency examinations. Students who fail a comprehensive examination may be permitted to sit for a second examination. Students who fail a language proficiency examination may be permitted to make no more than two further attempts to satisfy the requirement.

In addition, the following are notations which are not grades:

- *Discontinued (DISC)* is used to indicate that the student withdrew from the course in question before the withdrawal deadline. Discontinued courses and notations are recorded on official transcripts.
- *Medical (MED)* is used on students' records to indicate that long-term illness has rendered it not possible for the student in question to complete the academic requirements of a given course or activity. It is a permanent notation; it has no grade point equivalent.
- *No Credit (No-Cr)* indicates that a student has not fulfilled the requirements of the course. This notation is limited to the Diploma in Chartered Accountancy program, which is recognized as a qualification to write the Uniform Final Examination (UFE), and it applies only to ACCO 685. A

student receiving a No-Cr notation must repeat the course in the next semester in which the course is offered.

- *Pending (PEND)* is used when a grade has not been reported at the time of production of a transcript.
- *Replace (REPL)* indicates that the credit earned for this course cannot be retained because it will be replaced with another course as specified by the program. The grade will contribute to the CGPA.
- *Repeat (REPT)* indicates that the credit earned for this course cannot be retained because it is a repetition of a course, or of similar course material, already completed. The grade will contribute to the CGPA.

In cases where the original grade is not calculated correctly, the final grade can be altered.

Grade Submission Deadlines

All final grades for all courses are required to be submitted no later than seven calendar days after the University's last scheduled final examination.

Supplemental Examinations

Graduate students are not permitted to write supplemental examinations.

Comprehensive Examinations

Comprehensive examinations are under the auspices of individual programs and students are advised to consult with their Graduate Program Director concerning program regulations. While the School of Graduate Studies' general regulations permit a student to write comprehensive examinations a second time, individual programs may have a more stringent regulation in this regard (i.e., not permitting a second writing) and students should verify this with the program. Comprehensive examinations are graded as Pass or Fail. In cases where two attempts are permitted, an initial grade of fail is not reported on the student's academic record or academic transcript.

Note: Unless expressly permitted by the instructor, the possession of electronic communication devices is prohibited during examinations.

Admission

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All graduate programs offered by Concordia University, except for the Individualized Program (INDI), are attached to one of the three Faculties or to the John Molson School of Business. The Individual Program (INDI) is attached to the School of Graduate Studies. All graduate programs are under the general supervision of the Council of the School of Graduate Studies and its chair, the Dean of Graduate Studies.

A listing of all current degree programs and fields of advanced study is provided in the Programs section. The degree programs are described fully in the Calendar's Faculty sections: Faculty of Arts and Science, Faculty of Engineering and Computer Science, Faculty of Fine Arts, John Molson School of Business, and the School of Graduate Studies. Existing degree programs are a reflection of research interests, of the professors and researchers on staff, and of the needs of the community served by the University. Inquiries concerning these degree programs should therefore be sent to the relevant program.

In conjunction with the degree program, the Dean of Graduate Studies is responsible for ensuring the quality of the admission of students to the doctoral, master's, diploma and certificate programs of the University. Admission is based on an assessment of the student's qualifications for the proposed program of study and entails specific credit, residence, course, thesis, and examination requirements, which vary from program to program.

The Application Process

Applicants to graduate programs should apply online; more information is available on the Graduate Studies website.

Applicants may apply as full-time or part-time students; refer to Student Classification for more information.

Admission Application Deadlines

Admission Application Deadlines vary depending on the degree program. Applicants should contact the degree program to which they are applying for specific admission deadlines. Applicants should arrange for all required documentation to be in the appropriate office by the deadline. Please note that many programs only admit new students for the term which begins in September.

New students (applying for admission to a Master's or Doctoral program) are now automatically considered for all Entrance Awards; there is no separate application process. Refer to Awards page for further information.

Graduate Application Fee

There is a $100 (Canadian) application fee per application. The fee is payable on-line by Visa, MasterCard, or international Wire Transfer. This application fee is not refundable under any circumstances, nor can it be used towards tuition. It is not transferable to a session other than that for which the student is applying.

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Admission Requirements

Applicants to Concordia University must meet the minimum university requirements to be considered for admission. Some degree programs may have additional or stricter requirements. These requirements are detailed in the degree program's calendar section and applicants should review this information. The minimum requirements to be considered for admission to graduate studies at Concordia are listed below.

International applicants may refer to the Graduate International Admission Qualifications table for equivalent qualifications from different countries.

Academic Requirements

To be considered for admission to Doctoral-level studies, the applicant must have completed a master's/magisteriate degree (or equivalent) with high standing.

To be considered for admission to Master-level studies, the applicant must have a bachelor's/baccalaureate degree (or equivalent) with high standing (e.g., with honours, or the Concordia equivalent of a GPA of at least 3.00 on a scale of 4.30).

To be considered for admission to most graduate diploma or graduate certificate-level studies, the applicant must have completed a bachelor's/baccalaureate degree (or equivalent) with the Concordia equivalent of at GPA of at least 2.70 on a scale of 4.30.

Some degree programs may have additional, or higher, academic requirements. Applicants should review the Calendar program section of the degree program in which they are interested.

TOEFL/IELTS Admission Requirements

International students whose first language is not English or French must submit test scores for either TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing System), unless their prior degrees are from a university whose language of instruction is English or French. The minimum acceptable score for the internet-based TOEFL (TOEFL iBT) is 80 and 550 for the paper-based TOEFL (TOEFL PBT) The minimum band score for IELTS is 6.5. TOEFL and IELTS scores are valid for up to 2 years after the test date.

Individual programs may require a higher minimum score for these two tests: applicants should check their prospective program's requirements.

Applicants whose prior degrees are not from a university whose language of instruction is English or French may be required to submit proof of English proficiency.

CELDT Admission Requirement *

Graduate Program Directors may require applicants to write the Concordia English Language Diagnostic Test (CELDT) as a condition of admission. Depending on the result, students may be required to complete English language courses in addition to their program requirements.

Citizenship or Permanent Residency Documents

Canadian citizens and Permanent Residents (Landed Immigrants) must provide proof of their citizenship status in Canada as part of their application for admission. Students who have not provided such evidence are automatically charged international tuition rates. To prove Canadian citizenship or Permanent Resident status, applicants must submit a legible copy of one of the following documents:

- Canadian birth certificate;

- Quebec Birth Certificate issued by the Quebec Directeur de l'état civil with the mention "Certified" or "certifié conforme"
- Canadian Citizenship Card (both sides);
- Canadian Citizenship Certificate;
- Permanent Resident Card (both sides) or IMM 5292 or IMM 5688;
- Certificate of Indian status card.

Refer to the Office of the Registrar website for information on students who may be exempted from the International tuition rates.

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Proof of Québec Residency

Québec residents must provide proof of their provincial residency status upon receiving admission to Concordia University. Students who have not provided such evidence are automatically charged non-Québec residency tuition rates. Information on provincial residency status can be found on the Office of the Registrar website

Exemption to non-Québec Resident Tuition Rate

All PhD programs are exempt from paying the non-Québec resident tuition rate. In addition, students enrolled in the Master of/Magisteriate in Business Administration privatized program (International Aviation Option or Executive Option) and the Investment Management programs are exempt from paying the non-Québec resident fee.

However, all courses completed outside these programs are subject to the non-Québec resident fee.

Students who are enrolled in certain French programs may be eligible for the French program Fee Exemption

Permanent Code

The ministère de l'Éducation, du Loisir et du Sport (MELS) requires all registered students to have a "permanent code" (a unique identifying number) which is assigned by MELS.

Applicants who do not provide a valid code with their application must apply for one upon receiving admission to Concordia University. Information on how to apply for a permanent code and a link to the on-line "Permanent Code Data Form" can be found at the Permanent Code website

Students who do not submit or apply for a permanent code will be charged a permanent code surcharge

Prerequisite Courses

Applicants who are deficient in certain courses may be required to take prerequisite courses either as an Independent student or as a student in a Qualifying Program. Refer to Independent Students and Qualifying Programs

Students taking prerequisite courses are charged tuition and other fees on a per credit basis for these courses. See Tuition & Fees

Transfer Credits and Exemptions

Student may be entitled to transfer credit from previous studies to their new program and/or be exempted from certain courses. Refer to Transfer Credits and Exemptions for additional information.

Qualifying Program

Depending on the degree program and on the number of courses required, prerequisite courses taken in a Qualifying Program may be taken prior to admission into a graduate program or concurrently with the graduate program.

Qualifying Program (prior to admission to a graduate program): Applicants who have completed an undergraduate program leading to a bachelor's degree, but whose preparation is inadequate for direct admission to a graduate program, may, upon recommendation by a department, be permitted to register for a Qualifying Program of advanced undergraduate or graduate studies. Students admitted to a Qualifying Program take undergraduate or graduate courses as preparation for application to a graduate program.

- The minimum qualifications for entry into the Qualifying Program are as follows: at least 24 course credits in the proposed field of study as determined by the program; at least a *B* average in these courses (*B-* for Diploma and Graduate Certificate courses), with no grade lower than *C*; and at least a *C* average in their final two undergraduate years.
- Qualifying Programs consist normally of four or five senior undergraduate courses. In certain exceptional cases, students may be required to take more than this number, and spend more than one full year as qualifying students.
- Qualifying students must have their program of study approved by the relevant Graduate Program Director prior to each registration period.
- **Satisfactory completion of the courses taken in a Qualifying Program does not guarantee automatic admission to a graduate program.** Students must apply, or reapply, for admission to graduate studies during or after the Qualifying Program. Their applications are considered along

with all other applications received at that time, and do not take priority over those of other applicants who may be better qualified.

- Students taking prerequisite courses are charged tuition and other fees on a per credit basis. See Tuition & Fees

Qualifying Program (concurrent): Students admitted to a graduate program and a concurrent Qualifying Program are required to complete prerequisite courses at the same time as they complete their Graduate Program requirements. The Qualifying Program normally does not exceed 12 credits but may consist of graduate and/or undergraduate courses.

- The prerequisite courses are completed in addition to the regular graduate program and form part of the student's degree requirements for graduation.
- The prerequisite course(s) must be completed during the first year of study in the graduate program.
- The student must maintain a minimum grade of *B* in each prerequisite course to maintain acceptable academic standing.
- Qualifying students must have their program of study approved by the relevant Graduate Program Director prior to each registration period.
- Students are charged tuition and other fees for the prerequisite courses in addition to fees charged for the student's graduate program of study. See Tuition & Fees

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Deferment of Admission

Applicants who have been accepted to a degree program and who wish to postpone the start of their studies may request a deferral of admission. These students should contact their degree program in order to request permission for a change of admission date. In cases where a program approves a deferment of admission, there is a $25 fee. The deferral form can be found in the Forms for Students section. The completed form along with the deferral fee, should be submitted to the applicant's degree program.

Accelerated Admission to PhD Programs

Accelerated admission (fast-tracking) describes a process whereby exceptional students are admitted to PhD programs without a master's/magisteriate degree in the same discipline.

Students who follow this process must show high academic performance or potential, evidenced by an outstanding GPA, appropriate research publications in the field of study, a research topic at the

master's/magisteriate level which is advanced enough for a doctoral thesis proposal, or other similar demonstrations of achievement.

Students who are accepted for accelerated admission and who are currently registered in a master's/magisteriate degree program, or who would do so directly from a bachelor's degree, are expected to complete the course component of the thesis option master's/magisteriate in the same discipline in addition to the standard academic requirements for the doctoral program.

Internal Transfer

Students currently in a degree program may choose to transfer from one program to another (e.g. from a Master of Arts in Judaic Studies to a Master of Arts in Philosophy, or from a Master of Engineering in Mechanical Engineering to a Master of Applied Science in Mechanical Engineering).

A request to transfer from one degree program to another is considered to be a new application. Students who wish to transfer degree programs must submit an on-line application, along with the required application fee. Documentation showing professional and educational achievements outside of Concordia must be submitted if they have not already been provided.

Re-Admission of Withdrawn Students

Students who have been withdrawn from a graduate program for academic reasons (e.g. low GPA, C or F grades) may wish to be considered for re-admission into the program. Normally, students must have been withdrawn from the program for a minimum of five terms in order to be reconsidered. A request for re-admission is considered to be a new application. Students who wish to be considered for re-admission must submit an on-line application, along with the required application fee. Documentation (e.g. CV, transcripts) showing professional or educational accomplishments since the student was withdrawn must be submitted along with a recommendation for re-admission by the degree program.

Re-Instatement of Withdrawn Students

Students who have chosen to withdraw or been withdrawn from a graduate program for non-academic reasons (e.g. non-continuous registration) may wish to submit a Student Request form requesting re-instatement to the program. Refer to the Classification and Registration for more information.

Classification of Students and Registration

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Classification of Students

Independent Students

Applicants who do not have the minimum qualifications for direct admission into a degree program may request to take courses as an independent graduate student. Likewise, graduate students who are enrolled in degree programs but who wish to take courses outside their degree requirements may request to take undergraduate courses as independent undergraduate students or graduate-level courses as independent graduate students

Independent graduate students enroll in a particular graduate course, without being admitted to the degree program which offers the course.

Normally, independent graduate students take no more than the equivalent of two graduate courses per term, and no more than the equivalent of four graduate courses from the courses of any graduate degree program up to 12 credits.

Only applicants who have the qualifications for admission to the course in question will be given permission to take the course. In every case, permission of the Graduate Program Director and/or Faculty Student Affairs Office must be obtained. Meeting the minimum requirements of an individual course does not guarantee entry to that course, as preference will be given to degree program students.

Independent Graduate Students are subject to the fees and regulations applicable to such categories of students.

Credits earned by independent graduate students may be considered for transfer credit in the event that the students are subsequently admitted to a graduate degree program. Please note that financial credit will not be awarded however.

Normally, an independent graduate student who receives an *F* grade is no longer allowed to continue studies.

Graduate independent students are eligible to audit courses. Refer to the section on Auditing Students

Visiting Students

Graduate visiting students are graduate students from other universities who have been authorized by their home universities to take graduate courses at Concordia University. They are subject to the regulations of Concordia University.

Graduate students from other Québec universities must submit requests for courses through the Inter-University Agreement (INTU/CREPUQ) process.

Graduate students from Canadian universities outside of Québec must complete the Graduate Transfer Agreement between Canadian Universities (CAGS) form or obtain a letter (or form) of authorization from their home university. This document must be submitted to the degree program offering the course in which they are interested.

Graduate students from universities outside of Canada must contact Concordia International if their home university has an exchange agreement with Concordia. They will be considered as Visiting Exchange students. If no exchange agreement exists, the student must obtain a letter of permission from their home university stating which courses they are permitted to take. The students must also provide information on their home university, official transcripts and immigration documents.

Auditing Students

Auditing students are graduate students who, with the permission of the Graduate Program Director and/or Faculty Student Affairs Office of the program in which the course is offered, may attend a class that is not a requirement of the student's program. There is no credit value assigned when courses are audited and students are not required to complete assignments or write examinations. Refer to Tuition and Fees for detailed information on the financial implications.

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Student Classification: Full/Part-Time Status

Graduate Certificate and Diploma Programs
Students in a graduate certificate or diploma program are considered to be full-time students if they register for 8 or more credits in one term, 16 or more credits over two terms, or 24 or more credits over three terms.

Students who do not fall in the situations as describe above, are considered to be part-time students.

Master's and Doctoral Programs
Students in master's or doctoral degree programs are accepted as full or part-time students at the time of admission. These students are considered to be full or part-time according to their status at admission, regardless of the actual amount of credits for which they register. Their classification will change only if they submit a request to change their status.

Independent Graduate and Visiting Students are considered to be part-time students.

Visiting Exchange Students are considered to be full-time students.

Changes to Student Classification: Full/Part-Time Status

Changes to student classification (from full-time to part-time or vice-versa) requests must be submitted prior to the DNE deadline of a given term. Students must see the Graduate Program Director in their program in order to initiate a Student Request. A change of student classification may have implications for students receiving loans or bursaries; students should check the regulations associated with their loans or bursaries. Changes to a student's classification may also affect the student's time limit and/or their payment schedule.

Registration

Registration for a Course or Courses

Programs register their graduate students for their course(s), within the dates scheduled for registration. A limited number of programs offer web registration. Students in programs that offer web registration are responsible for registering and withdrawing from their courses. All students should verify on their portal that their registration has been processed and that the course registration appears on their student record. Any errors or omissions must be addressed prior to the registration deadlines. If not officially registered in a course, students are not entitled to attend the course or to receive grades for any completed work. Refer to the Academic Calendar for a detailed list of deadline dates.

Late registration for a Course or Courses

Students who could not register by the registration deadlines must see the Graduate Program Director in their program in order to initiate a Student Request to late register a course(s). Late registration is allowed only in special circumstances, with the approval of the Graduate Program Director and the Dean of Graduate Studies. Student requests for late registrations must be supported by appropriate documentation.

Students may attend classes until they receive a decision from the School of Graduate Studies. If the decision is negative, the student must stop attending classes. Please note that late registration is granted only in exceptional circumstances when the late registration is determined to have been no fault of the student.

Students will incur a late registration fee when they register on, or after, the date that classes officially begin across the University.

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Withdrawal from a Course or Courses

Students who wish to withdraw from a course(s) must contact their Graduate Program Director in writing prior to the DNE/DISC deadline (e.g. email). Withdrawing from a course leads to either a Did Not Enter (DNE) or a Discontinued (DISC) notation.

It is the student's responsibility to meet all deadlines and follow all necessary steps to withdraw from a course(s), or from the University. Not attending classes or informing an instructor of the intent to withdraw does not constitute official withdrawal. It is not mandatory for an instructor to provide students with any evaluation or feedback of their progress in a course before the withdrawal deadline. Students who do not properly withdraw before the published deadlines will receive failing grades.

Did Not Enter (DNE)

A DNE means that the student has officially withdrawn from the course. The DNE'd course(s) will be removed from the student's academic record, and will not appear on the record. Refer to Tuition and Fees for detailed information on the financial implications and the Academic Calendar for deadline dates. Non-standard DNE dates are available through the Graduate program office.

Discontinued (DISC)

A DISC is an academic withdrawal from a course. This means that the student is still registered in the course, but no longer has to attend classes or complete the course work. The student will not be academically penalized (i.e. receive a failed grade). A DISC notation is permanent and appears on the student transcript next to the relevant course. Failure to comply with the DISC withdrawal deadline results in the course(s) in question being graded *Fail*, *F*, or *Fail/Absent (F-ABS)*. Refer to F rule for academic standing.

Withdrawal from Program or from the University

Students who wish to withdraw from their program or from the University must do so by the DNE deadline and include the reason(s) for withdrawing. A "Notice of Withdrawal from Graduate Program" form must be completed and submitted to the student's Graduate Program Director. If the withdrawal is initiated before the DNE deadline, the course(s) will be removed from the student's academic record, and will not appear. If the withdrawal is after the DNE deadline, it will be processed at the end of the current term and courses on record will be discontinued (DISC), if submitted prior to the academic withdrawal deadline. Failure to comply with the DNE withdrawal deadline results in the course(s) in question being graded *Fail/F/Fail/Absent (F-ABS)*.

Refer to Tuition and Fees for detailed information on the financial implications.

Continuing In Program (CIP) Registrations

(for students in master's or doctoral programs)

After a student's first registration has been processed, the registration system will consider master and doctoral students to be continuing in their program when they are not otherwise registered in academic courses. Students who are still within their program time limit but are not registered in course credits, will be identified as "Continuing in Program" on their student record (CIP 001/1, 001/2 or 001/4). This notation is an academic notation and not a registration for academic credit. Students with a CIP notation will be charged either tuition or a Continuation fee. Refer to the Tuition and Fees for detailed information on the financial implications.

Students who are not registered for courses in the first term of admission must get approval from the School of Graduate Studies for a CIP notation. Students must see the Graduate Program Director in their program in order to initiate a Student Request.

The notation on the student record will show Continuing in Program (CIP) or Time Limit Extension (TLE), respectively, unless replaced by a course registration. The CIP is an automatic process. Should a student subsequently register for courses, the automatic CIP will be removed.

Automatic CIPs will occur for returning students only if there are no restrictions on record (e.g. academic, financial, expired time limits). Students will be withdrawn from their program if the automatic CIPs cannot be processed each term.

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Withdrawal due to Lack of Registration

Graduate students in Master's and Doctoral programs will be withdrawn from their program if course registration or academic course notation (CIP/TLE) cannot be processed each term due to any outstanding admission, immigration documents, unpaid accounts or poor academic standing.

Graduate students in Diploma and Graduate Certificate programs will be withdrawn once their time limit has expired.

Refer to the sections on Continuing in Program (CIP) Registrations as well as Re-Instatement of Withdrawn Students

Lapsed Student Status

Independent graduate students and graduate visiting students who have not registered for courses for three consecutive terms or more will have their student status lapsed and must submit a new application for permission to register as an independent or visiting student

Time Limit Extension Registrations

Students who have exceeded their time limit and have been granted a limit extension will automatically be registered in "Time Limit Extension" (TLE) by the system until they have reached their program time limit extension. If a course is registered, the TLE notation is replaced with the course. Refer to Tuition and Fees for detailed information on the financial implications.

Inter-University Agreement (INTU/CREPUQ)

Québec universities have agreed to permit the transfer of academic credits between them using the CREPUQ/INTU Registration system. Using this system, Concordia students may take courses at another Québec University (the host university) and the credits will be transferred back to Concordia to be used to meet the requirements of their degree.

Up to a maximum of 6 credits may be transferred in any one year. In exceptional cases, a student may be authorized to take up to 12 credits at another university.

The host university has the right to accept or refuse a request for registration from a student in another university, in any of the courses or programs which it offers. Students are subject to the rules and regulations of the host university.

Eligible students

Only students enrolled in a degree program are eligible to register under the Inter-University Agreement. Authorization for a Concordia graduate student to register at another university must be given by the student's Graduate Program Director, the Dean of Graduate Studies, and the Office of the Registrar. Only students in good academic standing will be approved to register under the Inter-University Agreement. In addition, in order for students to be approved, their admission file must be complete and finalized. Concordia students wishing to take a course at another university cannot have an outstanding account balance.

Eligible Courses

The agreement normally covers only graduate degree students and graduate-level courses, and is intended to include only those courses not given at the home university which fit a student's program requirements. In exceptional cases, graduate students may be authorized to take undergraduate courses to meet the requirements of a concurrent qualifying program.

Transfer of Grades

The grades achieved at other institutions for courses taken under the Inter-University Agreement will be recorded on Concordia records and transcripts using a conversion table. These grades will be included in the calculation of grade point averages in the same manner as any grade achieved in a course taken at Concordia and subsequently transferred into the student's program.

Payment of Courses

Payment for the courses is due at the student's home university. Refer to the Financial Regulations section in the Calendar. Any additional costs (i.e. lab materials) are payable to the host university.

Registration/Cancellation of Courses

All requests for registration and/or cancellation of courses are done through the CREPUQ website. Students are responsible for accessing the CREPUQ website to check the status of their request on a regular basis. Requests go though several stages of processing and e-mails will not necessarily be sent to update the student on the status at each stage.

Deadlines

Requests for registration or cancellation of courses at other universities must be submitted by the deadline of the host university. Students are advised to inform themselves of the host university's deadlines, since they may be different from Concordia's.

Students should refer to the CREPUQ website for detailed information.

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Deadline Dates

Refer to the Academic Calendar for a detailed list of deadline dates. These deadlines shall apply for all courses taken by graduate students in their graduate program or as independent or visiting graduate students.

Financial Implications

Refer to Tuition and Fees for detailed information on the financial implications related to late registration, DNEs, DISCs Continuation fees or TLEs.

Student Portal (www.MyConcordia.ca)

Students can access information concerning their personal class schedule, current course grades, account balance, tuition and enrolment receipts for educational tax credit, loans and bursaries, personal book list, permanent code status and registration dates on their student portal. Students can also update their mailing address(es) and e-mail address(es) on the student portal; students are responsible for ensuring that the contact details listed are current.

Tuition and other fees are automatically assessed and charged to the student's account once a student has registered in a course(s) or has a Continuing in Program (CIP) or a Time Limit Extension (TLE) academic notation on their student record. The student's account balance is available on the student portal. Refer to Tuition and Fees for detailed information.

Within Minimum Residence

All master's and doctoral programs have a minimum residence requirement of at least three terms for master's degrees and six terms for doctoral degrees. This is the minimum period of time which must elapse between a student's initial registration in the program and the student's graduation. There is no minimum residence requirement for diploma and certificate programs.

Leaves of Absence from Program

Graduate students who wish to temporarily discontinue their studies for a few terms may request a leave of absence from their program. Before requesting a leave, students should confirm with their Graduate Program Director and supervisor that all required components of their degree programs will be available when they return. The beginning and end of a leave should coincide with the beginning and end of an academic term.

Leaves are granted only to students in good academic standing. Refer to the relevant Academic Regulations section in.

Students cannot be on Leave in terms where a course with a DISC notation appears since a DISC'd course is still considered as a registration. Refer to the Withdrawal from a course or courses section.

No changes to the student's academic status will be made during a leave.

Time Limit & Other Deadlines

While on leave, the student's program time limit will be extended by the period of the leave. All deadlines for work in progress will be extended by the period of the leave.

Access to University Services

During a leave of absence (of any type), students are not entitled to take courses, write exams, submit outstanding work and/or request guidance on thesis and research work. However, they may have access to some university services depending on the type of leave they request. There are three types of leaves available to students:

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Types of Leaves & Fees

Leave without access: During a leave without access, a student will not have access to library, university or student services. No fees are charged.

Leave with access: During a leave with access, a student will have access to library, university and student services. Leaves with access are granted only under exceptional circumstances. A flat service fee of $150 per term will be charged.

Parental leave: All graduate students are entitled to parental leave of up to three consecutive terms during their program of study on the occasion of the birth or adoption of a child. The student will have access to library, university and student services. Students holding a Concordia Fellowship will receive a deferral of their fellowship for the period of leave. In the case of other fellowships, the regulations of the granting agencies will apply. No fees will be charged.

Except for Parental leave, students are normally permitted only a maximum of three terms of leave (with or without access) during their program of study. Leaves beyond three terms are only approved on an exceptional basis and with supporting documentation. Parental leave can be requested on the occasion of each birth or adoption of a child.

Awards, Loans, Bursaries

A leave from a program of study may have implications for students receiving awards, loans or bursaries; students should check the regulations associated with their awards, loans or bursaries.

Medical Coverage

- While on an approved leave of absence Canadian students do not pay fees for the Student Health and Dental Plan. Therefore, they are not covered by (insured under) this insurance plan.
- While on an approved leave of absence international students do not pay fees for the Concordia Health Insurance Plan. Therefore, they are not covered by (insured under) this health insurance plan. In addition, since the visa status of international students may possibly be affected by a leave

of absence, it is very important that these students visit the International Students Office for additional information.

Applying For a Leave

Students apply in advance through the Student Request Process, prior to the DNE deadline. Students must see the Graduate Program Director in their program in order to initiate a Student Request. Students must specify the reason for the Leave and provide supporting documentation; for example, a request for leave for medical reasons must be supported by an original medical certificate.

End of a Leave

Once a student's leave is over, the student will be considered as continuing in their program. Students in master's and doctoral programs will receive a Continuation in Program notation on their record and be charged accordingly. Diploma and Certificate students will only be charged once they register for courses.

Student Requests

Applications from full-time or part-time students for exceptions to academic regulations or related matters should be submitted by the student's program using the Student Request system. Students must see the Graduate Program Director in their program in order to initiate a Student Request. A statement from the student confirming support for the request submitted with relevant supporting documentation and a recommendation from the Graduate Program Director should be included with the request and sent to the School of Graduate Studies for approval. A request is not deemed to be approved until authorized by the School of Graduate Studies.

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Exemptions

Depending on the policy of the degree program, students may be granted an exemption from a required course in their program curriculum. Students who are granted an exemption must replace the exempted course with another course in order to fulfill the credit requirements of the program. This replacement course must be selected in conjunction with their Graduate Program Director.

Students who have been granted an exemption for a course cannot subsequently take that course for credit toward the graduate certificate, diploma or degree.

Transfer Credits

Students may transfer credits from previous studies to their current program. The credits must have been earned for graduate-level studies and they must not have been used as part of a completed degree.

Requests to transfer credits must be approved by the students' degree program and the Dean of Graduate Studies. Transfer credits must normally be requested in the student's first term of admission.

The number of transfer credits allowed will not normally exceed one-third of the total credit requirements of the program to which the credits are being transferred. However, some degree programs may allow fewer transfer credits. Students are encouraged to read their program's calendar section for further information.

As part of a request to transfer credit, students must provide official transcripts showing that they have completed the course. The grade and number of credits they received for the course must appear on the transcript. The transcripts must be accompanied by official course descriptions for the relevant courses. In addition, the transcripts must show that the students have withdrawn from the program from which the requested credits are being transferred.

Transfer credits to programs requiring a minimum admission GPA of 3.00 will be permitted only if the final grade for the course is *B* or better. Transfer credits to programs requiring a minimum admission GPA of 2.70 will be permitted only if the final grade for the course is *B-* or better.

The grades associated with transfer credits do not appear on the students' transcript and therefore will not affect their Grade Point Average. The two exceptions to this rule are credits transferred from previous studies at Concordia University and credits for courses taken under the Inter-University Agreement (INTU/CREPUQ).

Courses taken previously at Concordia and courses taken under the Inter-University Agreement will appear on Concordia records and transcripts, under the new program, along with the grades associated with the courses. The transferred grades and credits will be included in the calculation of students' grade point averages.

The grades for INTU courses will be recorded using a conversion table that can be accessed at the Registrar's website

Re-Instatement of Withdrawn Students

Students who have been withdrawn from a graduate program by the University for non-academic reasons (e.g. non-continuous registration) may wish to submit a Student Request form requesting reinstatement to the program. Students must see the Graduate Program Director in their program in order to initiate a Student Request. This request is to be submitted for consideration during the same term in which the student was withdrawn.

Students who withdrew from their program for non-academic reasons, and who are still in good academic standing according to the regulations of the university may request to be reinstated into their program. The request for reinstatement must be for an academic term no later than one year (3 academic terms) after the term of withdrawal.

Thesis Regulations

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Thesis

A thesis is the final report on a comprehensive research program that meets accepted scholarly criteria and is of a cohesive, unitary character. All written components of a thesis must meet the scholarly requirements of the research discipline and be formatted in accordance with the Thesis Preparation and Thesis Examination Regulations.

If it is necessary to include non-text materials in a thesis, the content must conform to standard usage in the student's field of research, and be in a format that allows for submission via Spectrum: Concordia University's Research Repository.

The student's supervisor shall fully inform the student of any and all contractual obligation(s), as they may pertain to the student, which may affect the public defence and/or publication of his/her thesis.

Thesis Submission

In order to meet a particular graduation date, a student must submit his/her thesis to the Thesis Office at any time before the specified deadline set out in the Academic Calendar. It should be noted that some programs have established deadlines earlier than those of the Thesis Office. The initial submission of the thesis to the Thesis Office begins the official examination process.

A thesis submitted to the Thesis Office must be ready for formal evaluation according to requirements set out in the Thesis Preparation and Thesis Examination Regulations. Any deviations from the stated requirements must have prior written approval of the Dean of Graduate Studies.

The student's supervisor shall review the thesis before the initial formal submission to the Thesis Office. In the event that the student and supervisor cannot reach an agreement on the readiness of the thesis for submission, the Graduate Program Director and the Dean of Graduate Studies may be required to arbitrate. Although it is not recommended, the student has the right to defend his/her thesis without the supervisor's approval.

Thesis Not Written in English

At Concordia, theses are normally written in English. However, a student who intends to submit his/her thesis in French must inform his/her supervisor when submitting the thesis topic for the supervisor's approval. In the event that a student wishes to submit his/her thesis in a language other than English or French, where the program does not have prior approval, the thesis supervisor must make such a recommendation, with an appropriate justification, to the Graduate Studies Committee when the student's thesis topic is submitted for approval. The decision of the Graduate Studies Committee on such a recommendation shall be communicated to the Thesis Office. A thesis written in a language other than English or French must include a comprehensive summary of its contents. This comprehensive summary must be written in English or French, appear after the abstract and must be approximately 20 pages and examined as part of the thesis.

Joint Programs

The PhD programs in Administration, Art History, Communication, and Religion must adhere to the thesis requirements and guidelines at Concordia.

According to the signed agreement(s) as detailed in the Thesis Preparation and Thesis Examination Regulations, students in the co-tutelle and Algant programs must satisfy the thesis requirements/guidelines of both universities.

Examination of Thesis

Doctoral Thesis

The doctoral thesis examination is the culmination of the student's program. It exposes his/her research and thesis to scholarly criticism and gives the student the opportunity to defend it. The thesis defence is an oral examination conducted by the Chair of the Examining Committee who shall be the Dean of Graduate Studies

or his/her delegate. Any member of the University can attend a doctoral defence. Contractual and/or legal obligations may necessitate that all participants to a thesis defence sign an undertaking of confidentiality.

The Examining Committee consists of at least five (5) members. At least one (1) must be from outside the student's department but from within the University (external-to-program examiner) and one (1) from outside the University (external examiner). In programs where there is a Thesis Supervisory Committee, any or all members of this committee may be named as members of the Examining Committee, subject to the practices of the relevant program. The student's supervisor(s) must be a member of the Examining Committee. Co-author(s) of work included in the thesis cannot serve as an examiner for that thesis except for the supervisor(s).

The student's program is responsible for ensuring that the proposed date of the thesis defence is agreeable to all members of the Examining Committee prior to submitting the Doctoral Thesis Examination Committee Form. The thesis and the approved Doctoral Thesis Examination Committee Form must be submitted to the Thesis Office no later than six (6) weeks (eight (8) weeks for Engineering) prior to the expected date of the defence. A copy of a thesis remains with the School of Graduate Studies, where it is made available for examination by any member of the University. Contractual and/or legal obligations may necessitate that all participants to a thesis defence sign an undertaking of confidentiality.

Questions on a thesis by members of the University, other than those on the Examining Committee, must be submitted in writing to the Dean of Graduate Studies no later than seven (7) days prior to the date of the thesis defence.

The relevant Graduate Studies Committee renders a decision on whether the student has fulfilled the requirements of the doctoral degree based on the Examining Committee Report and its own records of the student's progress in his/her assigned program of study. Where the relevant Graduate Studies Committee has assessed that the student has fulfilled the requirements of the doctoral degree, it shall request that the Dean of Graduate Studies recommends to the Council of the School of Graduate Studies that the doctoral degree be awarded. The Council of the School of Graduate Studies shall make a recommendation to Senate for the awarding of the doctoral degree. Once such a recommendation has been passed by Senate, the electronic version of the thesis may be made available to the public via Spectrum: Concordia University's Research Repository.

At any time, the Dean of Graduate Studies may bring before the Council of the School of Graduate Studies any matter that may affect the acceptance of the thesis or the award of the doctoral degree.

Procedures related to presentation, question period and deliberations of the defence can be found in the Thesis Preparation and Thesis Examination Regulations

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Master's Thesis

The Graduate Studies Committee of the student's program, in consultation with his/her supervisor, appoints an Examining Committee. The Examining Committee consists of a minimum of three (3) and a maximum of five (5) members. The student's supervisor(s) must be a member of the Examining Committee. Students in the Individualized Program must have one (1) external member from outside the university on their Examining Committee. Co-author(s) of work included in the thesis cannot serve as an examiner for that thesis except for the supervisor(s). The Examining Committee for students in the Master in Applied Science (MASc) programs in Engineering must have one (1) University member that is external to the student's program or department.

Unless otherwise agreed, the defence is generally scheduled by the student's program within two (2) to five (5) weeks from the initial submission of the thesis depending on the program's regulations.

The defence is normally an oral examination conducted by an Examining Committee and chaired by an individual who shall be appointed by the Graduate Studies Committee. Prior to the date of the defence, each member of the Examining Committee must submit the completed Examiner's Evaluation of a Master's Thesis to the Chair. Any member of the University can attend a master's defence. Contractual and/or legal obligations may necessitate that all participants to a thesis defence sign an undertaking of confidentiality.

Procedures related to presentation, question period and deliberations of the defence can be found in the Thesis Preparation and Thesis Examination Regulations

Decision

The decision of the Examining Committee is based both on the thesis and on the student's ability to defend it. At the PhD defence, an Oral Presentation Form must be completed and signed by the Chair. It is the responsibility of the Chair of the Examining Committee to ensure that an Examining Committee Report is prepared and signed by all members of the Examining Committee before this Committee adjourns. The Examining Committee Report must include the written reports of absent and dissenting Examining Committee members. It is the responsibility of the Chair of the Examining Committee to report to the Dean of Graduate Studies on the conduct of the examination.

The Examining Committee can render one (1) of four (4) decisions, subject to a vote of majority. Members of the examining committee may not abstain from voting. The thesis can be:

- accepted as submitted which may include editorial or formatting corrections;

- accepted with minor modifications defined as corrections which can be made immediately and to the satisfaction of the supervisor;
- accepted with major modifications: the Examining Committee Report shall include a precise description of the modifications along with a date for their completion of no more than six months. The Examining Committee shall examine the modified thesis and by majority vote determine if the modifications specified in the Examining Committee Report have been completed to the Examining Committee's satisfaction. If they have, the thesis may be accepted and the supervisor will confirm the Examining Committee's approval to the Thesis Office. It is not necessary for the Examining Committee to reconvene. If the Examining Committee is not satisfied that the specified modifications have been made, then the Examining Committee must reconvene to decide if the thesis is rejected or an additional period of modifications is to be granted. The Chair shall report in writing to the Dean of Graduate Studies the outcome of the Examining Committee meeting; or
- rejected: such a thesis may be re-submitted only once, in revised form; such a re-submission can only be made six (6) months or more from the date of the Examining Committee report. Formal re-submission of a thesis follows the same procedure as an initial submission.

If the Examining Committee is unable to reach a decision concerning the thesis at the time of the defence, it is the responsibility of its Chair to determine what is required by the Examining Committee to reach a decision; make the necessary arrangements to fulfill any requirements of the Examining Committee; and promptly call another meeting and inform the student that the Examining Committee's decision is pending. The student is not normally required to be present at the second meeting of the Examining Committee.

Final Submission of Thesis

The primary goal of Concordia University is the dissemination of knowledge. To achieve this goal, the university makes all theses available to the general public via Spectrum, the Library Repository. Spectrum is a widely indexed, searchable database and its contents are readily available to the public via the internet.

A student must submit the final version of the thesis electronically, using Spectrum. The final version of the thesis must include any required modifications requested by the Examining Committee and any revisions requested by the Thesis Office. The student is responsible for the final electronic submission of his/her thesis.

Upon final submission of his/her thesis, a student shall be deemed to have granted the University a non-exclusive, royalty-free license to reproduce, archive, preserve, conserve, communicate to the public by telecommunication or on the internet, loan, and distribute the thesis worldwide for non-commercial purposes, in any format. Please refer to the University's Policy on Intellectual Property.

Deferment

If there is a good reason for delaying public access to a thesis, an approved embargo may be placed on the publication of the thesis. The deferment is for up to two (2) years but under exceptional circumstances may be renewed. The abstract and bibliographic information is not embargoed and is therefore still available to the public. In the event of a deferment, it is understood that the University's license to communicate, loan and/or distribute shall only take effect as of the expiry of the deferment period. Please refer to the University's Policy on Intellectual Property

Copyright Regulations

Members of the Concordia community are users of copyrighted materials and, as such, are subject to copyright legislation. Compliance with the Copyright Act and the University's Policy on Copyright Compliance is a student's responsibility. Failure to comply with the Copyright Act is a violation of federal legislation and may result in legal repercussions and/or disciplinary or other action by the University. Beyond any legal responsibility, a student must consider his/her ethical obligations to respect intellectual property rights.

Applied Human Sciences

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Applied Human Sciences Website

Master of/Magisteriate in Arts (Human Systems Intervention)

Admission Requirements. Candidates must have the following:

- At least two years of full-time work experience. Preference will be shown toward applicants who have work experience that is directly related to their learning goals in the program.
- Completion of a bachelor's degree with a minimum *B* average or a cumulative grade point average of at least 3.00.
- Successful completion of a one week residential Basic Human Interaction Laboratory and have written documentation from laboratory staff that they have competency in interpersonal interaction and facilitation.
- A clearly delineated career intention concerning the development of intervention expertise for a particular domain of professional practice.
- Be capable of undertaking all core courses of the first year in the scheduled sequence of the program.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits. 42 credits will be in required coursework, including 15 credits of project work. The remaining 3 credits are to be completed within or outside the department. Courses that are taken to complete entrance requirements to the program may not be counted toward the program's 45 credits. In exceptional cases, students who produce evidence of successful performance (*B* grade or better) in compatible coursework at other institutions may be permitted transfer credit. A maximum of 9 credits in transfer courses will be permitted.
- **Residence.** The minimum residence is one year (3 terms) of full-time study. Following the first year and with permission of the AHSC Graduate Committee, a student may extend completion of the program to more than the normal period of two years. Students will not be permitted to exceed a maximum of five years for program completion.

- **Coursework.** The program is divided into two sections of coursework, with Year I establishing the prerequisites for Year II. In addition, students will have a minimum of 3 credits of elective coursework to complete their degree requirements.

  Year I provides students with fundamental understanding and frames of reference regarding learning and change processes of persons and groups, steps in the intervention process, ethical principles, and research methods. These fundamental understandings are then deepened through application in practice-based courses of Year II. The Master's Project is intended to promote an integration of concepts and practical experience.

  Year I constitutes the first phase of the program. Year II and the Elective Coursework is more individually-tailored, and constitutes the second and subsequent years, when necessary.

  YEAR I: Total of Required Credits: Year I =18 credits
  The following are required of all students in the first year of study; additional three (3) credits of electives may be added to this set of courses:

  AHSC 610 Group Process Intervention (3 credits)
  AHSC 620 Learning and Individual Change Processes (3 credits)
  AHSC 631 Research Methods (3 credits)
  AHSC 632 Planning Human Systems Intervention (3 credits)
  AHSC 660 Philosophy and Ethics of Intervention (3 credits)
  AHSC 670 Consultation Methods (3 credits)

  YEAR II: Total of Required Credits: Year II = 24 credits
  The following will normally be required of all students:

  AHSC 680 Facilitating Individual and Group Learning Processes (6 credits)
  AHSC 685 Coaching Interventions and Processes (3 credits)
  AHSC 698 Master's Project (15 credits)
  + 3 credits of elective coursework.

  Elective Coursework

  Required credits from Years I and II comprise 42 of the 45 credits in this MA program. Students must complete an additional 3 credits of coursework to satisfy degree requirements. These three credits of coursework may be taken in Year I or Year II.

  AHSC 675 Introduction to Open Systems Theory (3 credits)
  AHSC 681 Selected Topics (3 credits)

AHSC 682 Selected Topics (3 credits)
AHSC 695 Independent Study I (3 credits)
AHSC 696 Independent Study II (3 credits)
Optional Coursework in AHSC or other departments

- **Course substitution.** Students may be exempted from certain courses on the basis of course work completed prior to entry into the program. A maximum of 9 credits of transfer credits will be permitted. These credits will be counted toward the required 45 credits in the program.
- **Residential Laboratories.** Students will be required to participate in two week-long residential laboratories for which expenses for accommodation, meals and program related fees will be the responsibility of the students.

Academic Regulations

- **Course Load for Full-Time Students.** The normal course load for full-time students will be a minimum of 18 credits per year. A student may not register for more than 27 credits per year without permission from the AHSC Graduate Program Director.
- **Course Load for Part-Time Students.** Students will only be admitted to the program on a full-time status for the first year. With explicit permission of the AHSC Graduate Committee, a student may continue on a part-time basis following the first year of study. Part-time status is defined as enroling in less than 8 credits per semester.
- **Academic Standing.** The scholastic performance of all MA students will be reviewed at the end of each academic year for full-time students. The assessment will be based on final grades of the courses completed during the year and assessments of field supervisors when students are involved in field placements. The purpose of this review will be to monitor students' status and progress, to maintain the standards of the program, and to assist students in achieving their personal objectives for the program.

  To be considered in good standing at such a review, students must have:
  - successfully completed the required course load specified in paragraphs 1 and 2 above;
  - achieved a grade point average (GPA) of 3.00 or better since the previous review or since admission in the case of a first review;
  - achieved a grade of no less than *B* in each academic course taken during the term of the review; and,
  - achieved a "pass" grade from supervisors in practicum assignments (Practicum courses will be graded "pass" or "fail").

  A student who has not fulfilled the requirements for good standing is considered either a **failed student** or a **student on conditional standing.**

- **Conditional Standing.** Students with no failures on their record who have met the conditions for good standing will be placed on conditional standing. Conditional standing is used to monitor the progress of students experiencing difficulty and to assist them to complete the program successfully.

  Students on conditional standing will be required to achieve a grade of *B* or better in each course taken during this period. Students on conditional standing are not normally permitted to drop any course. Additional requirements may be imposed in individual cases. Students who do not meet the requirements for conditional standing are considered failed students and will be withdrawn from the program.

- **Failure Regulation.** Students who fail one or more courses in the program or who do not meet the conditions of their conditional standing will be withdrawn from the program.
- **Time Limits.** The program will normally be completed in a two year period. Some students may wish to continue on a part-time basis following the first year. Permission to do so must be obtained in advance from the AHSC Graduate Committee. All degree requirements must, however, be completed within a five year period from the initiation of the program. Students will be dropped from the program if they have not met all degree requirements at the end of five calendar years from the initiation of their programs.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Core Courses

AHSC 610 Group Process Intervention (3 credits)
This course is oriented to the theory and practice of intervention in small groups. The course involves participation in a small group laboratory through which students' experiences are integrated with conceptual frameworks, including theories of group development and leadership. Ethical issues in group processes will be considered.

AHSC 620 Learning and Individual Change Processes (3 credits)
This course will examine research and theory of individual learning and change which involves cognitive, affective and behavioural components. Intervention with an emphasis on a normative re-educative approach to facilitating learning and change will be emphasized. Illustrative intervention cases will be examined to identify essential qualities, underlying assumptions about learning and change in the context of human systems, and implications for the role of the intervener.

AHSC 631 Research Methods (3 credits)
This course examines research methods involved in action research and other applied field perspectives.

Methods applicable at all stages of the research process include the literature review, defining the purpose of study, design of quantitative and qualitative research tools, data gathering, qualitative and quantitative data analysis, and reporting and communicating research results and recommendations.
Note: Students who have received credit for AHSC 630 may not take this course for credit.

AHSC 632 Planning Human Systems Intervention (3 credits)
This course examines the design and implementation of intervention programs from a systems perspective based on organizational theories, needs assessment, theories of learning and change, and group processes. It builds on basic concepts of organizational dynamics and effective human systems. Emphasis is on understanding organizational and group processes, development of planning skills, and making strategic choices. Interventions are framed in the context of collaborative action research with participant involvement at all stages including problem analysis and definition, generating and selection intervention strategies, action planning, implementation, and project evaluation.
Note: Students who have received credit for AHSC 630 may not take this course for credit.

AHSC 660 Philosophy and Ethics of Intervention (3 credits)
This course will review the philosophical underpinnings of intervention in human systems with an emphasis on a normative re-educative approach. It will address core values and ethics imbedded in change efforts, as well as examining the philosophical roots of different traditions of change methodology. It will consider the philosophical implications of change agents functioning as consultants rather than experts and as process rather than content specialists. It will consider ethical and philosophical aspects of power, strategy, and conflict, among other issues associated with intervention.

AHSC 670 Consultation Methods (3 credits)
The course will examine current models of consultation. It will enable students to establish effective client-consultant relationships based on collaborative approaches to entry, diagnosis, planning, and implementation. Ethical concerns for consultation will be integrated with discussions of methodology. Through observation and analysis of student-designed interventions, the course will provide experience-based learning and feedback. Special attention will be given to considerations of power, conflict, decision-making, negotiation, problem-solving, planning, and strategy.

AHSC 680 Facilitating Individual and Group Learning Processes (6 credits)
Prerequisite: Completion of Year I coursework (AHSC 610, 620, 631, 632, 660, 670).
This course will focus on interventions at the individual and group levels. Client-centred models of working in groups to achieve learning and task objectives will be reviewed. Issues of design, planning, and implementation of learning programs for individuals and groups, including attention to power, problem-solving, decision-making and conflict management will be examined in a laboratory setting where students will plan and conduct a group learning program under supervision.

AHSC 685 Coaching Interventions and Processes (3 credits)
This course develops professional understanding of theories and methodologies relevant to individual coaching processes in the functioning of groups, organizations and communities. Emphasis is placed on the development of competencies in executive, managerial and employee coaching. Course content encompasses phases of the coaching process, communication methodologies, obstacles and barriers to change, individual change models, strategic individual interventions, dealing with resistance, philosophy and ethics of coaching, and coaching structures. Practical components are integrated into the course.

Elective Courses

AHSC 675 Introduction to Open Systems Theory (3 credits)
This course introduces the socio-ecological version of open systems theory (OST) and practice with a particular focus on the Search Conference, the Participative Design Workshop, and Unique Designs. OST was developed to promote and create change toward a world that is consciously designed by people, and for people, living harmoniously within their ecological systems, both physical and social. Students learn how to design and implement interventions in organizations, communities and larger social systems.
Note: Students who have received credit for this course under an AHSC 681 number may not take this course for credit.

AHSC 681 Special Topics (3 credits)
Topical seminars will be offered to provide perspectives about current intervention themes. These may complement students' programs, but will not constitute part of the required curriculum. Examples include: emerging trends in organizational development; strategic planning models; the use of self as an instrument of change; intercultural issues in intervention; appreciative inquiry; complexity theory.

AHSC 682 Special Topics (6 credits)
Same as AHSC 681 when a second special topic is offered in the same term.

AHSC 695 Independent Study I (3 credits)
Students may pursue studies in areas of specialized professional interest related to the graduate program or as a means of strengthening understanding of the core areas of the graduate program.

AHSC 696 Independent Study II (3 credits)
Students may pursue a second area of specialized professional interest related to the graduate program or further develop understanding in the core areas of the graduate program.

Project

AHSC 698 Master's Project (15 credits)

Prerequisite: Completion of AHSC 680.

Students must demonstrate their ability to conduct a complete intervention to effect change in a human system as the principal consultant in a collaborative relationship with a client representing that system. The project includes contracting with the client, gathering and analyzing data, implementing relevant intervention activities, and evaluating the intervention as well as their role.

Biology

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Biology Website

Doctor of/Doctorate in Philosophy (Biology)
Master of/Magisteriate in Science (Biology)
Diploma in Biotechnology and Genomics

Doctor of/Doctorate in Philosophy (Biology)

Admission Requirements. Applicants should have an MSc degree in life sciences and will be assessed by the departmental Graduate Studies Committee on the basis of undergraduate and graduate grades, letters of reference and research ability. Applicants should have at least a *B* average overall. Prior to final acceptance, the student must have a thesis supervisor chosen by mutual agreement among the student, the Graduate Studies Committee and the potential supervisor. Students will normally be accepted only for full-time study. Students with a Master's degree from a foreign university will normally not be directly admitted into the PhD program, but will be accepted into the Master of/Magisteriate in Biology program. They will, however, on demonstration of the ability to complete a PhD, be eligible to transfer to a PhD as described below.

Students registered in the Master of/Magisteriate in Science in Biology who demonstrate exceptional potential for independent research and have attained an *A-* average in graduate courses in the program may request to transfer to the PhD program during the first six months of the second year of enrolment. The transfer must be approved by the student's supervisory committee and the departmental Graduate Studies Committee.

Requirements for the Degree

- **Credits.** A fully-qualified candidate entering the program with a master's degree is required to complete a minimum of 90 credits. Students transferring from the MSc program will be required to complete 90 credits in addition to the course requirements for the Master's program (9 credits). Students may be required to take up to 12 credits, at the graduate or advanced undergraduate level, in addition to the above. These courses may be required to strengthen understanding of peripheral areas or of the student's area of specialization. The additional course work may be

assigned as an admission requirement or following the Research Proposal and Qualifying Exam (BIOL 850).

- **Residence.** The minimum residence requirement is two years (6 terms) of full-time study beyond the master's degree, or three years (9 terms) of full-time study beyond the bachelor's degree.
- **Courses.** To graduate, students must meet the following requirements:
    - 3 credits from BIOL 616, BIOL 670, BIOL 671 or any of the Advanced Topics or Reading Courses listed at the end of the Biology calendar entry. Other courses in the list may be chosen upon recommendation of the supervisory committee and the Graduate Program Director.
    - BIOL 801: Pedagogical training (3 credits). Candidates are required to give four lectures (normally 75 minutes each) to undergraduate classes. Two lectures are in introductory level courses and two in advanced undergraduate courses. Tutorials are provided to introduce students to teaching methods. The course is marked on a pass/fail basis.
    - BIOL 802: Research seminar (3 credits). Students are required to give one seminar to the Department based upon their research project. Normally the seminar is given in the second or third years of residency. Seminars are graded on a standard scale (*A+* to *F*). The grade is based upon the presentation, content, and the student's ability to answer questions. The grade is assigned by the Graduate Program Director in consultation with the candidate's supervisory committee and other faculty members present at the seminar.
    - BIOL 850: Research proposal and qualifying exam (6 credits). The student prepares a written research proposal based upon the research topic chosen for thesis research. The proposal is prepared in consultation with the supervisory committee and contains a literature review, a progress report and a detailed description of future experiments. The proposal should demonstrate a good understanding of the background of the project, the questions to be answered, and the experimental approaches needed to answer these questions. Both the written proposal and an oral summary of the proposal are presented to the examining committee within one year of entry into the PhD program.
    - BIOL 890: Research and thesis (75 credits).
- **Research Proposal and Qualifying Exam.** The examining committee consists of the student's supervisory committee plus two additional members of the Department of Biology and is chaired by the Graduate Program Director. The student is evaluated on the basis of the quality of the oral and written presentations of the proposal and on responses to questions from the examining committee. These questions extend into general areas as well as focusing directly on the thesis topic. The examining committee assigns one of the following three grades:
    - PASS: The student is admitted to candidacy for a PhD in Biology.
    - CONDITIONAL PASS: The student is admitted to candidacy but is required to complete at least one additional course. This grade is assigned only if the background preparation of the student is judged to be insufficient.

- FAIL: The student must withdraw from the program.

If the examining committee judges that the proposal has weaknesses that can be corrected with minor revisions, it may suspend assigning a mark for a period not exceeding three months. The revised proposal then is assigned one of the three above grades.

- **Thesis.** A major portion of the PhD program involves the planning and execution of innovative and original research under the direction of a supervisor. It is expected that this research should result in publication in reputable journals, on which the candidate is the first author and the major contributor of ideas and experimental data. The thesis will be examined by a Thesis Examining Committee and will be defended orally.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 6 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students who receive more than one *C* grade during the course of their PhD studies will be required to withdraw from the program. Students may apply for re-admission. Students who receive another *C* after re-admission will be required to withdraw from the program and will not be considered for re-admission.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limits.** All work for the doctoral degree must be completed by the end of the fourth calendar year following the year of admission to candidacy, defined as successful completion of the Research Proposal and Qualifying Exam (BIOL 850).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of 3.00.

Master of/Magisteriate in Science (Biology)

Admission Requirements. The admission requirement is a BSc degree or equivalent with specialization in biology with good standing (*B* average) from a recognized university. Exceptionally, applicants not meeting the GPA requirement may be admitted on the basis of outstanding academic letters of reference, good performance and high standing in advanced courses or exceptional research experience.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study.
- **Courses.** Three 3-credit courses (9 credits), to be chosen in consultation with the candidate's advisory committee.
- **Thesis** (**BIOL 696**, 36 credits). The thesis will be examined by a committee composed of the student's supervisory committee plus a third examiner chosen at the discretion of the Graduate Program Director. An oral examination chaired by the Graduate Program Director or his/her designate will be conducted before the examining committee to test the student's ability to defend the thesis.
- **Seminars.** Each student is expected to attend and participate in departmental seminars. In addition, students will be required to present a short (20-30 minutes) seminar to the department on their research once during their residency, normally on completion of their first year.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 6 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **Progress Report.** Each student's progress is formally evaluated by the student's advisory committee every six months and a report is submitted to the Graduate Program Director.
- **C Rule.** Students who obtain less than a grade of *B-* in a course are required to repeat the course or take another course. Students receiving more than one *C* grade will be withdrawn from the program.
- **F Rule.** Students who receive a failing grade in the course of their MSc studies will be withdrawn from the program. Students who receive a grade of less than *B-* after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** When students do not complete their master's program within two years, a reasoned request for an extension must be submitted to the thesis committee before they can maintain their registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

The content of the following courses will vary from year to year and will reflect the interests of the department and the instructor in the course. Not all courses will be offered in any given academic year. Details of the courses to be given together with their respective course contents will be available at the beginning of the academic year. All are one-term 3-credit courses.

The following reading courses are designed to meet special needs of students in their areas of research, and involve the presentation, discussion and critical analysis of information from current journal articles.

BIOL 601 Readings in Ecology and Behaviour I
BIOL 602 Readings in Cell and Molecular Biology I
BIOL 606 Readings in Organismal Biology I
BIOL 607 Readings in Ecology and Behaviour II
BIOL 608 Readings in Cell and Molecular Biology II
BIOL 609 Readings in Organismal Biology II
BIOL 612 Advanced Topics in Evolution
BIOL 613 Advanced Topics in Behavioural Ecology
BIOL 614 Advanced Topics in Ecology
BIOL 615 Advanced Topics in Animal Biology
BIOL 630 Advanced Topics in Bioinformatics
BIOL 631 Advanced Topics in Biotechnology
BIOL 632 Advanced Topics in Cell Biology
BIOL 635 Advanced Topics in Molecular Genetics
BIOL 640 Advanced Topics in Plant Biology
BIOL 680 Advanced Topics in Biology
BIOL 685 Advanced Topics in Microbiology
BIOL 696 Master's Research and Thesis (36 credits)

The following courses in Biochemistry may be taken for credit in the program.

CHEM 670 Selected Topics in Biochemistry and Biophysics
CHEM 671 Structure and Function of Biomembranes
CHEM 673 Neurochemistry
CHEM 677 Enzyme Kinetics and Mechanism
CHEM 678 Protein Engineering and Design

BIOL 616 Current Advances in Ecological Research
This course is given in alternate years and reviews selected areas of current research in ecology, evolution and behaviour through critical analysis of recent publications. Topics vary from year to year, and are determined in part by the interests of the students. Material covered may include papers published in refereed journals, monographs or books on specialized topics, or new textbooks covering advanced topics in a relevant area. Students are responsible for giving class presentations of selected material, leading class discussions, and submitting critiques and answers to assigned essay questions. Grading is based upon class participation, oral presentations and written work. Lectures only. (No laboratory component).

BIOL 622 Advanced Techniques in Ecology *

This course introduces students to a variety of techniques of experimental design, data collection, and quantitative analysis. Students participate in a series of modules, each of which presents experimental and analytical techniques appropriate for one area of modern research in ecology, behaviour, or evolution. Some modules require students to collect and subsequently analyze original data from field or laboratory settings. Modules and their contents may vary from year to year. Tutorials and laboratory.

BIOL 623 Advanced Applied Ecology and Conservation *

This course applies principles of ecology at the individual, population, community and ecosystem level to identify and solve practical environmental problems. Topics include pollution, climate change, and farming, harvesting renewable resources, designing nature reserves and conserving bio-diversity. Lectures and tutorials.

BIOL 624 Advances in Decomposer Communities and Nutrient Cycling *

This course examines the role of the microbial community in the fundamental processes of decomposition and nutrient cycling. We discuss the role of microbes in the breakdown of organic molecules and the release and transformation of mineral elements. Emphasis is placed on the interactions between decomposition and on the interactions between bacteria, fungi, and the microbes in the maintenance of nutrient cycles. Lectures and laboratory.

BIOL 633 Advanced Immunology *

The role of the immune system in maintenance of body homeostasis will be presented with particular reference to cells and tissues of the immune system, their organization as well as their structural and functional relationships. Topics include: maturation and differentiation of B and T lymphocytes; structure and properties of antibodies; immune responses to antigens; genetic aspects of antibody synthesis; immunological considerations in AIDS, cancer, and autoimmune diseases. Lectures and seminars.

BIOL 634 Advanced Cell Biology *

Lectures dealing with selected topics in mammalian cell biology. These include introduction to the elements of cell biology. Introduction to the elements of cell culture with reference to the growth and function of non-differentiated and differentiated cells. Control of cell cycling under normal and abnormal states, mechanisms of peptide and steroid hormone action with emphasis on intracellular signaling pathways. The control of gene transcription and detailed analysis of the effect of host cell factors on virus replication. Lectures only.

BIOL 660 Advanced Plant Biochemistry *

Biochemical study of the natural constituents and secondary metabolites unique to plants. Their biosynthesis, biotransformations, and functions in plants, as well as their economic and pharmacologic importance are stressed. Lectures only.

BIOL 661 Advanced Tissue Culture *

This course looks at plant-growth regulators, nutritional requirements, and other factors necessary for in-vitro culturing of plant cells and tissues. The course also discusses methods available for nuclear transfers and the propagation of transformed plants. Lectures only.

BIOL 670 Scientific Communication

This course is offered every other year and is open to all graduate students in Biology or by special permission from the instructor. It is designed to present the requirements for publishable scientific writing, successful research proposals and the presentation of oral papers at scientific meetings. The course emphasizes good writing habits, focuses on the importance of thought, the conciseness of statements and clarity of exposition. The course combines lectures, group discussions, workshops and oral presentations. Marks are based on a number of written assignments, oral presentations as well as participation in class.

BIOL 671 Scanning Electron Microscopy *

This course is given alternate years in the Summer session and explains both the theory and practice of instrumentation and methodology. Students learn to operate the Scanning Electron Microscope (SEM) and ancillary equipment such as sputter-coater and the critical point drier. Hands-on learning experience is stressed to acquire familiarity with special techniques. Instructions cover three aspects: instrumentation, specimen preparation (fixation and drying), and specimen mounting and coating. Tutorials and laboratory.

BIOL 687 Advanced Molecular Genetics *

This course concentrates on basic microbial and molecular genetics, introducing isolation and characterization of mutants, methods of mapping mutants, transposons, episomes, and recombinant DNA techniques. Lectures and conferences.

BIOL 688 Advances in Biological Regulatory Mechanisms *

This course examines the molecular basis of the control of metabolic pathways with an emphasis on procaryote systems. The course concentrates on the analysis of the rationale of experimentation used to elucidate these regulatory mechanisms. Lectures and conferences.

BIOL 689 Advanced Techniques in Molecular Biology *

Theory and practice of modern experimental procedures of molecular biology, including use of restriction enzymes, gene cloning, and hybridizations, DNA sequencing, site-directed mutagenesis, and the use of bacteria and phage in biotechnology. Laboratory and tutorials.

BIO 690 Advanced Gene Structure *

This course deals with gene regulation in eukaryotes. Topics covered include transcription, transcript processing, translation, and post-translational processes. Lectures only.

***** Course descriptions listed here correspond to undergraduate course descriptions except for BIOL 616 and 670 which are not available to undergraduate students. It is understood that an instructor who grants written permission to register in the course as a graduate student will require extra work from the students for graduate credit. These courses are open to doctoral students only under exceptional circumstances.

Diploma in Biotechnology and Genomics

Admission Requirements. To be considered for admission, students must hold a BSc degree from an accredited university with at least fifteen credits in courses at the 200 or 300 level in the following subjects: genetics, cell biology, molecular biology, biochemistry, and 3 credits of laboratory in one or more of the previous subjects. In addition, applicants should have obtained an undergraduate grade point average (GPA) of 3.00 (on a scale with a maximum of 4.30).

International students whose undergraduate degree was not obtained in an English-speaking university must have recently achieved a TOEFL iBT score higher than 100 (600 for TOEFL PBT). A recent advanced GRE is recommended for international students.

Requirements for the Diploma

- **Credits.** Students are required to complete a minimum of 30 credits, comprised of 24 credits of course work and a 6-credit research project. Of the 30 credits required, 21 are designated as core.
- **Courses.** Credit courses for the diploma program are listed below. All courses are 3 credits unless otherwise indicated.

  Core Courses (21 credits)

  BIOL 510 Bioinformatics
  BIOL 511 Structural Genomics
  BIOL 512 Functional Genomics
  BIOL 515 Biotechnology and Genomics Laboratory
  BIOL 516 Project in Biotechnology and Genomics (6 credits)
  PHIL 530 Ethical, Legal and Social Implications of Biotechnology

  Elective Courses (9 credits)

  BIOL 520 Bioinformatics Programming
  BIOL 521 Industrial and Environmental Biotechnology
  BIOL 523 Agriculture and Agri-Food Biotechnology
  BIOL 524 High-throughput Instrumentation

CHEM 678 Protein Engineering and Design
CHEM 690 Selected Topics in Instrumentation

Academic Regulations

- **GPA Requirements.** Students having completed at least four courses are assessed at the end of each academic year based on creditable courses completed after their first registration in the program. To be permitted to continue, students must have obtained a cumulative grade point average of at least 3.00.
- **C Rule.** Normally a student receiving a grade of *C* in two courses will be withdrawn from the program. Students withdrawn for this reason may petition the Diploma Committee for special consideration. In cases of extenuating circumstances probationary continuation in the program will be considered.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a diploma program for full-time students must be completed within 6 terms (2 years) from the time of initial registration in the program; for part-time students the time limit is 12 terms (4 years).
- **Graduation Requirement.** To graduate, students must have completed all course requirements with a cumulative grade point average of at least 3.00.

Courses

BIOL 510 Bioinformatics
Prerequisites: BIOL 367 or equivalent; COMP 228 (System Hardware) or permission of the Diploma Program Director.
This course provides the tools for life scientists to interpret and analyze biological sequence data. It provides a general overview of the growth in availability of genetic information. The course covers the genetic databases; the rapidly-increasing number of genome databases, including the human genome database; the sequence homology search engines and search algorithms; software for the identification of structural sequence components; and the determination of evolutionary relationships between sequences.

BIOL 511 Structural Genomics
Prerequisite: BIOL 367 or permission of the Diploma Program Director.
This course provides an overview of genome analysis including: cloning systems; sequencing strategies; methods of detecting genes and approaches to mapping genomes. It covers the theory and design of the different approaches, and the analysis of genomic data generated from them.

BIOL 512 Functional Genomics

Prerequisite: BIOL 367 or permission of the Diploma Program Director.

This course focuses on the functional analysis of expressed genes and their products. Course content includes the construction and screening of normalized cDNA libraries, analysis of expressed sequence tags (ESTs), functional analysis by gene knock-outs, localization of gene products by gene knowk-ins, transcription profiling, systematic identification of proteins, and functional analysis of proteins by detection of protein-protein interactions.

BIOL 515 Biotechnology and Genomics Laboratory

Prerequisite: BIOL 368 or permission of the Diploma Program Director.

This is a hands-on course on techniques used in biotechnology and genomics. Experiments conducted in this course include separation and mapping of high molecular weight DNA fragments, shotgun sequencing, ESTs sequencing, protein production in bacteria and fungi, functional analysis of protein products, protein arrays, and *in vivo* detection of protein interactions.

BIOL 516 Project in Biotechnology and Genomics (6 credits)

Prerequisites: BIOL 466; BIOL 368; or permission of the Diploma Program Director.

Each student conducts a project under the supervision of a faculty member at Concordia or other research institutions affiliated with the program. The project topic requires approval by the course coordinator. The project can be taken over an 8-month (10 hours per week) of a 4-month period (20 hours per week) at Concordia or other approved institutions or companies. The project will be chosen from one or more of the following fields: biotechnology, genomics, bioinformatics, and high-throughput experimentation. The nature of the project can be research, development, or application. A student who is working full-time or part-time can pursue the project in his/her place of employment subject to approval. (Approval will only be given to projects which are clearly demonstrated to be independent of the regular work requirement). At the end of the project, the student is required to submit a report on the results of the project and present the results publicly in the form of a scientific poster or a short talk at a scheduled Genomics/Biotechnology Research Day.

BIOL 520 Bioinformatics Programming

Prerequisites: BIOL 510; COMP 248 or equivalent.

This course is an introduction to working with public domain tools for bioinformatics, and the management of computers, software, and databases for bioinformatics. It covers setting up and use of a workstation running Linux, basic Unix commands, and scripting the Unix shell. It also provides an introduction to Perl, python, Java, and C++ programming languages, the Apache web server, and the mySQL database.

BIOL 521 Industrial and Environmental Biotechnology

Prerequisites: BIOL 511; BIOL 512.

This course provides an in-depth evaluation of current biotechnology tools used in pharmaceutical and

forestry industries, and in environmental remediation. New technologies and genomic approaches that can be applied to these processes are also discussed.

BIOL 523 Agriculture and Agri-Food Biotechnology

Prerequisites: BIOL 511; BIOL 512.

This course provides an overview on the use of biotechnology in agriculture and in the agri-food industry. Plant genomics and genetic manipulation of plants are emphasized. Also discussed are biotechnology methods used in reducing agricultural pollutants and converting agricultural surplus to energy.

BIOL 524 High-throughput Instrumentation

Prerequisites: BIOL 511; BIOL 512.

This is a hands-on introduction to high-throughput instruments used in biotechnology and genomics. Students are exposed to capillary electrophoresis-based DNA sequencing, microplate-based PCR reactions and purification of PCR products, construction of DNA chips, microarray scanning, and liquid handling robotics. Enrolment in this course is restricted to ten students.

PHIL 530 Ethical, Legal, and Social Implications of Biotechnology

Prerequisite: BIOL 367 or permission of the Diploma Program Director.

This interdisciplinary course examines some of the ethical, legal, and social implications of recent developments in biotechnology, genomics, and bioinformatics. Students explore current debates about biotechnologies in the fields of agricultural biotechnology, global development, and environmental risk. Issues such as commercialization and intellectual property, the role of media and public perceptions of biotechnologies, and social responsibility and policy formation are also addressed.

Chemistry and Biochemistry

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Chemistry Website

Doctor of/Doctorate in Philosophy (Chemistry)
Master of/Magisteriate in Science (Chemistry)

Doctor of/Doctorate in Philosophy (Chemistry)

Admission Requirements. The normal requirement for admission is a Master of Science degree in Chemistry with high standing from a recognized university. Comparable qualifications in biology or biochemistry are also acceptable for applicants wishing to do graduate studies in biochemistry. Upon recommendation by full-time members of the faculty of the Department of Chemistry and Biochemistry, students enrolled in the Master of Science (Chemistry) program at Concordia University who have completed a minimum of 6 credits of graduate level course work and who have shown themselves to be outstanding through performance in research may apply for permission to proceed directly to doctoral studies without submitting a master's thesis (fast-tracking). Outstanding students who have maintained a grade point average of greater than 3.50 in their last two years of study and those with external scholarships (NSERC, CIHR, FQRNT) may also apply to the PhD program directly (fast-tracking) from their BSc program.

It is also possible to carry out PhD studies on a CO-OP basis with the collaboration of an employer. A CO-OP graduate student conducts research of interest to the employer, normally in the employer's laboratory, but directs the project toward a thesis topic acceptable to the department at Concordia and under the guidance of an academic supervisor in the department. The student will spend one term, normally with the support of an employer, gaining experience teaching in undergraduate laboratories and participating actively in the departmental seminars. This program will be available in areas of chemistry and biochemistry where the Department has the resources to provide a suitable academic co-supervisor. It is a condition of the program that the employers agree to the publication of thesis results. Prospective applicants should contact the Department for further details.

Requirements for the Degree

- **Credits.** A candidate entering the doctoral program with a master's degree is required to complete a minimum of 90 credits. A candidate entering the doctoral program under accelerated admission

(fast-tracking) from the BSc program is required to complete a minimum of 9 credits from graduate courses listed under *Topics* in addition to the regular 90 credits; a candidate entering the doctoral program under accelerated admission (fast-tracking) from the MSc program is required to complete a minimum of 3 credits listed under *Topics* in addition to the regular 90 credits.

- **Residence.** The minimum period of residence is two years (6 terms) of full-time graduate study beyond the master's degree or three years (9 terms) of full-time graduate study (or the equivalent in part-time study) beyond the bachelor's degree for those students who are permitted to enrol for doctoral studies without completing a master's degree. It should be understood that this is a minimum requirement, and that a longer period may be necessary in order to complete all of the work that is required for the degree.
- **Courses.** The following are required of fully-qualified students:
    - 6 credits from courses listed under *Topics*, in the general field of the student's research project.
    - CHEM 896: Research Proposal and Comprehensive Examination (9 credits).
      A student in the doctoral program is required to present a progress report on his/her research and on future research plans. The presentation should reflect the student's awareness of current research in his/her field and demonstrate an ability to carry out a significant research problem and provide a rational approach to its solution. The student's knowledge and understanding of fundamental chemical and biochemical principles will also be examined.
      The student is expected to complete CHEM 896 within 18 months of admission directly into the PhD program, or within 28 months of admission via the MSc stream. In exceptional circumstances the department may permit an extension of time for completion of this course. The CHEM 896 Examining Committee assigns one of the following two grades: (a) PASS - the student is admitted to candidacy for a PhD degree in Chemistry; (b) FAIL - the student must withdraw from the program.
    - CHEM 855: Doctoral Research and Thesis (69 credits).
    - CHEM 667 and 668: Seminars (3 credits each).
      These seminar courses provide opportunities for the student to prepare and present material concerning a current research problem in an area of chemistry or biochemistry to a critical audience. One seminar, CHEM 668, is on the student's own research while the other, CHEM 667, must be a literature seminar on a different topic. The courses are designed to give students practice at communicating and defending their ideas on a research topic in a professional forum, and should successfully inform an audience of chemists and biochemists.
    - With permission from their supervisory committee students are allowed to substitute graduate level courses from other departments relevant to their research problems, or

professional development (e.g., selected MBA courses) as partial fulfillment towards their degree requirements.

- **Thesis.** Students will work on a research topic under the direction of a faculty member and present an acceptable thesis at the conclusion (CHEM 855: Doctoral Research and Thesis). Students may submit a manuscript-based thesis following the guidelines outlined in the section on Thesis Regulations in this calendar. In addition, a public oral examination will be conducted to test the student's ability to defend the thesis.
- **Seminars.** Each student is **required** to attend and participate in departmental seminars.
- **Cross-Registration.** Students may, with the permission of their supervisory committee, cross-register for courses falling in the *Topics* categories in other Quebec institutions.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored annually. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 6 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students who obtain a *C* grade in a course are required to repeat the course or take another course. Students who receive more than one *C* grade during the course of their PhD studies will be required to withdraw from the program. Students may apply for re-admission. Students who receive another *C* after re-admission will be required to withdraw from the program and will not be considered for re-admission.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a doctoral degree must be completed before or during the calendar year, six years (18 terms) of full-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Science (Chemistry)

Admission Requirements. The admission requirement is an honours or specialization degree in chemistry or biochemistry or its equivalent. Comparable qualifications in related areas such as biology or physics may also be acceptable. Qualified applicants requiring prerequisite courses may be required to take up to two such courses in addition to their regular graduate program. Applicants with deficiencies in their undergraduate preparation may be required to take a qualifying program. This does not apply to International Students.

Candidates for the master's degree may register on either a full-time or a part-time basis. It is also possible to carry out MSc studies on a CO-OP basis with the collaboration of an employer. CO-OP MSc graduate studies are arranged as a form of a full-time or part-time program where the student conducts research of interest to the employer, normally in the employer's laboratory, but directs the project toward a thesis topic acceptable to the department at Concordia and under the guidance of an academic supervisor in the department. The student will spend one term, normally with the support of an employer, gaining experience teaching in undergraduate laboratories and participating actively in the departmental seminars. This program will be available in areas of chemistry and biochemistry where the department has the resources to provide a suitable academic co-supervisor. It is a condition of the program that the employers agree to the publication of thesis results. Prospective applicants should contact the Department for further details.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study. The degree can normally be completed in two years (6 terms) of full-time study.
- **Courses.** The following are required:
    - 6 credits from courses listed under *Topics*, in the general field of the student's research project;
    - Another 3 credits from courses listed under *Topics*, outside the student's research project, acceptable to the supervisory committee;
    - CHEM 655: Master's Research and Thesis (33 credits);
    - CHEM 666: Seminar (3 credits).
      This course provides an opportunity for the student to prepare and present materials concerning their current research problem in an area of chemistry or biochemistry to a critical audience. It is designed to give students practice at communicating and defending their ideas on a research topic in a professional forum, and should successfully inform a broad audience of chemists and biochemists.
    - With permission from their supervisory committee, students are allowed to take graduate level courses from other departments relevant to their research problems, as partial fulfillment towards their degree requirements.
- **Thesis.** Students will work on a research topic under the direction of a faculty member and present an acceptable thesis at the conclusion. CHEM 655 Master's Research and Thesis will be examined by the student's supervisory committee before being accepted by the department. Students may submit a manuscript-based thesis following the guidelines outlined in the section on Thesis Regulations in this calendar. In addition, an oral examination will be conducted before a committee of the department to test the student's ability to defend the thesis.

- **Seminars.** Each student is **required** to attend and participate in departmental seminars.
- **Research Areas.** Areas for possible research are listed before the Doctor of/Doctorate in Philosophy section.
- **Cross-Registration.** Students may, with the permission of their supervisory committee, cross-register for courses falling in the *Topics* categories in other Quebec institutions.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored annually. To be permitted to continue in the program, students must obtain a cumulative Grade Point Average (GPA) of 3.00 based on a minimum of 6 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students who obtain less than a grade of *B-* in a course are required to repeat the course or take another course. Students receiving more than one *C* grade will be withdrawn from the program.
- **F Rule.** Students who receive a failing grade in the course of their MSc studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 4 years (12 terms) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 5 years (15 terms).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

Specific course offerings in subject areas listed under *Topics* will generally vary from year to year, depending on the availability of faculty and the requirements of graduate students in the program. In the MSc program, every student must complete CHEM 666 (Seminar); in the PhD program CHEM 667 (Seminar), CHEM 668 (Seminar), and CHEM 896 (Research Proposal and Comprehensive Examination) must be completed by every student.

Courses are worth 3 credits unless otherwise indicated. Over the next few years the department will offer a selection of courses from those listed below. Additional *Selected Topics* courses may be offered in a given year, and these will be identified by different subtitles. Further information on *Selected Topics* courses will be available from the department at the beginning of each academic year.

Topics in Analytical & Bioanalytical Chemistry

CHEM 610 Selected Topics in Analytical Chemistry
This course explores themes within the area of Analytical Chemistry.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. CHEM 610A, CHEM 610B, etc.

CHEM 612 Analytical Separations
Prerequisite: CHEM 218, 312, or equivalent.
High performance liquid separations on an analytical (non-preparative) scale are surveyed. Fundamental separation mechanisms and application of the techniques are discussed. Emphasis is placed on separations of biologically relevant analytes which include peptides, proteins and nucleic acids. Lectures only.

CHEM 614 Modern Aspects of PracticalMass Spectrometry
Prerequisite: CHEM 494 or equivalent, previously or concurrently.
Theoretical and operational aspects of modern mass spectrometry are discussed in a number of formal lectures and training sessions. All students must carry out an independent mass spectrometry project on their molecules of choice. Projects can be selected from all areas of chemistry, biochemistry or biology including the "omics" sciences (e.g., proteomics, metabolomics).
Note: Students who have received credit for this topic under a CHEM 630 number may not take this course for credit.

Topics in Bioorganic & Organic Chemistry

CHEM 620 Selected Topics in Organic Chemistry
This course explores themes within the area of Organic Chemistry.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. CHEM 620A, CHEM 620B, etc.

CHEM 621 Physical Organic Chemistry
Prerequisite: CHEM 222, 235; CHEM 324 or 325; or equivalent.
Determination of organic reaction mechanisms using kinetics, activation parameters, acid-base catalysis, Bronsted catalysis law, solvent effects, medium effects, isotope effects, substitutent effects, and linear free energy relationships. Lectures only.

CHEM 623 Organic Synthesis
Prerequisite: CHEM 222, 235, 324, or equivalent.
This course is concerned with synthetic strategy and design. It provides an introduction to advanced synthetic methods and reagents, involving heteroatoms such as sulphur, phosphorus, tin and selenium, as

well as an overview of the uses of protecting groups in organic chemistry. The concept of retrosynthesis and a few asymmetric reactions are discussed using syntheses of natural products from the literature as examples. Lectures only.

CHEM 625 Nucleic Acid Chemistry

Prerequisite: CHEM 221, 222, 271, or equivalent.

This course introduces students to various topics in nucleic acid chemistry. The topics include nomenclature, structure and function of RNA and DNA; techniques and methods to investigate nucleic acid structure; DNA damage and repair; interaction of small molecules and proteins with nucleic acid; oligonucleotide-based therapeutics (antisense, antigene, RNAi); synthesis of purines, pyrimidines and nucleosides; and solid-phase oligonucleotide synthesis. Lectures only.

Note: Students who have received credit for this topic under a CHEM 620 number may not take this course for credit.

CHEM 626 Reactive Intermediates

Prerequisite: CHEM 324, 325, or equivalent.

This course offers an introduction to reactive intermediates with an emphasis on structure and stability as found in modern (physical) organic chemistry. While the focus is on radicals and carbenes, carbocations are discussed near the end of the term. The material covered is relevant to chemistry and biochemistry. Lectures only.

Note: Students who have received credit for this topic under a CHEM 621 number may not take this course for credit.

CHEM 627 Supramolecular Chemistry

Prerequisite: CHEM 324 or 325; CHEM 335; or equivalent; or permission of the Department.

This course reviews some fundamental aspects of synthetic and biological supramolecular chemistry and nanotechnology. Topics covered may include supramolecular forces, ion binding and ion channels, molecular recognition, self-assembly (meso-scale and molecular-scale), organometallic supramolecular chemistry, dynamic combinatorial chemistry (DCC), and foldamers. Lectures only.

Note: Students who have received credit for this topic under a CHEM 620 number may not take this course for credit.

Topics in Physical Chemistry

CHEM 630 Selected Topics in Physical Chemistry

This course explores themes within the area of Physical Chemistry.

Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. CHEM 630A, CHEM 630B, etc.

CHEM 631 Computational Chemistry

Prerequisite: CHEM 234, 241, 333, or equivalent; or permission of the Department.

This course presents the concepts, tools, and techniques of modern computational chemistry, and provides a very broad overview of the various fields of application across chemistry and biochemistry. The course is divided into two parts: 1) *Molecular structure*, which covers molecular mechanics and elementary electronic structure theory of atoms and molecules; and 2) *Chemical reactivity*, which covers applications of quantum chemistry and molecular dynamics techniques to studies of chemical reactions. The applications discussed include organic molecules and their reactions, peptides and proteins, drug design, DNA, polymers, inorganics, and materials. The course includes a practical component where students acquire hands-on experience with commonly used computational chemistry computer software. Lectures and laboratory.

CHEM 632 Non-equilibrium Thermodynamics

Prerequisite: CHEM 234 or equivalent.

In this course, the basic concepts of classical (equilibrium) thermodynamics are first reviewed, followed by an introduction to statistical thermodynamics which gives a unified method of treating transport processes. At this point, the Boltzmann distribution function is derived, which leads to the statistical interpretation of entropy. Other important thermodynamic functions such as the partition function, the partition function for large ensembles and the Sackur-Tetrode equation are examined. The course also addresses non-equilibrium thermodynamics in the linear domain. The relations describing the production of entropy in irreversible processes due to heat transfer, charge transfer, change of volume, and chemical reactions are examined. The establishment of flux equations and the use of the Onsager reciprocal relations are then applied to the description of a variety of open systems. Lectures only.

CHEM 633 Quantum Mechanics in Chemistry

Prerequisite: CHEM 333, 431/631, or equivalent.

This course includes a thorough review of basic quantum mechanics in both the Schroedinger and Heisenberg representations, electronic structure theory, symmetry and group theory, interaction of matter with light, quantum scattering, the path integral formalism, quantum theories of chemical reaction rates, time-dependent approaches to spectroscopy, wave packet propagation, correlation functions and dynamics processes, and density matrices. Lectures only.

CHEM 635 Interfacial Phenomena

Prerequisite: CHEM 234, 235, or equivalent.

This course examines the physical chemistry of interfaces including surface and interfacial tensions, the absorption of surface active substances/surface excess properties, and surfactant self-assembly. Topics covered may include Gibbs and Langmuir monolayers, micelle formation, emulsions, foams, surfactant liquid crystals, layer-by-layer polymer self-assembly, and biological membranes. Techniques for characterization and applications (biological and industrial) of these systems are addressed. Lectures only.

Note: Students who have received credit for this topic under a CHEM 630 number may not take this course for credit.

CHEM 638 Physics and Chemistry of Solid State Electronic Materials

Prerequisite: CHEM 234, 333, or equivalent.

This course essentially explores how electrical conductivity is influenced by the nature of the chemical bonding in these solid-state materials. The course provides an introduction to solid-state structures and then goes on to explore band theory, the central model used to describe electrical conductivity in the following three categories of electronic materials: conductors, semiconductors, and insulators. Finally the course explores the extension of the band model to interpret electrical conductivity in molecular semiconductors and charge-transfer complexes. Lectures only.

Topics in Bioinorganic & Inorganic Chemistry

CHEM 640 Selected Topics in Inorganic Chemistry

This course explores themes within the area of Inorganic Chemistry.

Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. CHEM 640A, CHEM 640B, etc.

CHEM 643 Organometallic Chemistry

Prerequisite: CHEM 324, 341, or equivalent.

This course covers the structure and properties of organometallic compounds, their main reactions and their application in catalysis and organic chemistry. Lectures only.

CHEM 644 Physical Methods in Chemistry

This course provides an in-depth evaluation of the different methods used in modern physical chemistry such as laser, microwave, FT-IR, electron spin resonance, nuclear magnetic resonance, x-ray photoelectron, x-ray diffraction and fluorescence, Auger eletron, Mössbauer, and gamma-ray spectroscopic analysis, as well as scanning probe microscopy and mass spectrometry. Lectures only.

CHEM 645 Bioinorganic Chemistry

Prerequisite: CHEM 241, 271, or equivalent.

Role of metals in biochemical systems. Essential trace elements, zinc enzymes, oxygen transport and storage, metalloproteins and biological electron transfer, structure-function relationships in heme enzymes, nitrogen fixation; model compounds for metalloproteins and metalloenzymes. Lectures only.

CHEM 646 Industrial Catalysis

Prerequisite: CHEM 234, 235, or equivalent.

Basic and recent concepts in catalysis are described with particular emphasis on heterogenous catalysis. The technical, economic and environmental aspects of industrial catalysis are covered. The processes to be studied are chosen from the petroleum industry, the natural gas and coal processing industry, and the production of thermoplastics and synthetic fibres. The course ends with a rapid survey of problems associated with the treatment of industrial pollutants and with catalytic converters. Lectures only.

Topics in Multidisciplinary Chemistry

CHEM 650 Selected Topics in Multidisciplinary Chemistry
This course explores themes within the area of Multidisciplinary Chemistry.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. CHEM 650A, CHEM 650B, etc.

CHEM 651 Nanochemistry
Prerequisites: CHEM 217, 218, 221, 222, 234, 235, 241, or equivalent.
This modular course covers the areas of production, characterization and applications of nanoscale structures and materials. Each module is taught by a different professor as well as guest lecturers. Topics may include (but are not limited to): size dependent properties, synthesis of organic and inorganic nanostructures, self-assembled structures, chemical patterning and functional nanopatterns, biomaterials. Nanometer scale fabrication techniques such as lithographic methods, nano-stamping and patterned self-assembly are discussed. Modern analysis techniques such as atomic force microscopy and electron microscopy, which are used to map and measure at the single molecule level are introduced. Applications such as photonics, optical properties, biodetection and biosensors, micro- and nano-fluidics, nanoelectronics and nanomachines are presented. The course includes a term project carried out using the nanoscience facilities held in the department research labs.

CHEM 658 Aquatic Biogeochemistry
Prerequisite: CHEM 217, 218, 312, or equivalent.
The major aim of this course is to present a quantitative treatment of the variables that determine the composition of natural waters. Chemical equilibrium is the central theme of the course, but consideration is also given to kinetics, steady-state and dynamic models. Related themes include global chemical cycles, air and water pollution, as well as current research topics in water chemistry and chemical oceanography. Lectures only.
Note: Students who have received credit for CHEM 618 or for this topic under a CHEM 610 number may not take this course for credit.

Topics in Biochemistry

CHEM 670 Selected Topics in Biochemistry and Biophysics
This course explores themes within the area of Biochemistry and Biophysics.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. CHEM 670A, CHEM 670B, etc.

CHEM 676 Structure and Function of Biomembranes
Prerequisite: BIOL 266, CHEM 375, or equivalent.
Examples from the current literature are used to discuss what is known about how the membranes of biological organisms are assembled and the roles that these membranes play in a number of important processes. Emphasis is placed on the transport of proteins to and through biomembranes and the roles that membranes play in metabolite and ion transport. Where applicable, the significance of these processes is illustrated by examining the roles of membranes in health and disease. Lectures only.
Note: Students who have received credit for CHEM 671 may not take this course for credit.

CHEM 677 Enzyme Kinetics and Mechanism
Prerequisite: CHEM 271, 375, or equivalent.
This course explores steady-state kinetics, including such topics as the use of initial velocity studies and product inhibition to establish a kinetic mechanism; nonsteady-state kinetics, isotope effects, energy of activation, and the detailed mechanisms of selected enzymes. Lectures only.

CHEM 678 Protein Engineering and Design
Prerequisite: CHEM 271, 375, or equivalent.
This course examines the principles behind protein design, how techniques of protein engineering are used, and the methods used to assess protein properties. Examples include studies of protein stability, structure-function relationships, and applications to drug design. Lectures only.

Topics in Instrumentation

CHEM 690 Selected Topics in Instrumentation
This course explores themes within the area of Instrumentation.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. CHEM 690A, CHEM 690B, etc.

CHEM 691 Magnetic Resonance Spectroscopy
Prerequisite: CHEM 222, 393, or equivalent.
This course is designed to provide the background in magnetic resonance theory necessary to understand modern high-resolution NMR experiments and instrumentation. The basic theory in the introductory section

also applies to electron spin resonance (ESR). Relaxation and through-bond and through-space interactions, and experiments to investigate them are considered. Spin manipulations and behaviour in multiple-pulse, Fourier transform NMR techniques used for common spectral editing and two-dimensional experiments are discussed. Lectures only.

CHEM 692 Experimental Protein Chemistry
Prerequisite: CHEM 477 or equivalent or permission of the Department.
This "hands on" course introduces students to the common techniques used to study the structure and function of proteins and other macromolecules. Techniques covered include circular dichroism spectroscopy, fluorescence, UV/Vis spectroscopy, Fourier transform infrared spectroscopy, isothermal titration microcalorimetry, analytical ultracentrifugation, and protein crystallization/X-ray crystallography. The course includes theory, applications of the technique to the study of protein structure and function, and basic practice experiments to become familiar with the instrument and data analysis. For some of the techniques covered hands-on use will be limited. Each student is required to carry out a project on his/her own protein of interest. Each participant asks a specific question about a protein and then uses the techniques covered in the course to address the question. Lectures and laboratory.
Note: Students who have received credit for this topic under a CHEM 690 number may not take this course for credit.

Theses, Seminars, Comprehensive Exam and Special Courses

CHEM 655 Master's Research and Thesis (33 credits)
CHEM 666 MSc Seminar (3 credits)
CHEM 667 PhD Literature/Topic Seminar (3 credits)
CHEM 668 PhD Research Seminar (3 credits)
CHEM 855 Doctoral Research and Thesis (69 credits)
CHEM 896 Research Proposal and Comprehensive Examination (9 credits)

Classics, Modern Languages and Linguistics

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Classics, Modern Languages and Linguistics Website

Master of/Magisteriate in Arts (Hispanic Studies)

Admission Requirements. The normal requirement for admission into the MA is an Honours or Specialization in Spanish, or equivalent degree with a minimum GPA of 3.30 on a 4.30 scale; official transcripts; curriculum vitae; three letters of reference; statement of purpose in English or French; oral and written competence in Spanish and English or Spanish and French. Applicants must submit a 5-minute voice sample in Spanish in an audio file (mp3, iTunes, or wma) and a 1000-word writing sample in Spanish. All applications will be reviewed by the Graduate Studies Committee.

Language Requirements. International applicants whose primary language is not English must provide eligible proof of English proficiency. The minimum required score for TOEFL iBT is 80 and 550 for TOEFL PBT. Applicants may also submit IELTS (International English Language System) results. The minimum acceptance score for IELTS is 6.5.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement for the Master of/Magisteriate in Arts (Hispanic Studies) is three terms (one year) of full-time study, or the equivalent in part-time study.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

- **C Rule.** Students who obtain a C grade in a course will be required to repeat the course or take another course to be chosen in consultation with the supervisor together with the Graduate Program Director. Students receiving more than one C grade will be withdrawn from the program. Students may apply for readmission. Students who receive another C grade after re-admission will be withdrawn from the program and may not reapply.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for readmission. Students who receive another failing grade after re-admission will be withdrawn from the program.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (five years).
- **Graduation Requirement.** In order to graduate, students must have accumulative GPA of at least 3.00.

Courses

Students are required to complete 18 credits of coursework. The following core courses are required (six credits):

SPAN 601 Discourse Analysis and Research Methods (3 credits)
SPAN 603 Introduction to the Pedagogy of Spanish (3 credits)

Twelve credits of elective courses may be chosen from the following list:

SPAN 605 Independent Study (3 credits)
SPAN 621-630 Topics in Applied Linguistics and the pedagogy of Spanish (3 credits)
SPAN 631-640 Topics in Spanish Translation (3 credits)
SPAN 641-650 Topics in Critical Thinking and Theory (3 credits)
SPAN 651-660 Topics in the Subject and Identity (3 credits)
SPAN 661-670 Topics in Exile and Marginality (3 credits)
SPAN 671-680 Topics in History of Ideas in the Hispanic World (3 credits)
SPAN 681 Research Seminar (3 credits)
SPAN 698 Topics in Current Research (3 credits)

Note 1: Subject matter in "topics" courses varies from term to term and from year to year. Details of the courses to be given together with their respective course contents will be available at the beginning of the academic year.

Note 2: In consultation with the Graduate Program Director, students may replace up to 6 credits of reading courses, or credits at the graduate level in another discipline. Permission of the Graduate Program Director of the respective program must also be granted. Interdisciplinary courses, where relevant to the student's program, may include courses at the graduate level in the Departments of Communication Studies, Education, English, Études françaises, Philosophy, Sociology and Anthropology, and Religion. Approval of courses from these departments will be sought on a per-case basis.

Note 3: Students who wish to concentrate in Pedagogy or Translation may take six credits at the graduate level in the department relative to their concentration.

Twenty-seven credits in:

SPAN 694 Thesis Proposal (3 credits)
SPAN 695 Thesis (24 credits)

OR:

SPAN 682 Research Paper I (12 credits)
SPAN 683 Research Paper II (15 credits)

SPAN 601 Discourse Analysis and Research Methods (3 credits)
This course is designed to provide both a broad theoretical introduction and concrete practice in the research and analysis of literary and cultural texts. Students consider, critique, and incorporate theory and criticism into the articulation and elaboration of an analytical essay. They also implement fundamental research practices such as performing bibliographical searches and documentation; implementing narrative, argumentative, and persuasive rhetorical strategies; and, finally, developing a rigorously defended and coherent argument.

SPAN 603 Introduction to the Pedagogy of Spanish (3 credits)
In this course, students learn and implement important aspects of teaching methodology and techniques. Opportunities for observation of Spanish classes are provided. Students apply the techniques learned in micro-teaching and peer teaching exercises. Assignments include lesson planning and the evaluation of teaching performance. This course will be offered in the first semester of every year. In order to integrate practice into the curriculum, an effort will be made to offer students an opportunity to teach an Introductory Spanish language course.

SPAN 605 Independent Study (3 credits)
Under the supervision of a faculty member, the student undertakes research in a defined topic related to the student's interest and the faculty member's field of specialization. A final research paper is required.

SPAN 621-630 Topics in Applied Linguistics and the Pedagogy of Spanish (3 credits)
The courses in this area address different theoretical aspects of Spanish pedagogy, such as learning theories, curriculum planning, interlanguage development, the teaching and learning of phonology, phonetics, grammar, and vocabulary acquisition.

SPAN 631-640 Topics in Spanish Translation (3 credits)
Courses in this thematic area will explore different theoretical aspects of translation, such as languages in contact (bilingualism, interpretation, Chicano/a literature, contrastive grammars), diachronic and synchronic linguistic variation and its representation in time and space, as well as provide students with the opportunity to practice their translation skills.

SPAN 641-650 Topics in Critical Thinking and Theory (3 credits)
Through the study of cultural discourses of the Hispanic world, this thematic area aims to improve the understanding and praxis of rational analysis and argumentation, as well as to examine the intimate relationship between linguistic/language theory and cultural analysis. Topics may include rhetoric, pragmatics and hermeneutics, as well as the analytical practices of a number of linguistic and literary theorists.

SPAN 651-660 Topics in the Subject and Identity (3 credits)
This area examines the artistic, literary and philosophical conceptualizations of subject and identity in the Hispanic world, including the problematics of gender, the (visual) image, the gaze, the body, etc. Topics may include the image of the gendered subject, analyses of dramatic works and film, the 'visibility' of the subject in the media, literature and/or paraliterature of a period and/or geographical area.

SPAN 661-670 Topics in Exile and Marginality (3 credits)
This thematic area examines exile as an epistemological, ontological, aesthetic, linguistic and political category within the Hispanic world. Courses may concentrate on writers and/or artists in exile, political and national identity, as well as gender issues in different eras and geographical spaces. Topics may include the examination of discourses of crisis in different eras: modernization; *testimonio* literature; the *boom*; the Chicano world and its reality; postmodernism/colonialism.

SPAN 671-680 Topics in the History of Ideas in the Hispanic World (3 credits)
This area examines the philosophical and ideological bases of artistic expression in the Hispanic world, in its European, American and Asian contexts. Topics may include the Caliban/Ariel dichotomy in Latin America, the rhetoric of independence and revolution, modernity/postmodernity. Poetic and essayistic discourses of Spain and Spanish America form the corpus for this area.

SPAN 681 Research Seminar (3 credits)
Students meet with peers and faculty for discussion and presentation of their current research.

SPAN 682 Research Paper I (12 credits)
Under the supervision of a faculty member, students undertake a substantial research project, to be completed by the preparation of a research paper.

SPAN 683 Research Paper II (15 credits)
Under the supervision of a faculty member, students undertake a research project, to be completed by the preparation of a research paper.

SPAN 694 Thesis Proposal (3 credits)
Under the supervision of a thesis supervisor, the student writes a proposal presenting a research topic, whose overall goal is to demonstrate that the student is capable of undertaking an independent research project. In the proposal, the student provides: 1) the linguistic, cultural or literary phenomenon or corpus to be studied; 2) a critical and theoretical framework for the study; and 3) a preliminary bibliography. This proposal is submitted to the thesis director and Graduate Program Director for consideration.

SPAN 695 Thesis (24 credits)
The thesis consists of the formulation and presentation of the research results. Each thesis is examined by a committee consisting of the student's supervisor and at least two other scholars from the department and/or scholars from relevant disciplines in other departments or institutions.

SPAN 698 Topics in Current Research (3 credits)
When offered, content will depend on the theme designated by the program.Students may re-register for this course, provided that the course content has changed. Change in content will be indicated by the letter following the course number.

Communication Studies

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Communication Studies Website

Doctor of/Doctorate in Philosophy (Communication)
Master of/Magisteriate in Arts (Media Studies)
Diploma in Communication Studies

Doctor of/Doctorate in Philosophy (Communication)

Admission Requirements. Applicants must have a Master of/Magisteriate in Arts in Communication or its equivalent. Applicants will be selected on the basis of the excellence of their past academic records. Applicants must include a thoroughly articulated outline of a research project with their application.

Admission Criteria

- Excellence and pertinence of academic background.
- Promise as a scholar.
- Relevance of proposed research to the program.
- Feasibility of proposed research in terms of material and faculty resources.
- Ability to understand English and French.
- Availability of a faculty member to direct the applicant.

While there are no fixed quotas, admission is limited by the availability of the program's faculty to supervise students.

Language Requirements. Applicants should have a level of competence that would allow them to read technical material and follow lectures and discussions in **both English and French**. The ability to speak and write with facility in both languages is not required; students may participate in discussions, write reports, examinations and theses in English or French, as they choose. Applicants whose prior degrees are not from an English or French-speaking university are required to submit TOEFL scores. The minimum TOEFL iBT score required is 106 (or 623 for TOEFL PBT).

Requirements for the Degree

- **Credits.** A fully qualified candidate entering the program with a master's/magisteriate degree is required to complete a minimum of 90 credits. These are apportioned as follows: courses and seminars, 21 credits; thesis proposal, 6 credits; and thesis, 63 credits. Typical progress in the program consists of:

  Year 1

  - Courses and Seminars: four courses and seminars (12 credits).
  - Doctoral examination: COMS 810. (non-credit)

  Year 2

  - Courses and seminars: Doctoral Pro-seminar COMS 830 (6 credits) and one additional course or seminar from among the programs offerings (3 credits).
  - Doctoral Thesis Proposal: COMS 890 (6 credits).

  Year 3

  - Doctoral Thesis Research: COMS 896 (63 credits).
- **Residence.** The minimum period of residence is six terms including two summer terms of full-time study, or its equivalent in part-time study. Of this, three terms must be taken consecutively. Students will be assigned an academic advisor when they first register. Students will be required to choose a thesis director before the end of their third term in the program.
- **Courses.** In order to favour inter-university exchange and broaden the training of the students enrolled in the program, all the program's courses are open to all students in the program, regardless of the university at which they are enrolled. All students must enrol in the Doctoral Pro-seminar, COMS 830 (6 credits); and enrol in seminars and courses from among the Program's offerings for a total of 21 credits.
- **Doctoral Examination.** Students must successfully pass an examination based on the student's research areas and interests. The committee for the examination is composed of three professors, including the student's thesis director. The doctoral examination usually takes place in the summer of the first year, and is undertaken between May 15 and the first week of September. The written portion of the exam is defended orally in September or October. It is recommended that students complete their exam within the first two years of enrolment in the Joint Program. It is compulsory to finish the examination before registering in the Doctoral Pro-Seminar. It is also compulsory to finish the exam before completing the thesis proposal. Students who fail this examination are permitted to take it a second time in the following term. Students failing a second time are obliged to withdraw from the program. Students should consult the program regarding specific examination procedures and requirements.

- **Doctoral Pro-seminar.** In order to promote the growth of an intellectual community within the program and an exchange among the program's four areas, students are required to register in the theory and research pro-seminar known as the Doctoral Forum. Students registered in this seminar are required to present a first draft of their thesis proposal. Students typically register in the doctoral forum in the second or third year of their studies. It is compulsory to finish the doctoral examination before registering in the Doctoral Forum. All members of the program are invited to attend the seminar.
- **Thesis Proposal.** In the term following the completion of course work (usually the sixth term) students should submit a thesis proposal to their thesis director. Students must have completed the doctoral examination before registering for the thesis proposal. The thesis proposal should be completed within three years of the student's first enrolment. The proposal must be defended orally before a committee of three professors appointed by the program. This committee will usually be composed of members from at least two of the participating universities. Students must demonstrate the viability of their project and their capacity to undertake doctoral-thesis research. The proposal may be accepted, returned for modifications, or rejected. The rejection of a proposal will result in the student being withdrawn from the program. A student whose proposal is accepted will be admitted to candidacy for the PhD.
- **Thesis Research.** All degree requirements, including the thesis, must be completed within six years of the student's first enrolment for full-time studies and eight years for part-time studies. The thesis must be based on extensive research in primary sources, make an original contribution to knowledge, and be in an acceptable literary form. For purposes of registration, this work will be designated as COMS 896: Doctoral Thesis Research.

  The doctoral thesis is based on extensive primary research; the goal is to make an original contribution to knowledge. The traditional research thesis is ideally no less than 225 pages and no longer than 350 pages. It must be written in an acceptable literary form and represent a contribution to theoretical or empirical knowledge in the field of communication. Students also have the possibility to produce a *research-creation thesis* which is to meet the same standards of rigour as the traditional research thesis. The research-creation thesis includes a practical component of creation or innovative production in the field of media/communications or digital/computerized communications, as well as a written component of approximately 150 pages demonstrating the contribution to the advancement of knowledge in the field. A digital reproduction of the practical component must be attached to the manuscript at the time of submission.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be

on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

- **C Rule.** Students who receive more than one *C* during the course of their PhD studies will be required to withdraw from the program. Students may apply for re-admission. Students who receive another *C* after re-admission will be required to withdraw from the program and will not be considered for re-admission.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of initial registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Domains and Courses

COMS 800 Integrative Seminar (3 credits)
This course proposes to engage first-year students in an epistemological conversation concerning different approaches to the conceptualization of communication and to the range of research problematics elaborated in the field and in the program. The expected outcomes would include: a broad understanding of the relations between different domains within the discipline; the ability to recognize the links between epistemological assumptions, theory construction, the formation of research problematics and methodological approaches; a familiarization with the main fields of strength within the program; and the development of the ability to engage in dialogue with colleagues in different domains of research.

ICTs (Information and Communication Technologies) and Society

COMS 841 Cultural Industries (3 credits)
This course examines commodification and industrialization processes as well as the dissemination and consumption of culture within contemporary social formations, while focusing on one or more sectors of the cultural industries. The analytical approach considers themes such as characteristics of merchandisingcycles, work and market organization, symbolic and cultural specificity of cultural-industries products, and relationships between technological innovation and cultural form.

COMS 843 Communication Policy (3 credits)
This course examines the history and development of state intervention and regulation of the media. It may focus on communication policy nationally or internationally. The course considers such issues as the role of public policy in the development of public media and the public sphere, models of regulation and

deregulation, the relations between regulatory agencies and interest groups, and the position of communication policies within larger governmental structures.

COMS 844 Uses of Information and Communication Technologies (ICTs) (3 credits)
Observing usage of information and communication objects and technical devices allows us to understand the effect of technologies within society. This course explores different theoretical and methodological approaches pertinent to analyzing ICT usages. With respect to course discussions and papers, particular attention may be paid to the interaction between user and technical device; articulation between artifact user and creator; usage situation within the organizational context; embedding of political dimensions in technological design; usage micro-situations and macro-sociological issues. Some major research traditions may be introduced, namely, dissemination of artifacts, sociotechnical innovation, common practices and significations, pragmatic approaches, social and socio-political appropriation of usages.

COMS 882 Communication, Democracy and Power (3 credits)
This course considers the communicative structure and performance of democracy within modern society. Attention is paid to the discursive resources available to perform and affect democracy, the constitution of democratic agents, the role of media in constituting and maintaining a public sphere, communicative strategies, norms of regulation and power, the performance of difference and various aspects of public culture.

COMS 891 Communication Technologies and Society (3 credits)
This course introduces students to and contextualizes the main paradigms with respect to research on social, economic and cultural aspects of information and communication technologies. Critical analysis focuses on their epistemological assumptions and premises, main categories of analysis, and privileged issues. Attention is paid to the political economy of the information system.

Media and Cultural Studies

COMS 842 Media Reception (3 credits)
This course examines media reception. It explores different theoretical and methodological approaches to the study of individual group practices and cultural consumption. The course looks at case-study material drawn from specific media or media genres (e.g. popular music, téléromans, children's programming). The seminar considers such approaches as media ethnography, focus-group research, audience research, life histories, and other context specific micro-social approaches.

COMS 883 History and Historiography of Media and Culture (3 credits)
This course examines the development of communication technologies and the media in comparative and historical perspective. Themes of time, space, place and power and their reconfiguration in relation to media and communication are given particular attention. Class members are encouraged to think about how

they might engage in research on the history of media as part of their dissertation projects. To this end, historiographical issues are examined throughout the course, along with methodological consideration given to how one works with documentary and archival records.

COMS 884 Cultural Theory in Communication Studies (3 credits)
This course introduces students to cultural studies and its entwinement with the development of the field of communications. Key readings in Marxist approaches to culture, British Cultural Studies, and its US and Canadian variants are covered in the first half of the course. The remaining weeks expand the national and conceptual specificity of the "cultural studies tradition". Topics include cultural and representational politics, issues of identity, resistance, hegemony, and ideology.

COMS 885 Popular Culture (3 credits)
This course focuses upon the political dimension of popular culture and the intellectual challenges it poses to scholarship. It concentrates upon the conceptual and historical aspects of the study of popular-cultural forms, their production and consumption, as well as their assessment. The course introduces key ideas and issues in popular-cultural studies, beginning with the rise of interest in mass culture during the late 19th and early 20th centuries. It also encounters modes of examining and understanding popular texts and sites of popular consumption. Issues of subjectivity, community, ideology, cultural hierarchies, and mass society are addressed.

COMS 886 Alternative Media (3 credits)
This course examines the array of alternative communication practices that inform social movements emerging from the margins. It focuses on the conditions of their effectiveness and mechanisms that facilitate or impede their success, such as the external social forces that influence their cooptation, commodification and evacuation of revolutionary potential.

Discourse Studies

COMS 851 Speech Communication (3 credits)
This course examines discourse as action. Forms of discourse considered may range from interpersonal communication to public address. Possible theoretical approaches include ethnomethodology, conversational analysis, rhetorical theory, and performance studies.

COMS 853 Discourse and Representation (3 credits)
The course examines discourse with respect to representation. It focuses upon the structuring of knowledge and identity within sign systems. Emphasis may range from the cognitive and psychological to the social and cultural.

COMS 854 Discourse within Social Formations (3 credits)
This course examines discourse as social mediation. Possible themes include the interrelation of power and knowledge, the organization of culture through signifying practices, and the production of discourse and social institutions.

COMS 887 Strategies and Styles in Communication (3 credits)
This course considers the strategies and styles of communication as intentional symbolic activity. Communication is examined as a practice that responds to and transforms situations and contexts. Emphasis is placed on the form, manner, and consequences of such practices, as well as on the major paradigms informing different approaches to the study of discourse and mediated messages.

COMS 888 Discourses of the Body (3 credits)
Critical theorists have identified the body as a site of competing and multiple discourses. The course examines some of the ways in which different bodies have been constructed in the media and how these both constrain and provide latitude for the expression of identities. A central area of inquiry is the context of the historical and contemporary terrain that informs the expression and categorization of these identities.

Organizational Communication and Networks of Communication

COMS 861 Organizational Culture (3 credits)
This course examines how cultural analysis can be brought to bear in understanding organizational life. To this end, a range of theoretical approaches are drawn upon, including conversational analysis, ethnography, ethnomethodology, symbolic interactionism, enactment theory, and socio-linguistics. Aspects of organizations such as norms, rituals, folklore, traditions, common ideals, ideologies, shared symbols, core values and interaction are given particular attention.

COMS 864 Communication and Change in Organizations (3 credits)
This course addresses a major question within organizations at both theoretical and practical levels. It focuses on issues of innovation or transformation in an organizational framework using various approaches (functionalist, critical, post-modern, constructivist, interpretative). This perspective is pertinent for analyzing the context and process of change within cultural or development organizations as well as private, public or charitable undertakings.

COMS 875 Technology and Organization (3 credits)
This course analyzes and critiques various theoretical approaches which account for the relationship between technology and organization. It also provides the grounds for a communicational reflection on phenomena associated with the presence of information and communication technologies within organizations.

COMS 880 Communication Networks and Organization (3 credits)
This course examines and analyzes communication networks in a constructivist perspective with respect to two main "social-networks" traditions (anthropological and structural). It considers communication networks according to the themes explored by scholars in the field such as diffusion, social support and capital, organizational phenomena, social movements or ICTs. The seminar also includes methodological aspects of the study of communication networks, their emergence, and their transformation.

COMS 889 Theories of Organizational Communication (3 credits)
This course surveys and juxtaposes how some of the main approaches to organizational studies have dealt with issues related to communication. Paradigms considered may include scientific management, human relations, cybernetics, political economy, rational decision making, cultural studies, feminism, and post-modernism. An effort is made to examine how these various approaches emerged historically in relation to shifting patterns of power, inequality, and technological change. Issues such as the nature of bureaucracy, domination and resistance, systematically distorted communication, and public relations/external communication are addressed.

International Communication and Development

COMS 873 Identities and Cultural Exchange (3 credits)
Within the context of electronic, information, and market-globalization forces, traditional geopolitical borders have become porous and easily penetrable. This course focuses on the hybrid identities emergent and negotiated from cross-cultural engagements and transnational communication at the beginning of the 21st century. Curricular materials include theoretical readings, case studies, and audiovisual materials focused on bridging cultural and political gaps.

COMS 874 Globalization of Communication (3 credits)
This course examines the emergence of a global communication system. Possible topics include international information flow, the circulation of communication products and communication issues as they are reflected in international accords and debates, and the role of media in issues of cultural development, democratization, and resistance to globalization.

COMS 877 International Communication and Development (3 credits)
This course traces the history of the different paradigms related to communication and development. It proposes a critical analysis of the theoretical perspectives suggested in both Southern and Northern contexts. The topics considered include Canadian and foreign institutions, policies, and programs, the role of international fora, as well as globalization and development. Case studies may focus on a specific region of the world.

COMS 878 Communication, Conflict and Peace (3 credits)
This course examines the various ways in which discourses of war, conflict, and peace are constructed and relayed through the mass media and other forms of technologically-mediated communication. In particular, how do the inherent properties of different modes of communication intersect with larger discursive formations to reproduce dominant definitions and unquestioned categories of social knowledge related to issues of peace and conflict? What role do the media play in shaping our understanding of war and warfare? How does the internet contribute to promoting both conflict and peace? How is peace represented as an end state that is desirable; for whom is peace being constructed; and what are the kinds of actions being promoted or encouraged in the name of peace?

Media Creation, Design and Practices

COMS 876 Media Technology as Practice (3 credits)
This course examines relationships between theory and practice in the work of individuals and groups of media practitioners across a range of genres and working contexts. Analysis can focus on the organization of the workplace, the creative process and social forces influencing media praxis.

COMS 879 Human-Computer Interactions (3 credits)
This seminar examines human-computer interaction models and research in various fields of media communication; virtual worlds, e-commerce, distance education, sharing of knowledge and resources, adaptive technologies, systems intelligence and customization. Other topics include principles of interface design and assessment in cognitive ergonomics.

COMS 892 Epistemology and Methodology of Media Creation (3 credits)
This seminar seeks to develop a position of poiesis (production) and to differentiate it from the position of aisthesis (reception). In order to define the multiple aspects of media creation, the following themes will be discussed; creationistic accounts and theses; the spectacle as ritual, achievement and imitation of reality; agents, machines and living organisms; functions of transmitting information and story telling. Operational concepts considered include granularity, linearity, interactivity, diegesis, spatialization, indexicalization, enuciation, etc.

COMS 893 Advanced Seminar in Special Topics in the Joint PhD in Communications (3 credits)
This seminar permits the in-depth examination of particular special topics in media and communication. Topics vary from year to year.

Examinations and Research

COMS 805 Research Workshop (3 credits)
This research workshop is supervised by the student's thesis director and is intended to respond to a

particular need unfulfilled by the program. It can take various forms, namely a directed readings program, a specific project within a research group, an elective course (including a masters level course) or a research or creation internship. The research workshop must be defined in a specific agreement between the thesis supervisor and the student, which shall be approved by the program director and added to the student's file. **Note:** Students may re-register for this course provided that the course content, as defined in the specific agreement between the thesis supervisor and the student, has changed. Changes in content are indicated by the letter following the course number, e.g. COMS 805A, COMS 805B, etc.

COMS 810 Doctoral examination (non-credit)

COMS 822 Advanced Seminar in Research Methods I (3 credits)
This course provides an in-depth analysis of methodological problematics. Major contemporary methods of analysis will be considered. Possible themes include research design, data-gathering techniques and instruments, and qualitative or quantitative procedures for data analysis. Specific topics may vary from year to year.

COMS 823 Advanced Seminar in Research Methods II (3 credits)
Students who have registered for COMS 822 will register for COMS 823 when taking a second Advanced Seminar in Research Methods course.

* Topics vary and are determined by the Joint Program Committee.

COMS 830 Doctoral Pro-seminar (6 credits)
COMS 890 Doctoral Thesis Proposal (6 credits)
COMS 896 Doctoral Thesis Research (63 credits)

Master of/Magisteriate in Arts (Media Studies)

Requirements for the Degree

- **Credits.** Fully-qualified candidates are required to complete a minimum of 45 credits, including the three core program courses.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** COMS 600 Communication Theory (3 credits) is required for all students in the first year of the program. Students may enter one of the four options I, II, III or IV outlined below. Students elect an option after their first term of study with permission of the program director. The project option III is restricted to students with adequate and appropriate media experience. The program does not provide media training.

Academic Regulations

- **GPA Requirements.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Normally a student receiving a grade of *C* in two courses will be required to withdraw from the program. Students withdrawing for this reason may petition the MA (Media Studies) Committee for special consideration. In cases of extenuating circumstances, probationary continuation in the program will be considered.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have completed all program requirements and attained a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts with Thesis (Option I)

Candidates are required to take the following:

- 9 credits: COMS 600 - Communication Theory; COMS 605 - Media Research Methods I; COMS 694 - Thesis/Research Creation Project Proposal;
- 3 credits: COMS 610 - Media Studies Seminar;
- 12 credits, chosen in consultation with the student's faculty advisor and approved by the department's graduate studies committee. If approved by the department's graduate studies committee, and with the permission of the department concerned, up to 3 of these credits may be taken in cognate graduate courses offered by other departments in the university;
- 21 credits, COMS 695 - Thesis.

Master of/Magisteriate in Arts with Courses (Option II)

Candidates are required to take the following:

- 6 credits: COMS 600 - Communication Theory; COMS 605 - Media Research Methods I;
- 3 credits: COMS 610 - Media Studies Seminar;

- 36 credits, chosen in consultation with the student's faculty advisor and approved by the department's graduate studies committee. If approved by the department's graduate studies committee, and with the permission of the department concerned, up to 9 of these credits may be taken in cognate graduate courses offered by other departments in the university.

Master of/Magisteriate in Arts with Project (Option III)

Candidates are required to take the following:

- 9 credits: COMS 600 - Communication Theory; COMS 605 - Media Research Methods I; COMS 694 - Thesis/Research Creation Project Proposal;
- 3 credits: COMS 610 - Media Studies Seminar;
- 12 credits, chosen in consultation with the student's faculty advisor and approved by the department's graduate studies committee. If approved by the department's graduate studies committee, and with the permission of the department concerned, up to 3 of these credits may be taken in cognate graduate courses offered by other departments in the university;
- 21 credits, COMS 697 - Project.

Master of/Magisteriate in Arts with Major Research Paper (Option IV)

Candidates are required to take the following:

- 6 credits: COMS 600 - Communication Theory; COMS 605 - Media Research Methods I;
- 3 credits: COMS 610 - Media Studies Seminar;
- 24 credits, chosen in consultation with the student's faculty advisor and approved by the department's graduate studies committee. If approved by the department's graduate studies committee, and with the permission of the department concerned, up to 9 of these credits may be taken in cognate graduate courses offered by other departments in the university;
- 12 credits, COMS 696 - Major Research Paper.

Courses

All courses are worth 3 credits unless otherwise noted.

COMS 600 Communication Theory
This seminar studies and evaluates the major historical and contemporary approaches to communication theory. The following approaches are covered: Processes and Effects, Functionalism; Symbolism and Cultural Studies; Institutional Studies and Political Economy.

COMS 605 Media Research Methods I

Prerequisite: COMS 600 previously or concurrently.

This seminar prepares students to critique literature from any of the major research traditions; to make basic connections between epistemology and problems of basic communication research; to be able to identify the research method most appropriate to personal areas of interest; to design a basic research project.

COMS 606 Media Research Practicum

Prerequisite: COMS 605 and permission of the Graduate Program Director.

This course is an individual research practicum offered on a tutorial basis under faculty supervision. It may be used to develop advanced skills in a particular media research methodology. For students enrolled in the thesis or project options, this course is used to develop the analytic or creative research program necessary to accomplish the thesis or project.

COMS 608 History of Media

Prerequisite: COMS 600 previously or concurrently.

This seminar examines the development of communications technology and the media in a comparative and historical perspective. Topics include the transition from orality to literacy, the print revolution, the rise of new image technologies and the mass press in the nineteenth century, electronic media and the modern nation-state, global information, and the emergence of a world media system.

COMS 610 Media Studies Seminar

This full-year course meets monthly to introduce students to issues of professionalization, careers in Media Studies research and practice, applying for funding, publication and dissemination of research, and presentations of ongoing faculty research and research-creation. An annual December colloquium for the presentation of second-year thesis and research-creation work is held. Required for first-year students, and recommended for continuing students.

COMS 614 News and Public Affairs

This seminar examines the principles and discourses of news and public affairs media. The truth-value of news and public affairs programming is considered in the light of selectivity of reporting, changes in news formats, and the emergence of "infotainment." Topics may include institutional structures, organizational routines, ideologies, and norms of representation that influence the construction of the news.

Note: Students who have received credit for COMS 611, 612 or 655 may not take this course for credit.

COMS 622 Media Law

This seminar examines legislation relevant to the creation and distribution of media products. Topics may include copyright, libel, freedom of expression and censorship, privacy and contracts.

COMS 624 Media Management

The course is designed to provide participants with a practical and theoretical understanding of such aspects of management in the media enterprise as: leadership styles; goal setting; strategic planning; labour relations; ethics; budget control; communications consulting; and effectiveness evaluation. During the course, participants will examine various practices and problems in media management. The course begins with an analysis of management theory and relates to media institutions organizations. In addition, the program provides for advanced study of the social and cultural implications of communications and informations media, and of the analysis of the theory and professional practices of mass media institutions.

COMS 627 Political Economy of Communication

This seminar focuses on issues and problems related to media and cultural industries. Special attention is given to the production and distribution of cultural commodities. Topics for examination include the question of media ownership, the role of state agencies in media systems, and the economics of media institutions.

Note: Students who have received credit for COMS 626 may not take this course for credit.

COMS 628 Organizational Communication

This seminar considers major approaches to organizational communication, particularly as they relate to media enterprises. Various paradigms are considered both as theoretical frames and as forms of social practice that have emerged in relation to shifting patterns of power, inequality, and technological change. Topics may include communication networks, organizational culture, the nature of bureaucracy, systematically distorted communication, gendered communication, the impact of new communication technologies, and patterns of organizational domination and resistance.

COMS 630 Communication, Development, and Colonialism

This seminar focuses on theoretical, and political issues related to interpersonal and mediated communication in developing areas. Topics may include: the forms of colonialism (neo- and post-) cultural domination, participatory development, women and minority constituency groups, sustainable development, and globalization.

COMS 632 Media and Contemporary Culture

This seminar investigates the influence of contemporary media systems on cultural values. Special attention is given to the question of consumption of popular culture and to recent developments in cultural theory. Topics may include: media constructions of nation and identity, media consumption patterns, political culture, popular and entertainment culture.

COMS 634 International Communication

This course explores the manner in which culture, ethnicity and other factors interact and are transformed through the international flow of information, images, and technologies. The international relationship

between media, communication institutions, and constituency groups is considered. Topics may include: the analysis of genres and images, issues of cultural and media imperialism, the global information infrastructure; national sovereignty perspectives, and international broadcasting.

COMS 635 Feminist Theory and Media

This seminar examines concepts and principles from feminist theory in relation to the study of media and communication. Topics may include: theories of gender, sex and sexuality, psychoanalytic theory, materialist cultures, bodies and geographies, technologies, and visual cultures.
Note: Students who have received credit for COMS 642A may not take this course for credit.

COMS 636 Ethics and Media

This seminar examines concepts and principles from ethical theory in relation to the study of media and communication. Possible topics include the ethical implications of media practices, the responsibility of media producers and audiences, the relationship of ethics to the pragmatics of communication, ethics and *ethos*, and the ethical implications of technology.
Note: Students who have received credit for COMS 620 may not take this course for credit.

COMS 640 Directed Study

Students may enrol in a directed study under faculty supervision in order to undertake a specialized study of theoretical or research-related topics. Permission of the Graduate Program Director is required.

COMS 642 Special Topics in Media Studies

This seminar permits the in-depth examination of particular special topics in media and communication. Topics will vary from year to year.

COMS 644 Media Policy

This seminar studies particular sectors of media policy and regulation in Canada. The policy sector under discussion may change from year to year and both historical and contemporary issues will be examined. Topics may include: broadcasting, film, satellite and cable distribution, multiculturalism, northern and remote access, telecommunications, and the internet.

COMS 646 Alternative Media

This seminar explores various alternative and resistant practices to mainstream media, including community radio and television, artists and community video, independent film, underground/pirate media, the internet, and other emergent cultural forms. Topics may include: practices and theories of the alternative, methods of critical analysis, media monopolies, democracy and resistance, cultural imperialism, culture jamming, and the possibilities of new technology-based forms.

COMS 652 The Canadian Documentary
This course examines non-fiction film, television and other media in Canada. Materials considered may include the documentary work of the National Film Board, independent film and video, and television docu-drama. These are examined from a variety of perspectives such as history, form and textuality, institutional analysis, and culture.

COMS 656 Forms and Genres in Communication
This seminar examines specific patterns in cultural forms and texts. Attention is paid to the production, consumption, and textual attributes of genres. Topics vary from year to year, and may include a focus on advertising, public advocacy, documentary, popular music, situation comedy, or feminist feature film.

COMS 660 Definitions and Futures of Media and Technology
This seminar explores the social, cultural, and psychological aspects of media and technology. Media are considered as both containers and expressions of culture. In addition, this seminar focuses on the impacts of new technologies and media. Topics may include the interaction of media and culture, the role of technology in the development of human consciousness and values, and the future of media in the light of emergent technologies and practices.
Note: Students who have received credit for COMS 643 or COMS 658 may not take this course for credit.

COMS 662 Theories of Representation and Interpretation in Communication
This course examines discourse and media texts as forms of representation. Representation is considered in terms of both figure and argument. The course also presents theoretically-informed approaches to the interpretation and criticism of discourses and media texts. Possible theoretical approaches include rhetoric, semiotics, hermeneutics, and speech-act theory.

COMS 670 Directed Study
Students may enrol in a directed study under faculty supervision in order to undertake a specialized study of theoretical or research-related topics. Permission of the Graduate Program Director is required.

COMS 680 Aesthetics and Media
This seminar examines concepts and principles from aesthetic theory in relation to the study of media and communication. In addition to considering general aesthetic principles, the course may focus on particular aural or visual media. Topics may include the relationship of medium to aesthetic form, aesthetics and reception theory, aesthetics and ideology, the mass reproduction and distribution of aesthetic objects, and the aesthetics of new media.

COMS 684 Media Research Laboratory
This production-based seminar explores the intersections of analog, electronic and digital media with a special emphasis on their convergence. Topics may include digital imaging, multimedia information design

and programming, three dimensional media, virtual reality, world-wide-web, hypertext and hypermedia publishing.

COMS 694 Thesis/Research-Creation Project Proposal
Prerequisite: COMS 600, COMS 605, COMS 610, plus 12 elective credits.
Under the direction of a supervisor, the thesis or research-creation project topic and research plan are put into a formal proposal and submitted to a proposal committee and the Graduate Program Director for approval. Proposals must be defended by the end of the third term for students to continue in either the Thesis or Research-Creation Project option.

COMS 695 Thesis (21 credits)
Prerequisite: COMS 694.
The thesis is researched and written in the Fall and Winter of the second year of study. It is submitted in written form and is between 20,000 and 25,000 words in length. All theses are submitted no later than the last day of classes of the Winter term (for Fall convocation). The thesis format must be commensurate with Graduate Studies regulations and in a format stipulated by the rules of the Thesis Office. The thesis is defended in an oral examination.

COMS 696 Major Research Paper (12 credits)
Prerequisite: COMS 600, COMS 605, COMS 610, plus 24 elective credits.
The Major Research Paper is an extended essay/project equivalent to 10,000 words on a topic chosen in consultation with a full-time faculty member. The Major Research Paper may commence from topics and materials from previous courses, it may involve a sustained literature review of a specific issue or problem, or it may be a thematic investigation of a topic pertaining to media or communication studies. With permission of the supervisor and the Graduate Program Director, the Major Research Paper may include a research-creation component. This course is available only to those registered in Option IV, is normally taken in term five, and may not be taken concurrently with other courses.

COMS 697 Research-Creation Project (21 credits)
Prerequisite: COMS 694.
Specifically designed for students with significant media production experience. During the Fall and Winter of the second year of study, students choosing Option III will undertake a Research-Creation Project that deploys one or more media forms. The Research-Creation Project is comprised of an original media production or prototype in any genre, and a 10,000 word document comprising a literature and media review, a theoretical and methodological contextualization, a critical reflection on the project and its outcomes, and other areas of analysis as deemed necessary by the student and the student's Project Committee. The Research Creation Project is submitted no later than the last day of classes of the Winter term (for Fall convocation), and is defended in an oral examination.
Note: Students who have received credit for COMS 696 may not take this course for credit.

Diploma in Communication Studies

Requirements for the Diploma

- **Credits.** Fully-qualified candidates are required to complete a minimum of 33 credits.
- **Courses.** All candidates are required to take 15 credits in core courses, and 18 credits in elective courses chosen in consultation with the Diploma Program Director. Core courses are COMS 505, COMS 506, COMS 562, COMS 569, and COMS 570.

Academic Regulations

- **GPA Requirements.** Students having completed at least four courses are assessed at the end of each academic year based on creditable courses completed after their first registration in the program. To be permitted to continue, students must have obtained a cumulative grade point average of at least 2.70.
- **C Rule.** Normally a student receiving a grade of *C* in two courses will be required to withdraw from the program. Students withdrawing for this reason may petition the Diploma Committee for special consideration. In cases of extenuating circumstances probationary continuation in the program will be considered.
- **F Rule.** Students who receive a failing grade during their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for the Diploma program must be completed within 6 terms (2 years) from the time of initial registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 2.70.

Courses

All courses are 3-credit, one-term courses unless otherwise stated.

Core Courses (Group A)

COMS 505 Definitions of Media and Technology I
This seminar-lecture course situates media and technology in their historical and cultural contexts, in order to examine them as extensions of human perception and work, consider forecast relationships, and explore the epistemics of communication.

COMS 506 Definitions of Media and Technology II
This course is a continuation of COMS 505. It is an exploration of media as symbolic environments or as

"containers" of culture. It provides a grounding for media interpretation through an interdisciplinary approach to the interaction of media and culture, technology and human values, and cross-cultural communication.

COMS 562 Media Production: Sound
This course is designed to provide the student with a basic working knowledge of audio systems, both natural and electronic, to understand the various affective and psychological qualities of sound, and how sound may be structured into imaginative aural form. Lectures and Laboratory: average 6 hours per week.

COMS 569 Media Production: Film and Video
This course provides a foundation in the creative, critical and technical aspects of S-16mm film and digital video production, including non-linear editing using Final Cut Pro. Through collaborative assignments, students discover the shared and distinct language of each medium. Lectures and Laboratory: average 6 hours per week.
Note: Students who have received credit for COMS 567 (Television) or COMS 568 (Film) may not take this course for credit.

COMS 570 Media Production: Intermedia
This course provides an introduction to new and developing digital technologies (primarily computer-based media) through historical, theoretical, and critical perspectives on media, culture, and society and includes basic concepts in software operating systems, communication design and digital media creation. Lectures and Laboratory: average 6 hours per week.

Elective Courses (Group B)

A selection from the following courses will be offered. Information about the particular offerings in a given year is available from the Department.

COMS 507 Advanced Scriptwriting for Media
Prerequisite: Submission of a sample of creative writing by June 30 and subsequent approval by the instructor.
This course provides an in-depth approach to writing for specific media. Emphasis is placed upon structure, story-telling, research, and the interplay of character and action. Different paradigms for both fiction and non-fiction are considered.

COMS 512 Discourses of Dissent
This course examines the forms and tactics of public discourses directed toward social change. Forms of public discourse that may be considered include speech, images, audiovisual works, as well as web-based sites or forms of communication. Emphasis is placed upon political protest, conflict and controversy, and

mobilization. Themes explored include the development of speaking positions, the use of unconventional tactics, and the appropriation or rejection of received values.

COMS 513 Cultures of Production
Drawing on a range of recent field studies exploring the creative workplace (e.g. television production, the fashion industry, ad agencies, graphic design companies, the music business), this course frames commercial cultural production as a site of active agency, negotiation, and constraint through readings, discussion, and the design and execution of field research projects.

COMS 514 Production Administration
This course focuses on the language, skills and strategies necessary for producing media projects and events. Administration, organization, permits and permissions, fundraising, liability and contracts, team building, distribution and writing are just a few of the areas that are examined as students learn the skills necessary to be a producer.

COMS 516 Advanced Topics in Documentary Film and Video
This course provides an in-depth study of selected film and video documentary genres. Specific topics for this course will be stated in the Class Schedule.

COMS 518 Cultures of Globalization
This course examines the significance of communication technologies to the process of globalization, which has increased and accelerated the movement of people and commodities across the world. The resulting transnational networks of cultural, economic, political, and social linkages and alliances are considered, as is the role of media in engendering new forms of community and identity.

COMS 519 Communications and Indigenous Peoples
Focusing on Canadian First Peoples territories in the North and South, as well as selected circumpolar regions, such as parts of Australia and other areas of the world inhabited by indigenous peoples, this course examines from a global perspective the historical, theoretical, and cross-cultural content and contexts of aboriginal media and financing, audience research, product development, distribution issues, and policy formation. Broadcasting, print, and digital media case studies and materials are central components.

COMS 521 Communication Technologies and Gender
Feminist theories of communication technologies are used to critique the impact and meanings of these technologies in various spheres of cultural activity. Topics include the mass media, technological mediations in organizations and institutions, and the re-articulation of domestic and public spaces, such as the Internet and the World Wide Web. Special attention is paid to these electronic and digital technologies - or new media - and the communicational and representational possibilities they enable or foreclose. The class is

conducted as an intensive seminar. Completion of a prior course in women's studies or gender studies at the university level is recommended.

COMS 522 Perspectives on the Information Society
This course critically examines the political, social, and ethical dimensions of the information society within Canada and throughout the world. The development of the information society is placed in a socio-historical context. The significance of information and communication technologies is considered and the role of global information and communication policies is examined.

COMS 523 Media Art and Aesthetics
This course examines the aesthetic principles pertinent to the analysis and creation of works within communication media. Topics may include the field of perception, the role of cognition, the elements of composition, and the interplay of form and meaning. Both the static and dynamic aspects of visual and aural elements are considered.

COMS 524 Alternative Media
This course examines various alternatives to mainstream media. These alternatives may include community radio and video, independent film, the internet, and other emergent cultural forms such as the pastiche and parody of "culture jamming". The concepts of mainstream and alternative are explored and the relationship between alternative media and social practices is considered.

COMS 525 Media Forecast
This course examines trends in film, sound, television, and other media for future applications. The course includes theory of media effects. Representatives from industry and government are invited to discuss future trends in media utilization. The course demands a theoretical and practical model for original or novel use of a medium or media mix.

COMS 532 Communication, Culture and Popular Art
This course offers an advanced examination of popular culture. With attention to such phenomena as hit films and television shows, stars, fans and pop art, this course focuses on the formation of hierarchies of value in cultural forms. This course examines how some cultural products come to be celebrated while others are dismissed. It also considers social and political consequences of divisions of high and low culture.

COMS 533 Semiotics
This course provides a detailed introduction to the semiotics of communication. The course considers the formal characteristics of signs and codes and examines how signs or texts produce meaning. Central to this course is the notion that sign-systems are fundamental to the production of knowledge and ideology. The course proceeds through lectures, an analytical reading of assigned texts, and student discussion and presentations.

COMS 534 Advanced Topics in Film Studies

Note: Students who have received credit for this topic under COMS 517 may not take this course for credit.

COMS 535 Communications, Development and Colonialism

This course discusses the role media can play in indigenous and international development. The concept of development communications is examined in the context of debates within neo-colonial and post-colonial theories.

COMS 537 Race, Ethnicity and Media

This course addresses practical and theoretical issues of race and ethnicity that have become focal points for current debates in public cultural expression and media studies. The following themes are discussed: cultural/racial difference and its implications for media studies; the (mis)representation of multicultural and multiracial minorities in mainstream and alternative media; questions of access to arts and other cultural funding sources; implications of employment equity legislation in light of media budget cuts; and cross-cultural awareness programs vs. anti-racist training for media professionals. Theoretical readings which frame issues of cultural and racial representation are an integral part of this course.

COMS 538 Organizational Communication

This course considers major approaches to organizational communication in relation to shifting patterns of power, inequality and technological change. Topics include communication networks, organization culture, bureaucracy, systematically distorted communication, gendered communication, the impact of new communication technologies, and patterns of organizational dominance and resistance. Case studies of particular organizations are examined.

COMS 539 Political Communication

The relationships between forms of communication and political structures and processes are examined. Topics include freedom of expression, the role of communication in mediating conflict, the place of deliberation and debate in democracy, political campaigns and advertising, and the relationship between styles of communication and models of governance.

COMS 540 Acoustic Communication and Design

This course investigates contemporary theories of acoustic communication and design, such as Attali's concept of noise, Schaeffer's theory of the sound object, Schafer's concept of soundscape, Chion's cinema for the ear, and Augoyard's repertoire of sound effects. Students engage in critical analysis of selected sound texts from various media.

COMS 541 Sexuality and Public Discourse

This course analyzes and explores the ways sexuality circulates in, and as, public discourses. Through a variety of conceptual formations and critical conceptualizations of 'the public' and 'sexuality', this course

analyzes conceptually and critically how sexuality and the notion of the public are mutually constitutive. The seminar is interdisciplinary and draws upon works in feminist studies, queer theory, political philosophy, history, cultural studies and communication theory.

COMS 542 Advanced Topics in the Photographic Image
This course explores the themes and concerns associated with particular photographic practices. Through class discussion, visual materials, readings and writing projects, students develop a critical understanding of the history, language and aesthetics of the photographic image.

COMS 543 Film Criticism
This course provides an introduction to the assumptions, methodologies, and vocabularies implicit in important schools of popular and academic film criticism.

COMS 544 Reception Studies
This course examines recent theory and research trends in the area of media reception studies and audience agency. Topics may include discursive, institutional, observational and ethnographic approaches through readings, discussion, and the design and execution of field research projects.

COMS 545 Television Studies
This course examines recent research focusing on television. Topics may include technological and industrial changes, audience activity, new genres, and representational conventions.

COMS 546 Rhetoric and Communication
This course focuses upon communication as persuasive or as producing identification. Emphasis is placed upon the role of communication in civic affairs. Classical and contemporary approaches to rhetorical theory and criticism are examined.
Note: Students who have received credit for this topic under a COMS 530 number may not take this course for credit.

COMS 547 International Communication
This course explores historical and current parameters of international communications within the context of current global shifts in power/knowledge relations. Discussion topics are selected from among the following: key development and neo-colonial theories, cultural/media imperialism, globalization, the UN infrastructure, the Right to Communicate debates, national sovereignty issues, international broadcasting, cross-cultural audience reception research and effects theories, telediplomacy, the World Wide Web and the Internet, women as an international constituency group, and others.

COMS 548 Media Policy in Canada
This course acquaints the student with the historical development of media policy in Canada. It examines

the government regulation of media as well as the strategies that have been put in place to foster and guide the development of media and cultural industries. It also considers the present state of broadcasting, telecommunications and internet policies in Canada, focusing on current problems and exploring alternative solutions.

COMS 553 Communication Ethics
This course allows students to confront issues of creative responsibility and ethical dilemmas in media practice. Emphasis is placed upon the relationship between production and theory at the level of ethical responsibility. Specific issues include ethical theories as applied to media, communication and information; the relationship of human values and technologies of information reproduction; the possibilities of critical media practice; identification of challenges emerging from experience in Communication Studies.

COMS 561 Communicative Performances and Interventions
This course examines how media can be used in order to intervene in social and cultural issues. Emphasis is placed on the performative character of interventions: they occur at a particular time and in a particular place, they are addressed to and seek to move particular audiences. Topics may include the history of performance strategies, the social and political character of aesthetic interventions, and the forms of such performances in relation to various media of communication.

COMS 580 Selected Topics in Communication Studies

COMS 583 Internship in Communication Studies
This course makes it possible for students to observe, study and work in the communications media field of their choice under the supervision of a Communication Studies faculty member and a media professional in the field. Permission of the Graduate Program Director is required.
Note: There is no remuneration for students participating in internships, which involve 120 hours on site.

COMS 585 Directed Study in Communication Studies
This course may be repeated as COMS 586.
Students may enrol in a directed study under faculty supervision in order to undertake a specialized study of research-related topics. Permission of the Graduate Program Director is required.

COMS 586 Directed Study in Communication Studies
Prerequisite: COMS 585.
Students may enrol in a directed study under faculty supervision in order to undertake a specialized study of research-related topics. Permission of the Graduate Program Director is required.

COMS 598 Advanced Topics in Communication Studies

Economics

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Economics Website

Doctor of/Doctorate in Philosophy (Economics)
Master of/Magisteriate in Arts (Economics)
Diploma in Economics

Doctor of/Doctorate in Philosophy (Economics)

Admission Requirements. A Master of/Magisteriate in Arts in Economics from a recognized university with a cumulative GPA of 3.50 or equivalent. Students with a high standing in a master's degree or equivalent in other fields, such as commerce, mathematics or business administration from a recognized university may be admitted, subject to satisfactory completion of qualifying requirements, if necessary. Students with a BA (honours) or equivalent with high standing in economics may apply for admission directly to doctoral studies.

TOEFL Requirement. The Department of Economics recommends students for admission with TOEFL iBT total scores of at least 90 (or 577 for TOEFL PBT). The following scores in the essay/written expression section are also required: TOEFL iBT, 23 (TOEFL PBT, 5.0).

GRE. While writing the GRE is not required, such scores certainly enhance an application for admission and especially for funding.

Requirements for the Degree

- **Credits.** A fully-qualified candidate entering the program with a master's degree is required to complete a minimum of 90 credits.
- **Residence.** The minimum period of residence is two calendar years (6 terms) of full-time graduate study beyond the master's degree, or three calendar years (9 terms) of full-time graduate study beyond the bachelor's degree for those permitted to enrol for doctoral studies without completing a master's degree. A period of full-time study, allowed or required by the Department to be spent at another institution with adequate research facilities, may be offered towards partial fulfillment of the residence requirements for the degree of PhD at Concordia University. In each case, the Department must obtain approval of the Council of Graduate Studies.

- **Courses.** All PhD candidates must take seven one-term graduate courses (21 credits) selected from the Departmental offerings, three of which must be ECON 613: Microeconomics II, ECON 616: Macroeconomics II and ECON 681: Econometric Theory II, plus four program electives. Students entering the doctoral program directly with an honours bachelor's degree must complete ECON 612: Microeconomics I, ECON 613: Microeconomics II, 615: Macroeconomics I, ECON 616: Macroeconomics II, ECON 680: Econometric Theory I, ECON 681 Econometric Theory II, plus 7 one-term graduate courses. A recognition of past graduate work as partial fulfillment of the course requirements for the PhD degree is at the discretion, and subject to the approval of, the Graduate Program Director and the Dean of Graduate Studies. (See the regulation concerning transfer credits in this calendar.)
- **Research Seminar.** All candidates must take ECON 806: Doctoral Research Seminar (6 credits) requiring the presentation of a paper. This seminar is intended to aid in the development of a doctoral thesis proposal.
- **Comprehensive Examinations.** All candidates must pass three examinations (6 credits) in the areas of: Microeconomic Theory, Macroeconomic Theory and Econometrics. Each of these examinations is set, read and marked by members of the Department. These examinations must be passed before a student enrols in ECON 806.
- **Fields of Specialization.** Each PhD student must have 2 fields of specialization, either as part of the degree of MA or within the students' PhD program. In order to do this the student must successfully complete 2 courses from the sequences offered in any of the following fields: Economic Development; Financial Economics; Industrial Economics, International Economics; Labour Economics; Public Economics; or 3 courses in one of Econometrics, Macroeconomics or Microeconomics.
- **Language Requirement.** PhD candidates must pass an examination in French. International students may, with the approval of the Department, replace French with another language in which there exists a sufficiently large economics literature.
- **Thesis.** A candidate who has passed the PhD comprehensive examinations must submit in writing to the Graduate Program Director a detailed proposal of a thesis topic. Candidates proceed to work on the thesis (57 credits) only after obtaining approval of the topic from both the Graduate Studies Committee in the Department and the thesis supervisor.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored periodically. To be permitted to continue in the program, a student must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

- **C Rule.** Students who obtain less than a grade of *B-* in a course are required to repeat the course or take another course. Students receiving more than one *C* grade will be withdrawn from the program.
- **F Rule.** A student who receives a failing grade in the course of a PhD program will be withdrawn from the program. Students may apply for re-admission. A student who receives another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for the degree of PhD must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of initial registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts (Economics)

Admission Requirements. An honours degree in economics, from a recognized university, or the equivalent, with a cumulative GPA of 3.00 is required. An applicant may be required to take up to 12 prerequisite undergraduate credits in addition to, but as part of, the regular graduate program. Some applicants may be required to pass a qualifying program, as a condition for entry into the regular MA program.

TOEFL Requirement. The Department of Economics recommends students for admission with TOEFL iBT total scores of at least 90 (or 577 for TOEFL PBT). The following scores in the essay/written expression section are also required: TOEFL iBT, 23 (TOEFL PBT, 5.0).

The Economics Co-operative Program is offered to those enrolled in an MA Program in Economics. The academic content of the Co-operative Program is identical to that of the regular program, but three Study Terms are interspersed with two Work Terms. Students are supervised personally and must meet requirements specified by the Faculty of Arts and Science, the School of Graduate Studies and the Institute for Co-operative Education. As employment opportunities primarily exist in the Canadian public sector, the program is presently restricted to Canadian citizens.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** A fully-qualified candidate is required to take three 3-credit courses Microeconomics I (ECON 612), Macroeconomics I (ECON 615) and Econometrics I (ECON 680) and five additional 3-credit courses selected in consultation with the Graduate Program Director.
- **Research Paper.** Each student must write a research paper (ECON 703, 21 credits) demonstrating an application of knowledge in a particular area of economics. The topic of the research paper must be

approved by the Graduate Program Director and a full-time member of the Department who is prepared to act as supervisor. The research paper is prepared under the guidance of the supervisor who must approve and recommend the final version for examination by an independent member of the Department appointed by the Graduate Program Director.

- **Fields of Specialization.** Each MA student is required to complete one field of specialization by successfully completing 2 courses from the sequences offered in any of the following areas: Econometrics, Economic Development; Financial Economics; Industrial Economics; International Economics; Labour Economics; Macroeconomics; Microeconomics; Public Economics.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored periodically. To be permitted to continue in the program, a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits, is required. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students in master's programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for the degree of MA by full-time study must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, a student must have a cumulative GPA of at least 3.00.

Courses

Graduate courses offered by the Department of Economics fall into the following categories:

ECON 610-619 Economic Theory
ECON 620-629 Economic Development and Planning
ECON 640-645 Financial Economics
ECON 656-658 Public Economics
ECON 660-669 International Economics
ECON 670-674 Industrial Economics
ECON 675-679 Labour Economics

ECON 680-689 Econometrics
ECON 690-693 Mathematical Economics

Elective Courses

A selection from the following courses will be offered each year. Information about the particular offerings in a given year is available from the Department. All courses are one-term, 3 credit courses.

Economic Theory

ECON 612 Microeconomics I
Prerequisite: ECON 501 and 525; or equivalent.
This course is devoted to modern consumer and producer theories. Consumer theory is presented first, and at some length, due to its inherent importance, as well as the overlap between the methods and results in this area and in producer theory. Producer theory is dealt with next. In this section of the course, the similarities and differences between these two important building blocks of modern microeconomics are emphasized.

ECON 613 Microeconomics II
Prerequisites: ECON 612 and 614.
This course covers a number of topics in microeconomic theory. Main topics include general equilibrium theory and welfare economics, topics in the theory of information, contracts and principal-agent problems, and selected topics in game theory.

ECON 614 Game Theory
Prerequisite: ECON 612.
This course offers an in-depth coverage of some important topics in mostly non-cooperative but also cooperative game theory. Although formal reasoning, precise definitions and proofs are part of the course, emphasis is placed on the importance and use of the various concepts in economics. Main topics include Nash equilibrium and subgame perfection, correlated equilibria, rationalizability, zero sum games, repeated games, (perfect) Bayesian Nash equilibrium, core Shapley value, bargaining problems, and stable sets.

ECON 615 Macroeconomics I
Prerequisites: ECON 503 and 525; or equivalent.
The objective of this course is to introduce students to advanced theories and mathematical tools for rigorous analysis of various macroeconomic issues. Topics covered include consumption, investment, inflation and economic growth theories including Solow, Ramsey-Cass-Koopmans, and endogenous growth models.

ECON 616 Macroeconomics II

Prerequisite: ECON 615.

This course studies various issues in macroeconomic theory within a dynamic general equilibrium framework. Topics covered vary from year to year. However, the first part of the course is usually an initiation into useful techniques such as dynamic programming and the numerical methods.

ECON 618 Monetary Economics

Prerequisite: ECON 615.

This course includes the theory of money, monetary policy, payment systems, and banking. Among the available models, there will be a particular focus on the *New Keynesian* model as a framework to analyze monetary policy. Alternative models of money, such as search-theoretic models, are also studied.

ECON 619 Political Economy

Prerequisites: ECON 614 and 615.

This course studies how conflicts of interest are resolved through political institutions in democratic countries. In the first half of the course, tools and models that are useful in the analysis of voting and elections, bargaining in legislatures, and special interest politics are studied. In the second half, these tools are applied to examine: (1) how macroeconomic polices are made through the political process; (2) why inefficient policies may be chosen in the end; and (3) how constitutions (indirectly) shape public policy and consequently the economic outcomes of nations.

Economic Development and Planning

ECON 620 Development Planning I

Prerequisites: ECON 501, 503 and ECON 525; or equivalent.

This course deals with the main consistency models used in development planning. Aggregate macro-models, extensions of two-gap models and multisectoral consistency models are studied in detail. On the basis of case studies, special attention is given to the building of such models, to their limitations for policy users and to their possible improvement in the case of limited statistical information.

ECON 621 Development Planning II

Prerequisites: ECON 501, 503 and 525; or equivalent.

The main purpose of this course is the study of aggregate and disaggregate optimization models applied to development planning. The theoretical discussions are complemented with the use of these models to study different policy issues.

ECON 622 Economic Development

Prerequisites: ECON 501, 503 and 525; or equivalent.

Modern theories of economic development are presented. Topics include microeconomic reform and

transition in developing economies, income inequality and enterprise and, foreign investment and technology flows as a means to development. In addition, analytical techniques used in the study of structure and functioning of developing economies are presented.

ECON 623 Growth and Development

Prerequisites: ECON 501, 503 and 525; or equivalent.

This course examines a series of models that are relevant to the study of economic growth and development. These two issues are studied from a macroeconomic perspective; that is, emphasis is placed on highly stylized models characterized by rational decision making within a dynamic environment.

ECON 624 Topics in Economic Development

Prerequisites: ECON 501, 503 and 525; or equivalent.

Why are some countries poor and others rich? What can account for cross-country differences in fertility and mortality rates? In gender gaps, civil war, and school attainment? Why did the industrial revolution start in Europe? Why did Europe colonize the rest of the world, rather than the other way around? Why are some former colonies (e.g., U.S., Canada) so much richer than others (e.g., India and Zimbabwe)? This course presents research which addresses these issues. While emphasis in on theoretical research where overlapping-generations models are used to generate multiple steady-state equilibria, empirical work is also examined.

Financial Economics

ECON 642 Financial Economics I

Prerequisites: ECON 501, 503 and 525; or equivalent.

This course is the first of a two course sequence in financial economics, and is intended to provide an introduction to contemporary theoretical and empirical modeling in financial markets. The course provides a foundation for more advanced work in financial economics while allowing students without an exceptionally strong mathematical background to become familiar with the discipline. Theoretical topics include measures of risk aversion, stochastic dominance, individual portfolio choice under uncertainty, the capital asset pricing model (CAPM), and the arbitrage pricing theory (APT). Empirical topics include tests of CAPM and the APT, the efficient markets hypothesis, performance evaluation, and event test methodology.

ECON 643 Financial Economics II

Prerequisites: ECON 642 and 680.

This course is the second of a two course sequence in financial economics, and is intended to provide an introduction to several advanced topics in theoretical and empirical financial economics. Theoretical topics include the valuation of state contingent securities, dynamic asset pricing, and continuous time methods. Empirical topics include the time-series properties of returns, traditional structural estimation of asset

pricing models of maximum-likelihood (ML) and the generalized method-of-moments (GMM), calibration and simulation, variance bounds tests, and an introduction to empirical methods for continuous time models.

Public Economics

ECON 656 Public Finance: Expenditure
Prerequisites: ECON 501 and 525; or equivalent.
This course deals with welfare economics and the role of the government in supplying goods. The principal topics are the optimal supply of public goods, voting mechanisms and models of preference revelation, consumer's surplus, externalities in production and consumption, optimal pricing models, the theory of clubs, inequality, cost-benefit analysis, federalism and federal-provincial relations in Canada.

ECON 657 Public Finance: Taxation
Prerequisites: ECON 501 525; or equivalent.
This course analyzes both the descriptive and normative effects of alternative taxation policies on economic behaviour. In the descriptive part it deals with work-leisure choice, saving decisions and the incidence of the corporation income tax. The normative part deals with the optimality issues of income and commodity taxation. Emphasis is given to both analytical and policy considerations.

ECON 658 Environmental Economics
Prerequisites: ECON 501, 525; or equivalent.
This course deals with the inter-relationship between economics and the physical environment. The objective is to depict the problem of environmental quality as an economic problem. The course focuses on the use of concepts and instruments derived from public finance for the resolution of environmental issues. Numerous case studies are discussed.

International Economics

ECON 661 International Trade
Prerequisites: ECON 501, 525; or equivalent.
This course provides a systematic treatment of neo-classical international trade theory, including the theory of comparative advantage, the theory and practice of commercial policy, trade and welfare, and customs union theory. The course emphasizes the interaction of trade theory with policy questions.

ECON 662 International Monetary Economics
Prerequisites: ECON 501, 503 and 525; or equivalent.
This course deals with the specific issues resulting from balance of payments and exchange rates adjustments for open economies. Topics covered in this field include monetary and fiscal policies for external and internal balance, the international transmission of disturbances and adjustments mechanisms,

the current account, international capital flows, the foreign exchange markets and the international monetary system.

Industrial Economics

ECON 673 Industrial Organization
Prerequisites: ECON 501, 525; or equivalent.
This course surveys economic models of industrial behaviour. Topics covered include theories of oligopoly, effects of potential entry, product differentiation, advertising, technological change, vertical integration, monopoly and merger issues.

ECON 674 Economics of Regulation
Prerequisites: ECON 501, 525; or equivalent.
This course examines economic theories of regulation as applied to monopolized and competitive industries, together with their policy implications. Topics covered include natural monopoly, contestable markets, effects of "traditional" regulation (such as rate of return and Ramsey pricing), together with an examination of recent theories of optimal regulation under asymmetric information. Topics in the regulation of industries include minimum quality standards, licensing, and predatory business practices.

Labour Economics

ECON 677 Labour Economics I
Prerequisites: ECON 501, 525; or equivalent.
This course covers selected topics in the field of labour economics. The focus of the course is on microeconomic analyses and issues. The emphasis is on the application of some of the ideas from the theories of information, uncertainty, and incentives to the understanding of labour markets and institutions. Topics covered include wage and wage differentials, discrimination, human capital, life-cycle models of labour markets, effects of asymmetric information, self-enforcing implicit contracts, efficiency wage models, principal-agent problems, team production and tournaments.

ECON 678 Labour Economics II
Prerequisites: ECON 612 and ECON 680.
The main objective of this course is to examine a relatively small number of topics in modern labour economics and, ultimately, their empirical and econometric application. The topics covered include static and dynamic models of labour supply, dynamic models of job search and job matching, econometric analysis of labour market transition data, unemployment insurance, and unemployment theories.

Econometrics

ECON 680 Econometric Theory I

Prerequisites: ECON 521 and 525; or equivalent.

The general aim of this course is to discuss some of the fundamental methods of econometrics and their theoretical justification. The course begins with a mathematical and statistical review and moves on to a thorough discussion of the general theory of least squares (including instrumental variables) and maximum-likelihood, their justification and associated tests of significance. Applications include linear, single-equation and simultaneous equations models, some non-linear models, and specification analysis. Students are expected to undertake various exercises, including computer-based applications.

ECON 681 Econometric Theory II

Prerequisite: ECON 680.

This course covers advanced topics in estimation and inference in non-linear econometric models including asymptotic theory, generalized method of moments, quasi-maximum likelihood, simulation based methods, non-parametric and semiparametric estimation, bootstrap methods and robust estimators.

ECON 682 Applied Econometrics: Time-Series

Prerequisite: ECON 680.

This course provides an introduction to statistical techniques for analyzing time-series data. Topics include Box-Jenkins methodology, spectral analysis, forecasting, tests for unit roots, multivariate time-series analysis: vector autoregressions, causality, co-integration, and nonlinear time-series models such as ARCH models.

ECON 683 Applied Econometrics: Microeconometrics

Prerequisites: ECON 680 or equivalent, and one successfully completed graduate level course in econometrics, or permission of the instructor.

This course provides an introduction to statistical techniques and practical aspects of microeconometric analysis. Topics include binary response models, censored and truncated regression models, analysis of categorical survey data, instrumental variables, treatment effects, panel data models with fixed and random effects, analysis of transition data, estimation by simulation, and estimation of dynamic programming models.

Mathematical Economics

ECON 690 Mathematical Economics

Research, Theses, and Preliminary Examinations

ECON 694 Reading Courses in Economics
With the permission of the Graduate Studies Committee a supervised reading course in a specialized area in which no course is offered by the Department.

ECON 695 Seminar in a Special Topic
Recent Special Topics have included: ECON 695C: Monetary Economics; ECON 695D: Game Theory; ECON 695E: Workshop in Advanced Economic Theory; ECON 695G: Applied Industrial Organization; ECON 695H: Empirical Trade; ECON 695J: Political Economics; ECON 695K: Natural Resources and Environmental Economics Workshop.

ECON 703 Master's Research Paper (21 credits)
ECON 805 Doctoral Comprehensive Examination (6 credits)
ECON 806 Doctoral Research Seminar (6 credits)
ECON 807 Doctoral Thesis (57 credits)

ECON 814 Workshop in Advanced Economic Theory
Prerequisite: Permission of the department.
The workshop is designed for PhD students who have successfully completed their comprehensive examinations and have expressed an interest in Economic Theory. The course involves lectures by participating faculty members and continues with presentations by students. These presentations may involve the student's own work or an already published paper of great importance to the literature. Topics vary from year to year, with some years devoted to micro-topics and others to macro-topics.
Note: Students who have received credit for this course under ECON 614 may not take this course for credit.

ECON 817 Advanced Macro Theory
Prerequisite: ECON 616.
The course deals with the New Classical and *New Keynesian* macroeconomics, rational expectations and disequilibrium approaches. Emphasis is placed on model solution techniques, optimal control theory, and stochastic processes. Recent developments in empirical estimation will also be dealt with.
Note: Students who have received credit for ECON 617 may not take this course for credit.

ECON 858 Montreal Natural Resources and Environmental Economics Workshop
Prerequisite: Permission of the department.
This workshop, which is organized through the *Centre Interuniversitaire de Recherche en Economie Quantiative* (CIREQ), is intended for researchers and doctoral students in economics throughout Montreal who are interested in resource and environmental economics. The types of topics that may be dealt with, at an advanced level, are the economic theory of sustainable growth, green accounting, sunk costs and production constraints in natural resource exploitation, the irreversibility of environmental investment decisions, measures of biodiversity and their implications, the optimal order of extraction of natural

resources, intertemporal depletion of spatially distributed nonrenewable resources, property rights and natural resource exploitation, applications of differential games to natural resource and environmental economics, and other related topics. The workshop is led by a team of researchers comprising professors from McGill University, Concordia University, Université de Montréal and HEC Montréal who will actively participate in each meeting. A regular and active participation is expected of the doctoral students and other researchers who would like to join this work group.

ECON 878 Workshop in Labour Economics
Prerequisite: Permission of the department.
The course covers topics related to specifying and estimating static and dynamic models of individual choice concerning education, occupation, labour supply, marriage, fertility, and immigration. Emphasis is placed on policy evaluation methods. The course covers both structural and nonstructural approaches. For each topic, theory, econometrics and applications are discussed. The course concludes with presentations by students of their on-going thesis work. The course is restricted to PhD students who plan to write a thesis in the field of labour economics. There is no textbook for this course. Instead, the course uses journal articles extensively to supplement the topics covered in the workshop.

Cognate Courses

In addition, graduate students in economics may be permitted to register for a limited number of courses offered in the MSc program in the John Molson School of Business. In all such cases, prior permission of the Department of Economics and the John Molson School of Business is required.

Diploma in Economics

Admission Requirements. To be considered for admission, applicants must hold an undergraduate degree with a cumulative GPA of 3.00 or the equivalent. In addition, they must have earned sufficient credits in economics and basic statistical and mathematical methods to cope with graduate level courses in economics. In exceptional cases, and at the discretion of the Graduate Program Director, an applicant who has not yet satisfied this Arts and Science prerequisite may be admitted, providing that the missing courses are included in the student's program in addition to the normal course requirements for the diploma. The grading scheme for diploma courses will be the scheme applicable to graduate courses (i.e., the passing grade is *B-*).

TOEFL Requirement. The Department of Economics recommends students for admission with TOEFL iBT total scores of at least 90 (or 577 for TOEFL PBT). The following scores in the essay/written expression section are also required: TOEFL iBT, 23 (TOEFL PBT, 5.0).

Requirements for the Diploma

- **Credits.** Candidates are required to complete a minimum of 30 credits. No more than 12 credits can be earned as pro-tanto credit for previous work.
- **Courses.** Credit courses for the diploma program are listed below. Up to 6 credits may be earned in the category of cognate courses (see Class C). Each student's program of study must be approved by the Graduate Program Director.

Academic Regulations

- **GPA Requirement.** Students having completed at least four courses are assessed at the end of each academic year based on creditable courses completed after their first registration in the program. To be permitted to continue, students must have obtained a cumulative grade point average of at least 2.70.
- **C Rule.** Normally a student receiving a grade of *C* in two courses will be required to withdraw from the program. Students withdrawing for this reason may petition the Diploma Committee for special consideration. In cases of extenuating circumstances probationary continuation in the program will be considered.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a diploma program must be completed within 6 terms (2 years) from the time of initial registration in the program for full-time students; for part-time students the time limit is 12 terms (4 years).
- **Graduation Requirement.** To graduate, students must have completed all course requirements with a cumulative grade point average of at least 2.70.

Courses

ECON 501 and 503 are compulsory core courses for all students. A minimum of six credits must be taken from Class B. The remaining credits may be selected from Class A and/or Class B and/or Class C with no more than six credits taken from Class C.

Class A Courses (3 credits each)
The 500 level courses have a 3 credit value and are cross-listed with the undergraduate 400 level courses.

ECON 501 Advanced Microeconomic Theory
ECON 503 Advanced Macroeconomic Theory
ECON 509 History of Economic Thought I
ECON 510 History of Economic Thought II
ECON 513 Economic Growth and Fluctuations

ECON 514 Economic Development: Policy Analysis
ECON 521 Econometrics I
ECON 522 Econometrics II
ECON 523 Applied Econometrics
ECON 525 Mathematics for Advanced Study in Economics
ECON 532 Advanced Monetary Theory
ECON 533 Financial Economics
ECON 536 Economics of Taxation
ECON 537 Economics of Public Expenditure
ECON 542 International Economics: Trade Theory
ECON 543 International Economics: Finance
ECON 561 Industrial Organization
ECON 562 The Corporate Economy
ECON 563 Economics of Regulation
ECON 564 Game Theory, Information, and Economic Modelling
ECON 565 The Economics of Professional Sport
ECON 581 Advanced Labour Economics I
ECON 582 Economics of Personnel and Industrial Relations
ECON 583 Advanced Labour Economics II
ECON 585 Health Economics
ECON 591 Advanced Environmental Economics
ECON 593 Regional Economics
ECON 595 Economics of Transportation and Communications
ECON 597 Income Distribution and Economic Inequality
ECON 598 Advanced Topics in Economics
ECON 599 Advanced Topics in Economics

Class B Courses (3 credits each)
All 600 level courses offered in the Department of Economics.

Class C Courses (3 credits each)
All master level courses in the John Molson School of Business.

Education

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Education Website

Doctor of/Doctorate in Philosophy (Education)
Master of/Magisteriate in Arts (Educational Technology)
Diploma in Instructional Technology
Master of/Magisteriate in Arts (Educational Studies)
Diploma in Adult Education
Master of/Magisteriate in Arts (Child Studies)
Master of/Magisteriate in Arts (Applied Linguistics)

Note: The PhD in Educational Technology is now offered as an option in the new PhD in Education; please refer to the program description below.

Doctor of/Doctorate in Philosophy (Education)

Admission Requirements. The normal requirement for admission is a Master of Arts degree in Education, Applied Linguistics, Child Studies, Educational Studies, or Educational Technology, with high standing, from an accredited university. Applicants with a Master's degree (or equivalent) in a related field or discipline, such as psychology, sociology, anthropology, etc, will be considered. Students lacking the necessary background in Education or in their area of specialization may be required to take prerequisite courses including methodology, learning theories and foundation courses (up to 15 credits).

Language Requirement. For students whose first language is neither English or French, a test of English language proficiency is required prior to admission. To fulfill this requirement, the student must provide one of the following: 1) TOEFL iBT results of 90+; 2) TOEFL PBT result of 577+ with a writing score of 5.0+; 3) an IELTS score of 7+; or, 4) proof that the student has achieved the level of Concordia's English 212 course (testing is available through Concordia University's English Department—please contact that Department for further details).

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 90 credits.

- **Residence.** The minimum period of residence is two years (6 terms) of full-time study beyond the master's degree, or the equivalent in part-time study. A minimum of one year of full-time study is highly recommended.
- **Orientation.** Each candidate will be assigned an interim research supervisor and a supervisory committee. This interim supervisory committee will consist of three members of the faculty, including the research supervisor. This supervisory committee will advise the student as to which courses should be taken, including prerequisite courses where necessary (to be determined no later than the first two weeks of the student's first term), and will arrange for the comprehensive examination. At this time the membership of the student's advisory committee may change.
- **Courses.** Each candidate is required to complete the following:
    - EDUC 800 and 801 – Research Seminar I and II (3 credits each). Students will register for EDUC 800 in their first year and for EDUC 801 in their second year. In succeeding years all candidates will be expected to attend and participate in these seminars on a non-credit basis.
    - EDUC 802 – Intermediate Quantitative and Qualitative Methods (6 credits)
    - EDUC 803 – Advanced Quantitative Methods (3 credits) OR EDUC 804 – Advanced Qualitative Methods (3 credits)
    - EDUC 805 – Advanced Learning and Cognition: Disciplinary Perspectives (3 credits)
    - 12 credits of elective courses, three credits of which must be taken outside the student's area of specialization.
    - EDUC 890 – Comprehensive Examination (6 credits)
      Each candidate must successfully complete EDUC 890 before being admitted to candidacy for the degree. The comprehensive consists of a written and oral examination that will test the candidate on both general and area specific research. After successfully completing the comprehensive examination, the student is admitted to candidacy for the degree.
    - EDUC 891 – Doctoral Proposal (6 credits)
      Note: the proposal will be accepted only after the student has been admitted to candidacy.
    - EDUC 895 – Doctoral Dissertation (48 credits).
      A doctoral thesis is expected to make an original contribution to knowledge, and be presented in acceptable literary form.

Academic Regulations

- **GPA Requirements.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

- **C Rule.** Students who receive a "C" grade in the course of their doctoral studies (including any pre- or co-requisite graduate courses) will be withdrawn from the program, unless continuation in the program is requested by the student's program and approved by the School of Graduate Studies. If allowed to continue, the student must either repeat the course or register for an acceptable substitute approved by the Graduate Program Director. Students who have been withdrawn may apply for re-admission.
- **F Rule.** Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the School of Graduate Studies. Students who have been withdrawn may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of initial registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Required Courses

Each course is worth 3 credits unless otherwise indicated.

EDUC 800 Research Seminar I (Year 1)
EDUC 801 Research Seminar II (Year 2)
EDUC 802 Intermediate Quantitative and Qualitative Methods (6 credits)
Prerequisite: ETEC 648 or CHST 607 or equivalent.
EDUC 803 Advanced Quantitative Methods
Prerequisite: EDUC 802.
or
EDUC 804 Advanced Qualitative Methods
Prerequisite: EDUC 802.
EDUC 805 Advanced Learning and Cognition: Disciplinary Perspectives
EDUC 890 Comprehensive Examination (6 credits)
EDUC 891 Doctoral Proposal (6 credits)
EDUC 895 Doctoral Dissertation (48 credits)

Area Tutorials

The content and format of an area tutorial may vary from year to year, depending on the number of students and the availability of faculty members. All area tutorials involve directed reading, research, seminar presentations, and discussion sessions on selected topics within that problem area.

Area tutorials offered by the Department of Education fall into the following categories:

EDUC 810-824 Educational Technology Area Tutorials
EDUC 825-839 Child Study Area Tutorials
EDUC 840-854 Educational Studies Area Tutorials
EDUC 855-869 Applied Linguistics Area Tutorials

Each course is worth 3 credits unless otherwise indicated.

EDUC 810-824 Educational Technology Area Tutorials
Area tutorials in Educational Technology are selected from topics related to the application of technology to education and training. These include Human Performance Technology (HPT); theory, development and research in educational media; distance education; educational cybernetics, systems analysis and design; and human resources development.

EDUC 825-839 Child Study Area Tutorials
Area tutorials in Child Study are selected from topics that focus on children's typical and atypical learning and development (e.g., social or cognitive development, physical activity, health and well-being), in a variety of settings and contexts (e.g., early childhood environments, schools, after-school programs, recreation and community settings, families and peers, special education environments).

EDUC 840-854 Educational Studies Area Tutorials
Area tutorials in Educational Studies consist of philosophical, historical, social psychological, sociological and anthropological aspects of education locally, nationally, and internationally. These may include, but are not limited to, comparative study or early childhood education thought and practice, multicultural education, policy and practice in diverse school settings, curriculum issues and indigenous knowledge, mediated learning environments, curriculum theory, moral education, issues of difference in sexual orientation, class, race, and gender.

EDUC 855-869 Applied Linguistics Area Tutorials
Area tutorials in Applied Linguistics consist of a variety of topics related to second-language learning and teaching. More specifically they may focus on interlanguage development; teaching of pronunciation; role of routinization in language acquisition; acquisition of second language vocabulary; teaching and learning of second language phonology.

Master of/Magisteriate in Arts (Educational Technology)

Master of/Magisteriate in Arts with Thesis (Option A)

This option is divided into two areas: Area I (Research in and Development of Educational Technology) and Area II (Production and Evaluation of Educational Materials).

Admission Requirements. Entry into the program is based on the individual backgrounds of applicants, who should possess a bachelor's/baccalaureate degree with at least a major or the equivalent in any subject. An average of at least a *B* in the major or equivalent is required. Students from the Diploma in Instructional Technology (who have not graduated from the Diploma) may apply for admission with advanced standing. A maximum of 18 credits may be transferred.

Language Requirement. For students whose first language is neither English or French, a test of English language proficiency is required prior to admission. To fulfill this requirement, the student must provide one of the following: 1) TOEFL iBT results of 90+; 2) TOEFL PBT result of 577+ with a writing score of 5.0+; 3) an IELTS score of 7+; or, 4) proof that the student has achieved the level of Concordia's English 212 course (testing is available through Concordia University's English Department—please contact that Department for further details).

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to complete a minimum of 60 credits.
- **Residence.** The minimum residence requirement is two years (6 terms) of full-time study, or the equivalent in part-time study.
- **Language Competency Requirement for All Students.** French or other language requirements for students undertaking an internship are determined and assessed by the organization hosting the internship. It is the student's responsibility to attain the competency level required.
- **Courses.** The individual course of study is decided in consultation with the student's academic advisor, although certain courses are required of all students.
    - **Core Courses.** ETEC 613 (3 credits), ETEC 648 (6 credits) and ETEC 712 (6 credits).
    - **Elective Courses.** 24 credits chosen from the list of courses which follows under **Elective Courses**, in consultation with the advisor.
    - **Internship.** ETEC 790 (3 credits). This course normally consists of a supervised internship activity (minimum of 140 hours) in the University or in the field. An internship may consist of a course or program analysis, materials design and/or production, systems analysis and design, or participation in research projects, or be a project typically conducted in industry, schools, or government organizations.
- **Thesis (Area I).** Students will register for ETEC 795 (3 credits) and ETEC 796 (15 credits), comprising a written thesis proposal, a thesis and an oral defence. For purposes of registration, this work will be designated as ETEC 796 (15 credits).
- **Thesis-Equivalent (Area II).** Students will register for ETEC 795 (3 credits) and ETEC 796 (15 credits), comprising a written thesis-equivalent proposal, a thesis-equivalent and an oral defence.

Students are required to produce educational materials to achieve specific objectives (e.g., an educational television production or a computer-based instructional program) and their evaluation.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** If one "C" grade is received it will count toward the required or optional courses in the program. However, if a student receives a second "C" grade, the case will be reviewed by the program's faculty Committee which will recommend to the School of Graduate Studies whether the student shall be permitted to continue in the program. If allowed to continue, the student must either repeat one of the courses that was granted a "C" or register for an acceptable substitute approved by the Graduate Program Director. If any further "C" grades are received, the student will be withdrawn from the program. Students who have been withdrawn may apply for re-admission.
- **F Rule.** Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the School of Graduate Studies. Students who have been withdrawn may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts without Thesis (Option B)

Admission Requirements. Entry into this program is based on the individual backgrounds of applicants, who should possess a bachelor's/baccalaureate degree with at least a major or the equivalent in any subject. An average of at least a *B* in the major or equivalent is required. Students from the Diploma in Instructional Technology (who have not graduated from the Diploma) may apply for admission with advanced standing. A maximum of 18 credits may be transferred. However, no financial credit will be given.

Language Requirement. For students whose first language is neither English or French, a test of English language proficiency is required prior to admission. To fulfill this requirement, the student must provide one of the following: 1) TOEFL iBT results of 90+; 2) TOEFL PBT result of 577+ with a writing score of 5.0+; 3) an

IELTS score of 7+; or, 4) proof that the student has achieved the level of Concordia's English 212 course (testing is available through Concordia University's English Department—please contact that Department for further details).

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to complete a minimum of 60 credits.
- **Residence.** The minimum residence requirement is two years (6 terms) of full-time study, or the equivalent in part-time study.
- **Language Competency Requirement for All Students.** French or other language requirements for students undertaking an internship are determined and assessed by the organization hosting the internship. It is the student's responsibility to attain the competency level required.
- **Courses.** The individual course of study is decided in consultation with the student's academic advisor, although certain courses are required of all students.
    - **Core Courses.** ETEC 613 (3 credits), ETEC 648 (6 credits) and ETEC 712 (6 credits).
    - **Elective Courses.** 24 credits to be chosen from the list of courses which follows under **Elective Courses**, in consultation with the advisor.
- **Internship II.** ETEC 791 (15 credits). ETEC 791 normally consists of an extensive activity (minimum 675 hours) in the university or in the field. The experience will vary with the interests of the student and the opportunities available. The objectives are: to apply skills acquired in program courses; to obtain more "real world" experience with the actual practice of educational technology; and to undertake a synthesizing process which combines the subjects studied separately within the program in a single undertaking.
- **Internship Report.** ETEC 792 (6 credits). The internship report will address both the scholarly/academic and professional practice aspects of Educational Technology. Typically 10,000 or more words in length, the report should contain at least two parts: 1. A detailed description of the Internship II activities, utilizing a case study format; including relevant references to the literature. 2. A conclusions and recommendations section which outlines what was learned, what one would do differently, and what potentially generalizable principles one might recommend to fellow educational technologists encountering similar circumstances. The student completes the internship by disseminating the experiences detailed in the report in a public presentation.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

- **C Rule.** If one "C" grade is received it will count toward the required or optional courses in the program. However, if a student receives a second "C" grade, the case will be reviewed by the program's faculty Committee which will recommend to the School of Graduate Studies whether the student shall be permitted to continue in the program. If allowed to continue, the student must either repeat one of the courses that was granted a "C" or register for an acceptable substitute approved by the Graduate Program Director. If any further "C" grades are received, the student will be withdrawn from the program. Students who have been withdrawn may apply for re-admission.
- **F Rule.** Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the School of Graduate Studies. Students who have been withdrawn may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Course Themes (for Options A and B)

The MA program in Educational Technology offers four course themes to aid students in focusing their elective course of study. Each theme has a set of recommended courses and is designed to help students develop skill and knowledge in the appropriate areas. Students may choose to follow all or part of these themes. Since not all courses will be offered every year, course planning should be done carefully and with the aid of a faculty advisor. Please see the program publications for detailed course patterns.

Computer-Aided Learning. Computers have the potential to improve education and training. This concentration in educational computing provides background in learning and instructional theories relevant to the design of effective computer-aided learning materials. Practical skills are emphasized, including methods of using computers to coordinate multi-media tutoring systems, and methods of using computers to solve problems confronting administrators, teachers, researchers and students. Additional topics of study include knowledge representation and artificial intelligence.

Educational Media. Media have become increasingly important in education and training, especially in the computer-based and visual domains. In order for educational technologists to develop and implement instruction involving media, they must first acquire the theoretical knowledge and practical skills necessary to supervise the production of media-based content. The media concentration offers familiarization in print-based systems, interactive video, multi-media computer-assisted learning, sound, and imaging.

Distance Education. The concentration on distance education builds upon the MA Program's strengths in human performance technology, audio visual media production, computer-assisted learning and research. The courses in this pattern address specific issues in distance education related to analysis of various DE design models, materials production and delivery, student support, administration of educational technology units and evaluation. The concentration is intended for both practitioners of distance education and those interested in pursuing a career in an internationally, rapidly growing area of education.

Human Performance Technology. By following the HPT concentration, a student can acquire the basis for sound practice in human resource development. Developing human resources is an increasingly important function in corporate, industrial, government and educational settings. This can entail a broad spectrum of knowledge and skills: needs analysis; designing instructional systems; designing, producing and evaluating training programs in a variety of media; and managing human resource operations in a manner consistent with strategic goals.

Courses

The master's level courses offered in educational technology fall into the following categories:

ETEC 600-609 Philosophical and Theoretical Foundations of Educational Technology
ETEC 610-619 Psychological Aspects of Educational Technology
ETEC 620-629 Studies in Communication Theory
ETEC 630-639 Studies in the Development and Evaluation of Curriculum and Educational Materials
ETEC 640-649 Studies in Research Methodology for Educational Technology
ETEC 650-659 Problems in Educational Systems Analysis and Planning
ETEC 660-669 Studies in Educational Computing
ETEC 670-679 Problems in Educational Innovation
ETEC 680-689 Educational Multimedia Production
ETEC 691-699 Research Topics in Educational Technology
ETEC 700-709 Studies in the Management of Learning Resources
ETEC 710-719 Studies in Human Performance Technology
ETEC 790-799 Thesis and Internship in Educational Technology

Core Courses

ETEC 613 Learning Theories (3 credits)
This course examines the processes of specifying and producing environmental conditions for observing and promoting changes in the student. Its focus is the study of the learning process (including the learner). The student will be expected to develop a general understanding of the major theoretical and practical approaches to the study of learning and to begin to develop competence in selected aspects of the area.

ETEC 648 Fundamental Methods of Inquiry for Educational Technology (6 credits)
This course provides an introduction to the philosophy of inquiry and to the main methodologies of inquiry which are particularly appropriate to educational technology and provide guidance in the communication of results of research, and reflective practice. The course also provides laboratory work with appropriate computer software for each methodology.
Note: Students who have received credit for ETEC 544/644 and ETEC 545/645 may not take this course for credit.

ETEC 712 Human Performance Technology (6 credits)
Human performance technology combines knowledge from several areas of practice (needs assessment, task analysis, instructional design, media selection, organizational design) to permit appropriate responses to performance problems on the job. The course will entail a wide range of readings and activities–lectures, class studies, workshops and projects.
Note: Students who have received credit for ETEC 510/710 and ETEC 511/711 may not take this course for credit.

Elective Courses

The department currently offers the courses listed below. Each course is worth 3 credits unless otherwise indicated. The pattern of courses offered may vary from year to year. Detailed information on the courses offered in a given year is available from the department.

ETEC 604 Fundamentals of Educational Technology
ETEC 606 Educational Cybernetics
Prerequisite: Must have completed 12 Educational Technology graduate credits.
ETEC 607 Philosophical Aspects of Educational Technology
Prerequisite: Must have completed 12 Educational Technology graduate credits.
ETEC 616 Topics in Learning Theories
Prerequisite: ETEC 513/613.
ETEC 620 Theory and Practice in Educational Communication
Note: Students who have received credit for ETEC 514, 520 or 614 may not take this course for credit.
ETEC 635 Principles of Educational Message Design
ETEC 636 Evaluation of Educational Materials
Prerequisite: ETEC 512/712 (6 credits).
Note: Students who have received credit for ETEC 536 may not take this course for credit.
ETEC 637 Educational Simulation and Gaming
Prerequisites: ETEC 513/613, and ETEC 512/712 (6 credits).
ETEC 646 Introduction to Qualitative and Case Study Research
Prerequisite: ETEC 548/648 (6 credits).

ETEC 649 Topics in Methods of Inquiry (3 credits)

Prerequisite: ETEC 548/648 (6 credits).

ETEC 653 Educational Systems Analysis

Prerequisite: ETEC 548/648 (6 credits).

ETEC 655 Global Perspectives in E-Learning

Note: Students who have received credit for ETEC 555 or 693B may not take this course for credit.

ETEC 660 Introduction to Educational Computing

Prerequisite: Computer Literacy course or equivalent.

ETEC 662 Social Computing and Computer-Supported Collaborative Learning and Working (CSCL/W)

Note: Students who have received credit for ETEC 562 or 693A may not take this course for credit.

Prerequisite: ETEC 560/660.

ETEC 664 Computer Assisted Instruction

Prerequisites: ETEC 513/613 and ETEC 560/660 (6 credits).

ETEC 665 Introduction to Digital Media in Education

Pre- or Co-Requisite: ETEC 560/660.

Note: Students who have received credit for ETEC 565 or ETEC 693D may not take this course for credit.

ETEC 666 Modelling and Simulation

ETEC 667 Knowledge Management

Note: Students who have received credit for ETEC 567 or 693W may not take this course for credit.

ETEC 669 Designing and Developing Web-Based Interactive Instruction/Performance Systems

Prerequisites: ETEC 512/712, 513/613 and 565/665.

Note: Students who have received credit for ETEC 568/668 or 569 or ETEC 693E may not take this course for credit.

ETEC 676 Human Resources Development

Note: Students who have received credit for ETEC 576 may not take this course for credit.

ETEC 682 Laboratory in Studio Television Production and Evaluation for Education I

ETEC 683 Planning and Producing Audiovisual Programs

Prerequisites: ETEC 512/712, 513/613 and 565/665.

Note: Students who have received credit for ETEC 580/680 or 583 or 693F may not take this course for credit.

ETEC 684 Designing and Developing Print-Based Content

Prerequisites: ETEC 512/712; 513/613; and 565/665.

Note: Students who have received credit for ETEC 505/705 or 584 or ETEC 693G may not take this course for credit.

ETEC 685 Digital Media Studio

Prerequisites: ETEC 565/665 plus one of the following: ETEC 569/669, 583/683 or 584/684.

Note: Students who have received credit for ETEC 585 may not take this course for credit.

ETEC 691 Advanced Readings and Research in Educational Technology I

ETEC 692 Advanced Readings and Research in Educational Technology II

ETEC 693 Special Issues in Educational Technology

ETEC 695 Topics in Educational Informatics I

ETEC 701 Administration of Educational Technology Units for Education and Training Systems

ETEC 702 Fundamentals of Distance Education

ETEC 703 Design, Preparation and Evaluation of Mixed Media Courseware for Distance Education

Prerequisites: ETEC 513/613, and 512/712 (6 credits).

Note: Students who received credit for ETEC 594 may not take this course for credit.

ETEC 704 Project Management

Note: Students who have received credit for ETEC 594 or 693I may not take this course for credit.

ETEC 710 Instructional Design I

ETEC 711 Instructional Design II

ETEC 715 Topics in Human Performance Technology (3 credits)

Prerequisite: ETEC 512/712 (6 credits).

ETEC 790 Internship I (Thesis Option) (3 credits)

ETEC 791 Internship II (Non-Thesis Option) (15 credits)

ETEC 792 Internship Report (Non-Thesis Option) (6 credits)

Prerequisite: ETEC 791.

ETEC 795 Thesis Proposal (3 credits)

ETEC 796 Thesis or Thesis-Equivalent (15 credits)

Prerequisite: ETEC 795.

Cognate Courses

Graduate students in educational technology may be permitted to register for up to two elective courses (6 credits) offered in other graduate programs. In all such cases, prior permission of the Graduate Program Director is required.

Diploma in Instructional Technology

Admission Requirements. Entry into the program is based on the individual backgrounds of applicants, who must possess a bachelor's degree with at least a major or the equivalent in any subject. The program is open to full-time and part-time students without preference.

Language Requirement. For students whose first language is neither English or French, a test of English language proficiency is required prior to admission. To fulfill this requirement, the student must provide one of the following: 1) TOEFL iBT results of 90+; 2) TOEFL PBT result of 577+ with a writing score of 5.0+; 3) an IELTS score of 7+; or, 4) proof that the student has achieved the level of Concordia's English 212 course

(testing is available through Concordia University's English Department—please contact that Department for further details).

Requirements for the Diploma

- **Credits.** A fully-qualified candidate is required to complete a minimum of 30 credits.
- The course requirements will generally be completed in one year, including a summer term, or the equivalent.
- **Courses.** All candidates are required to take ETEC 504, 512 (6 credits), 513 and 591 for a total of 15 credits, plus a minimum of 15 credits selected from the elective courses.
- Research papers, essays, examinations or preparation of audio-visual materials may be required as part of the work for individual courses.

Academic Regulations

- **GPA Requirement.** Graduate Diploma students must maintain a minimum GPA of 2.70 during their program of study in order to be considered a student in good standing.
- **C Rule.** If one "C" grade is received it will count toward the required or optional courses in the program. However, if a student receives a second "C" grade, the case will be reviewed by the program's faculty Committee which will recommend to the School of Graduate Studies whether the student shall be permitted to continue in the program. If allowed to continue, the student must either repeat one of the courses that was granted a "C" or register for an acceptable substitute approved by the Graduate Program Director. If any further "C" grades are received, the student will be withdrawn from the program. Students who have been withdrawn may apply for re-admission.
- **F Rule.** Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the School of Graduate Studies. Students who have been withdrawn may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a Diploma, for full-time students must be completed within 6 terms (2 years) from the time of initial registration in the program at Concordia University; for part-time students, the time limit is 12 terms (4 years).
- **Graduation Requirement.** To graduate, students must have completed all course requirements with a cumulative GPA of at least 2.70.

Courses

A number of courses selected from the following list will be offered in either summer, fall or winter terms.

Required Courses

ETEC 504 Fundamentals of Educational Technology (3 credits)
Theory and research in instructional communications; mediational factors in the teaching-learning process; factors influencing selection of instructional means and equipment; psychological factors related to learning domains (cognitive, affective and psycho-motor).

ETEC 512 Human Performance Technology (6 credits)
Human performance technology combines knowledge from several areas of practice (needs assessment, task analysis, instructional design, media selection, organizational design) to permit appropriate responses to performance problems on the job. The course will entail a wide range of readings and activities — lectures, class studies, workshops and projects.
Note: Students who have received credit for ETEC 510/710 and ETEC 511/711 may not take this course for credit.

ETEC 513 Learning Theories (3 credits)
This course examines the processes of specifying and producing environmental conditions for observing or promoting changes in the student. Its focus is the study of the learning process (including the learner). The student will be expected to develop a general understanding of the major theoretical and practical approaches to the study of learning and to begin to develop competence in selected aspects of the area.

ETEC 591 Administration of Educational Technology Units for Educational and Training Systems (3 credits)
Study of principles and techniques required in administering a complete educational or training sub-system within a larger operational system; learning goals; definition and validation of outcomes; choice of learning strategies and media evaluation.

Elective Courses

The department currently offers the courses listed below. Each course is worth 3 credits unless otherwise indicated. The pattern of courses offered may vary from year to year. Detailed information on the courses offered in a given year is available from the department.

ETEC 503 Design, Preparation and Evaluation of Mixed Media Courseware for Distance Education
Prerequisites: ETEC 513/613, and 512/712 (6 credits).
ETEC 506 Educational Cybernetics
Prerequisite: Must have completed 12 Educational Technology graduate credits.
ETEC 515 Topics in Human Performance Technology
Prerequisite: ETEC 512/712 (6 credits).

ETEC 516 Topics in Learning Theories

Prerequisite: ETEC 513/613.

ETEC 520 Theory and Practice in Educational Communication

Note: Students who have received credit for ETEC 514, 614 or 620 may not take this course for credit.

ETEC 521 Media and the Young Child

ETEC 535 Principles of Educational Message Design

ETEC 536 Evaluation of Educational Materials

Prerequisite: ETEC 512/712 (6 credits).

Note: Students who have received credit for ETEC 636 may not take this course for credit.

ETEC 537 Educational Simulation and Gaming

Prerequisites: ETEC 513/613, and 512/712 (6 credits).

ETEC 546 Introduction to Qualitative and Case Study Research

Prerequisite: ETEC 548/648 (6 credits).

ETEC 548 Fundamental Methods of Inquiry for Educational Technology (6 credits)

Note: Students who have received credit for ETEC 544/644 and ETEC 545/645 may not take this course for credit.

ETEC 549 Topics in Methods of Inquiry

Prerequisite: ETEC 548/648 (6 credits).

ETEC 555 Global Perspectives in E-Learning

Note: Students who have received credit for ETEC 655 or 693B may not take this course for credit.

ETEC 560 Introduction to Educational Computing

Prerequisite: Computer literacy or equivalent.

ETEC 562 Social Computing and Computer-Supported Collaborative Learning and Working (CSCL/W)

Note: Students who have received credit for ETEC 662 or 693A may not take this course for credit.

ETEC 564 Computer-Assisted Instruction

Prerequisites: ETEC 513/613 and 560/660 (6 credits).

ETEC 565 Introduction to Digital Media in Education

Pre- or Co-Requisite: ETEC 560/660.

Note: Students who have received credit for ETEC 665 or ETEC 693D may not take this course for credit

ETEC 566 Modelling and Simulation

ETEC 567 Knowledge Management

Note: Students who have received credit for ETEC 667 or 693W may not take this course for credit.

ETEC 569 Designing and Developing Web-Based Interactive Instruction/Performance Systems

Prerequisites: ETEC 512/712, 513/613 and 565/665.

Note: Students who have received credit for ETEC 568/668, 669 or ETEC 693E may not take this course for credit.

ETEC 571 Media and the Adult Learner

ETEC 572 Studies in Instructional Technology for Adult Learners

ETEC 576 Human Resources Development

Note: Students who have received credit for ETEC 676 may not take this course for credit.

ETEC 582 Laboratory in Studio Television Production and Evaluation or Education I

ETEC 583 Planning and Producing Audiovisual Programs

Prerequisites: ETEC 512/712, 513/613 and 565/665.

Note: Students who have received credit for ETEC 580/680 , 683 or ETEC 693F may not take this course for credit.

ETEC 584 Designing and Developing Print-Based Content

Prerequisites: ETEC 512/712, 513/613 and 565/665.

Note: Students who have received credit for ETEC 505/705 , 684 or ETEC 693G may not take this course for credit.

ETEC 585 Digital Media Studio

Prerequisites: ETEC 565/665 plus one of the following: ETEC 569/669, 583/683 or 584/684.

Note: Students who have received credit for ETEC 685 may not take this course for credit.

ETEC 592 Fundamentals of Distance Education

ETEC 594 Project Management

Note: Students who have received credit for ETEC 693I or 704 may not take this course for credit.

ETEC 595 Topics in Educational Informatics I

Educational Studies

Master of/Magisteriate in Arts (Educational Studies)

Admission Requirements. For entry into the program, a first degree with a minimum GPA of 3.00 (*B* average) is required with an appropriate concentration in a field of study relevant to Educational Studies. The applicant should also have a minimum of two years professional activity in education or an undergraduate record which includes at least three courses in education, each with a grade of *B* or better. Qualified applicants who fail to meet the criteria outlined may be required to take up to 12 undergraduate credits in addition to the regular graduate program, or, as appropriate, a qualifying program. (See section on Qualifying Students).

Language Requirement. For students whose first language is neither English or French, a test of English language proficiency is required prior to admission. To fulfill this requirement, the student must provide one of the following: 1) TOEFL iBT results of 90+; 2) TOEFL PBT result of 577+ with a writing score of 5.0+; 3) an IELTS score of 7+; or, 4) proof that the student has achieved the level of Concordia's English 212 course (testing is available through Concordia University's English Department—please contact that Department for further details).

Requirements for the Degree

- **Credits.** A fully-qualified candidate must complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** These vary according to the thesis and non-thesis options (see below).

The degree requirements (45 credits) can be met by the successful completion either of course work and a thesis in an approved area, or of more extended course work and ESTU 692: Directed Study. The choice of a thesis or non-thesis option will normally be determined at an early stage in the student's program. A tentative detailed outline of the proposed research topic must be submitted with the application for admission to the program. A student who completes a thesis or a directed study will normally be required to defend it in an oral examination. Proposed research topics in both options must be approved by the graduate Educational Studies Committee.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** If one "C" grade is received it will count toward the required or optional courses in the program. However, if a student receives a second "C" grade, the case will be reviewed by the program's faculty Committee which will recommend to the School of Graduate Studies whether the student shall be permitted to continue in the program. If allowed to continue, the student must either repeat one of the courses that was granted a "C" or register for an acceptable substitute approved by the Graduate Program Director. If any further "C" grades are received, the student will be withdrawn from the program. Students who have been withdrawn may apply for re-admission.
- **F Rule.** Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the School of Graduate Studies. Students who have been withdrawn may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed before or during the calendar year, 12 terms (four years) from the year of initial registration in the program at Concordia University; for part time students the time limit is 15 terms (five years). Any student who does not complete their master's program within the time limit must submit a reasoned request for an extension to the Educational Studies Committee up to a maximum of two extensions.

This Committee will recommend or not recommend to the School of Graduate Studies whether they can maintain their registration in the program.

- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts without Thesis (Option A)

Students will take eleven 3-credit courses plus ESTU 692: Directed Study (with Extended Essay or Research Project) (12 credits). In consultation with their academic advisor, students must normally take at least four core courses (see below).

Master of/Magisteriate in Arts with Thesis (Option B)

Students will take eight 3-credit courses plus ESTU 690: Thesis and Tutorial (21 credits). In consultation with their academic advisor, students must normally take at least two core courses (see below).

Concentration in Adult Education. In either Option A or Option B, students may complete a concentration in Adult Education. As part of the required core courses of both options, students must take ESTU 670 (3 credits) and three 3-credit courses chosen from adult education topic courses (i.e. ESTU 671-677 below).

Courses

Courses listed indicate the full range of offerings. They are offered subject to the availability of faculty, and (with the exception of a minimum of six core courses) not all in a given year. All are 3-credit (one-term) courses unless otherwise indicated.

Core Courses

Specific topic areas of study include: Issues of Difference: Gender, Class and Race; politics and education; class, culture and education; educational problems in historical and philosophical perspectives; minority status and learning; literacy; inter-cultural and cross-cultural education; school and society; curriculum, popular culture and education; and comparative and intercultural education. Courses listed indicate the full range of offerings. They are offered subject to the availability of faculty and (with the exception of a minimum of six core courses) not all in a given year. All are 3-credit (one term) courses unless otherwise indicated.

ESTU 601 Philosophical Issues in Educational Research
There are a number of important philosophical questions that lie behind the everyday practice of education research. The questions include: What does it mean to say that research in education is “scientific”? Is science (and, by extension, educational research) really value neutral and objective? What kinds of

education research should count as legitimate? In the first part of the course, various definitions of science, for example, those of Karl Popper and Thomas Kuhn, and some influential critiques of the scientific enterprise are examined. In the second part of the course, some of the ongoing debates about appropriate research methods in education are analyzed.

ESTU 611 Philosophical Perspectives in Education

This course is a forum for common inquiry and reflection upon issues that have deep significance for our lives as human beings, students, and educators. Some emphasis is placed on gaining an understanding of historically significant philosophical positions and their application to problems of teaching and education. However, the primary focus is on cultivating a desire and commitment to engage in philosophical thinking as it applies to matters of concern to teachers and teaching. The course is premised on a number of questions. These include but are not limited to: What is education? How do we understand education in its moral, ethical and spiritual dimensions? What role does education play (or have the potential of playing) in personal and social transformation? What is effective teaching and how can we cultivate the courage to teach effectively?

ESTU 612 Historical Perspectives in Education

This course acquaints students with a broad historical approach to a variety of significant educational issues. The emphasis will be placed on the examination of a number of critical components of modern educational thought and practice (comprising e.g., alternative schools of educational thought, politics and education, the changing curriculum, or the organization of schooling) as seen and presented in historical perspective.

ESTU 613 Anthropological Concepts and Methods in Education

The course introduces the students to qualitative methods in educational research. The first purpose is to review studies of education which utilize anthropological concepts and/or methods. The second purpose is to examine the three principal foci of qualitative research in the area: a. schools and their relations with the socio-cultural milieu in which they exist; b. the description and analysis of classroom processes; c. the study of individual pupils and educators. The third purpose is to assess the strengths and weaknesses of studies focusing on these areas. This includes describing and discussing some of the systematic methodological biases apparent in the literature and suggesting directions for future research.

ESTU 614 Social Psychological Foundations of Education

The course provides a basic understanding of the ways in which psychologists examine and analyze human behaviour, collect and interpret data, develop theories and form generalizations. It is not intended as a general survey course in the area of educational psychology. Several topics in an area will be studied in order to exemplify the methods and techniques employed in the psychological analysis of behaviour in educational settings.

ESTU 615 Introduction to Research in Education

By providing an overview of the commonly used research methods in education today, students gain the knowledge required to critique research that is reported in the education and social science literature. Topics include the nature of educational research, the different qualitative and quantitative research approaches, types of data collection, and knowledge of research ethics. Students gain experience in developing a research statement and writing a research proposal.

ESTU 635 Studies in Educational Change

This course is concerned with the investigation and comparison of problems of education in the context of time and society. Concentrating on concrete "case studies" chosen from the 19th century and the contemporary period, it focuses on the principles on which systems of education are constructed, and their change or retention, in the broad socio-economic and ideological context.

ESTU 644 School and Society

This course is concerned with the family, the educational system, the economy and the polity, and with the relations between them. The main concern is with social institutions and the socialization process with which they are involved. Particular emphasis will be placed on the social class differentials in the conditions of socialization and educational opportunity, and on social class differentials in educational achievement.

ESTU 670 Adult Education as a Field of Study

This course is designed as a survey at an advanced level, of the theory and practice of adult education through an examination of the existing literature. Emphasis will be placed on helping the student gain knowledge, understanding, and a critical perspective of the following: aims; history and philosophy; needs and characteristics of adult learners; functions and skills of adult education practitioners; settings, agencies and program areas; and planning and evaluation in adult education. A Canadian and Quebec perspective will be emphasized.

Topic Courses

ESTU 602 Educational Theory
ESTU 603 The Philosophy of the Curriculum
ESTU 604 Philosophy of Education
ESTU 606 Study of a Philosopher of Education
ESTU 608 Selected Area of Education
ESTU 620 History of Canadian Education
ESTU 631 Anthropology and Education I
ESTU 632 Anthropology and Education II
ESTU 633 History of Educational Ideas
ESTU 640 Sociology of Education

ESTU 641 Topics in Sociology of Education II
ESTU 642 Selected Topics in Educational Problems
ESTU 643 The Education of Immigrants and Minorities
ESTU 645 Curriculum Theory
ESTU 648 Politics and Education
ESTU 650 Social Psychology of Education
ESTU 653 Psychology of Education
ESTU 671 Adults as Learners
ESTU 672 Facilitating Adult Learning
ESTU 673 Administration of Adult Education Programs
ESTU 674 Evaluating Adult Learning Projects
ESTU 675 Concepts and Values in Adult Education
ESTU 676/ADIP 597 Adult Education I - Selected Topics
ESTU 677/ADIP 598 Adult Education II - Selected Topics

General Courses (All Options)

ESTU 680 Reading Course
ESTU 681 Reading Course
ESTU 682 Reading Course

Thesis and Directed Study

ESTU 690 Thesis and Tutorial (21 credits)
ESTU 692 Directed Study (with Extended Essay or Research Project) (12 credits)

Adult Education

Diploma in Adult Education

Admission Requirements. For admission, a Bachelor's/Baccalaureate degree or equivalent is required. Entry into the program is based upon an assessment of the background and skills of the individual applicant. Applicants should be actively involved in some area of adult education or have the equivalent of one year's experience in the field, (for example, as group leader, trainer, nurse educator, volunteer worker, administrator in an academic institution, business, industry, government or community organization).

Language Requirement. For students whose first language is neither English or French, a test of English language proficiency is required prior to admission. To fulfill this requirement, the student must provide one of the following: 1) TOEFL iBT results of 90+; 2) TOEFL PBT result of 577+ with a writing score of 5.0+; 3) an

IELTS score of 7+; or, 4) proof that the student has achieved the level of Concordia's English 212 course (testing is available through Concordia University's English Department—please contact that Department for further details).

Requirements for the Diploma (Adult Education Program)

- **Credits.** Fully-qualified candidates are required to complete a minimum of 30 credits.
- **C Rule.** If one "C" grade is received it will count toward the required or optional courses in the program. However, if a student receives a second "C" grade, the case will be reviewed by the program's faculty Committee which will recommend to the School of Graduate Studies whether the student shall be permitted to continue in the program. If allowed to continue, the student must either repeat one of the courses that was granted a "C" or register for an acceptable substitute approved by the Graduate Program Director. If any further "C" grades are received, the student will be withdrawn from the program. Students who have been withdrawn may apply for re-admission.
- **F Rule.** Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the School of Graduate Studies. Students who have been withdrawn may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission..
- **Courses.** All candidates are required to complete the following courses: ADIP 500, 585 and 586 and
  3 credits chosen from ADIP 501, 511, 512, 535, and
  3 credits chosen from ADIP 513, 514, 515, 544, and
  9 credits chosen from ADIP 510, 520, 530, 533, 540, 541, 542, 550, 551, 570, 572, 588, 589, 590, 597, 598, and 6 credits chosen from another graduate program, in consultation with the graduate program director or student advisor.
  In special circumstances students may, in consultation with the graduate program director or student advisor, individualize their program of study within the standards set out by the School of Graduate Studies.

Courses

Courses in the following list will be offered in fall, winter and summer terms, depending upon demand and availability of faculty. Courses are worth 3 credits.

ADIP 500 Adult Education in Québec as a Field of Study
ADIP 501 Educational Concepts and Research
ADIP 510 Adult Education in Québec and Canada
ADIP 511 Educational Problems in Philosophical Perspective
ADIP 512 Educational Problems in Historical Perspective

ADIP 513 Anthropological Concepts and Methods in Education
ADIP 514 Social Psychological Foundations of Education
ADIP 515 Research Issues and Methodologies in Education
ADIP 520 Adults as Learners
ADIP 530 Roles and Competencies of Adult Educators
ADIP 533 Facilitating Adult Learning
ADIP 535 Studies in Educational Change
ADIP 540 Introduction to Research in Adult Education
ADIP 541 Designing Adult Learning Projects
ADIP 542 Evaluating Adult Learning Projects
ADIP 544 School and Society
ADIP 550 Reflective Practice I
ADIP 551 Introduction to Administration of Adult Education Programs
EDUC 553 Education in Québec
ADIP 570 Workshops for Adult Educators
ADIP 572 Concepts and Values in Adult Education
ADIP 580 Reading Course
ADIP 581 Reading Course
ADIP 588 Advanced Topics in Adult Education
ADIP 589 Advanced Topics in Adult Education
ADIP 590 Issues in the Practice in Adult Education

ADIP 585 Integrative Internship I
Prerequisite: Students must have completed at least 15 credits in their program of study, including ADIP 500 Adult Education in Quebec. This course is associated with, and normally represents, a prerequisite for Integrative Internship II.
Integrative Internship I is designed to allow students to build on their acquired knowledge, skills, values and attitudes through interaction with a chosen education environment. The first Internship requires students to select, contact and establish a working relation with an organization which offers educational activities to adults in their community. A supervised Special Project for an adult education provider is initiated. At this stage, the emphasis is on observation and information gathering, in preparation for taking on a more active role in Integrative Internship II.

ADIP 586 Integrative Internship II
Prerequisite: ADIP 585.
This internship is designed to extend the student's personal aims and philosophy of adult education arrived at in Integrative Internship I by completing a supervised Special Project in an approved adult education facility, where supervision is provided by a member of a host institution in consultation with the professor.

ADIP 593 Practicum I

Prerequisite: At least 18 credits in the Diploma in Adult Education Teacher Certification Option II.
This course is designed for students who possess a Provincial Teaching Authorization or are currently working in adult education in the Quebec school system. Students enroling in this practicum are expected to have completed courses in theoretical and conceptual content in the field of adult education. This practicum provides an opportunity in which they can apply this knowledge to their classroom teaching experience.
Note: Upon presentation of a statement from the school authority attesting to the satisfactory performance in an adult education classroom for a minimum of four months, a student may be exempted from this course.

ADIP 594 Practicum II

Prerequisite: ADIP 593.
This course is designed for students who possess a Provisional Teaching Authorization or are currently working in adult education in the Quebec school system. Satisfactory classroom performance in the student's subject matter specialty is judged on the basis of reports from the school principal, mentors chosen from the teaching staff, and a supervisor from the University.

ADIP 597 Adult Education I - Selected Topics
ADIP 598 Adult Education II - Selected Topics

Child Studies

Master of/Magisteriate in Arts (Child Studies)

Admission Requirements. Applicants will be selected on the basis of past academic records, letters of recommendation, field experience, and the relevance of their proposed research to the areas of specialization of program faculty. To be accepted into the program, a student is required to have an undergraduate degree with a minimum of a *B* average and a significant concentration in child studies, education, or related discipline. In addition, at least one year of professional experience in the field of child care, education, or related areas is desirable. Bilingualism is an asset, but not a requirement. The equivalence of foreign degrees is assessed by the School of Graduate Studies, and is determined by consideration of the total length of program study (primary through university) as well as the quality and content of post-secondary study and its relevance to this program.

Language Requirement. For students whose first language is neither English or French, a test of English language proficiency is required prior to admission. To fulfill this requirement, the student must provide one of the following: 1) TOEFL iBT results of 90+; 2) TOEFL PBT result of 577+ with a writing score of 5.0+; 3) an IELTS score of 7+; or, 4) proof that the student has achieved the level of Concordia's English 212 course (testing is available through Concordia University's English Department—please contact that Department for further details).

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** Students may enter either Option A or B outlined below and must complete CHST 600, 603, 607, and 608 as the core segment of their program.

Academic Regulations

- **C. Rule.** If one "C" grade is received it will count toward the required or optional courses in the program. However, if a student receives a second "C" grade, the case will be reviewed by the program's faculty Committee which will recommend to the School of Graduate Studies whether the student shall be permitted to continue in the program. If allowed to continue, the student must either repeat one of the courses that was granted a "C" or register for an acceptable substitute approved by the Graduate Program Director. If any further "C" grades are received, the student will be withdrawn from the program. Students who have been withdrawn may apply for re-admission.
- **F Rule.** Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the School of Graduate Studies. Students who have been withdrawn may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.

Master of/Magisteriate in Arts with Thesis (Option A)

- **Core Courses.** CHST 600, 603, 607, and 608 (15 credits).
- **Elective Courses.** A minimum of 9 credits from CHST 610, CHST 614, CHST 618, CHST 620, CHST 622, CHST 624, CHST 630, CHST 632, CHST 640, and CHST 650 chosen in consultation with the student's advisor.
- **Thesis Proposal.** CHST 697 (3 credits).
- **Research and Thesis.** CHST 698 (18 credits).

Master of/Magisteriate in Arts with Internship (Option B)

- **Core Courses.** CHST 600, 603, 607, and 608 (15 credits).
- **Elective Courses.** A minimum of 12 credits chosen from CHST 610, CHST 614, CHST 618, CHST 620, CHST 622, CHST 624, CHST 630, CHST 632, CHST 640, and CHST 650 chosen in consultation with the student's advisor.
- **Internship Seminar & Field Placement.** CHST 695 (9 credits).

- **Internship Report.** CHST 696 (9 credits).

Courses

The following courses are offered:

Required Courses

These courses are required of all students and form the foundation for further courses in the program.

CHST 600 Advanced Child Development
This course presents an overview of the theories that have helped to shape the field of child development. The impact of various theoretical approaches (e.g., psychoanalytic, cognitive, behavioral, social) is examined by providing perspectives on issues of both historical and contemporary importance.

CHST 603 Seminar: Issues in Child Studies
This course provides students with an overview of the field of child studies. Students are introduced to diverse issues through the work of program faculty, invited scholars and student initiatives.

CHST 607 Methods of Inquiry (6 credits)
This course introduces students to the philosophy of inquiry in the social sciences. Specifically, it focuses on the main methodologies of inquiry that are necessary for interpreting research findings in child studies. The course covers techniques for addressing research questions in the field, including gathering, organizing, analyzing, and communicating data. It also provides laboratory work to give students the opportunity to work with appropriate computer software for key methodologies.

CHST 608 Field Observations
Prerequisite: CHST 607.
This course addresses a range of observational techniques for observing children in their natural environments (e.g., running records, time and event sampling, rating scales). Students learn to use a variety of observational methods, analyze the information, and write reports. Students spend approximately 2-3 hours weekly in an appropriate setting to conduct the observations.
Note: Students who have received credit for CHST 604 may not take this course for credit.

Elective Courses

These courses focus on (a) the child and (b) the wider community. They are offered on a rotating basis with the exception of CHST 630 which is offered every year.

CHST 610 Applied Cognition and Learning

This course provides an overview of the ways in which cognition has contributed to the understanding of how children engage in the content of school subjects, such as mathematics, science, literacy and history. Topics include general cognitive processes, such as memory, transfer, metacognition, and expertise, as well as those related to learning in specific content areas. The course examines ways in which theory and empirical findings can and have informed instructional practice.

CHST 614 Social Processes

This course addresses issues regarding the development of critical social processes in the life of the child, which have implications for later functioning. Topics include the importance of early emotional development (e.g., attachment, temperament, emotional regulation) for social interaction, peer relations (e.g., friendships, bullying and victimization, prosocial behaviour), the development of self and social understanding, the role of play in development, and gender roles and socialization.

CHST 618 Childhood Settings

This course examines a variety of extra-familial settings in which children and families function (e.g. child care, kindergarten, elementary school, after school programs, recreation programs, hospital settings, programs for children with special needs). Various aspects of these programs are examined such as mission statements, program philosophy, training requirements, regulations, and professional development requirements. Methods to evaluate the quality of the settings are presented. Students learn to analyze a specific program of their choosing and write a case study report. Guest lectures and field trips to different types of settings may form part of the course.

CHST 620 Children's Play: From Theory to Practice

This course introduces students to the topic of play with an emphasis on relating theory to practice. Historical and modern theories (e.g., psychoanalytic, cognitive, and social cognitive) of play are discussed. Various definitions and types of play that emanate from theoretical approaches and different approaches to measuring play are covered, as well as the relationship between children's play and domains of development and culture, and curriculum and teaching. Issues related to designing developmentally appropriate play spaces and materials are examined.

CHST 622 The Family

This course addresses major theoretical perspectives on family functioning and the nature of parenting (e.g., transitions to parenting, attachment, child rearing styles, parenting children with special needs) and family relationships (e.g., parent-child, sibling, grandparents). Issues related to the modern Canadian family are also discussed (e.g., single and adolescent parents, divorce and remarriage, parental employment, child care, transition to school, and diversity of family lifestyles).

CHST 624 Curriculum Models in Childhood Settings
This course examines principles and models of curriculum in relation to a range of early childhood settings, including daycare, after school programming, kindergarten, and elementary school. The focus is on analyzing current curriculum models from different perspectives as well as identifying and discussing issues related to curriculum design and implementation. Student interests and areas of study are taken into account in the selection of the readings, interactive curriculum materials, and resources.
Note: Students who have received credit for CHST 601 may not take this course for credit.

CHST 630 Issues in Education: Language, Literacy, Numeracy, and Scientific Reasoning
In this course, students reflect on specific aspects of cognitive development and their impact on education. Topics are offered on a rotating basis and may include the development of language, literacy, numeracy and/or scientific reasoning. The literature on selected topics is examined, with particular emphasis on both classic and current research.

CHST 632 Issues in Inclusive and Special Education
This course examines theoretical issues in inclusive and special education and focuses on educational practices that provide all children with equitable access to learning. Curricula, policies and practices in educational settings are analyzed and provide students with an in-depth understanding so as to meet the needs of diverse learners.

CHST 640 Special Topics in Child Studies
Note: Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g., CHST 640A, CHST 640B, etc.

Note: For elective course descriptions and further information regarding thesis and internship guidelines, consult the Guide to the MA in Child Studies available from the Department of Education.

Directed Study Course

CHST 650 Directed Study
Students may enrol in a directed study under faculty supervision in order to undertake specialized study of theoretical or research-related topics. Permission of the Graduate Program Director is required.

Internship Option

CHST 695 Internship Seminar and Field Placement (9 credits)
Prerequisite: CHST 607.
The internship is designed to provide students with the opportunity to investigate an applied problem or

topical issue in child studies. Course requirements include a seminar in both terms. In the first term, students are required to keep a journal, conduct on-site observations, and formulate a written proposal for the internship project. In the second term, students will conduct their project and maintain their journal. Students are required to spend a minimum of 75 hours in the field placement in the first term and an additional 125 hours (minimum) in their second term.

CHST 696 Internship Report (9 credits)
The final report is a detailed record of the internship project and includes a description and analysis of all work produced for the field placement. In addition, all instruments, curricular materials, journal entries, and other supporting documents are included in the final report.

Thesis Option

CHST 697 Thesis Proposal (3 credits)
Under the supervision of a thesis supervisor, the student writes a proposal presenting a research topic; the overall goal of which is to demonstrate that the student is capable of undertaking an independent research project.

CHST 698 Research and Thesis (18 credits)
The thesis consists of the formulation and presentation of the research results which are then defended before a committee consisting of the student's supervisor and at least two other scholars from the department and/or scholars from relevant disciplines in other departments or institutions.

Applied Linguistics

Master of/Magisteriate in Arts (Applied Linguistics)

Admission Requirements. 1. Competence in written and spoken English; 2. knowledge of another language; 3. an undergraduate degree with at least a *B* average; 4. a grade of *B*+ or higher in each of the three areas of linguistics or language analysis (3 credits), language acquisition (3 credits), and second language teaching methodology (3 credits).

Applicants who meet requirements 1 and 2 but whose undergraduate degrees do not include all the courses listed in requirement 3 above or whose degrees were completed more than five years before applying may be required to take up to 9 credits of prerequisite courses in addition to the requirements for their MA degree.

The acceptability of applicants for admission to this program and the introductory course requirements will be determined by the Applied Linguistics graduate program committee. Preference will be given to candidates who have experience in second-language teaching.

Language Requirement. For students whose first language is neither English or French, a test of English language proficiency is required prior to admission. To fulfill this requirement, the student must provide one of the following: 1) TOEFL iBT results of 90+; 2) TOEFL PBT result of 577+ with a writing score of 5.0+; 3) an IELTS score of 7+; or, 4) proof that the student has achieved the level of Concordia's English 212 course (testing is available through Concordia University's English Department—please contact that Department for further details).

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** Students may select one of two options, A or B, outlined below.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative Grade Point Average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** If one "C" grade is received it will count toward the required or optional courses in the program. However, if a student receives a second "C" grade, the case will be reviewed by the program's faculty Committee which will recommend to the School of Graduate Studies whether the student shall be permitted to continue in the program. If allowed to continue, the student must either repeat one of the courses that was granted a "C" or register for an acceptable substitute approved by the Graduate Program Director. If any further "C" grades are received, the student will be withdrawn from the program. Students who have been withdrawn may apply for re-admission.
- **F Rule.** Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the School of Graduate Studies. Students who have been withdrawn may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts with Thesis (Option A)

All students must: 1. take APLI 604, APLI 621, APLI 660 (9 credits); 2. take 3 credits from each of the three clusters (9 credits); 3. take 6 additional credits from any of the clusters, electives, or courses approved by the Graduate Program Director; 4. write a thesis proposal, APLI 690 (3 credits); 5. write a thesis, APLI 691 (18 credits). Up to 9 credits from other departments or universities may be credited toward the degree.

Master of/Magisteriate in Arts without Thesis (Option B)

All students must: 1. take APLI 604, APLI 621, APLI 660 (9 credits); 2. take 6 credits from each of the three clusters (18 credits); 3. take 12 additional credits from any of the clusters, electives, or courses approved by the Graduate Program Director; 4. write a research paper, APLI 696 (6 credits). Up to 9 credits from other departments or universities may be credited toward the degree.

Core Courses

All students must take the following core courses: APLI 604, APLI 621, APLI 660.

APLI 604 Applied Language Studies (3 credits)
Prerequisite: TESL 221 or TESL 231 or equivalent.
This course examines the different theoretical concepts and methods used to analyze and describe the linguistic structure of language, and explores ways in which these can be applied to the teaching of second languages. The course introduces students to the key concepts that characterize the different components of language, namely phonology, morphology, syntax and semantics, within an approach that recognizes that languages can be affected by the social, psychological, and pragmatic aspects of human behaviour.

APLI 621 Issues in Second Language Acquisition (3 credits)
Prerequisite: TESL 341 or equivalent.
Research in second language acquisition (SLA) is surveyed in this course. Students read, critique, and discuss a number of research reports and survey articles on topics including research techniques in SLA, individual differences believed to affect success in second language learning (e.g., age, motivation), the systematicity of learner language (interlanguage, developmental sequences), the influence of learners' first language on the structure of their interlanguage, the development of general theories of SLA. The course concludes with a discussion of SLA research carried out in classroom settings.

APLI 660 Research Methods (3 credits)
The principal aims of the course are to enable students better to evaluate reports of empirical research in the language sciences and to plan limited studies of their own. Emphasis will be placed upon the logic of research designs, the nature of scientific proof, and the assumptions underlying data analytic procedures.

Case studies of published research, readings and lectures will illustrate the concepts of data, scales, models, sampling, theory, description, estimation and significance testing.

Cluster Courses

Thesis students take a minimum of one course from each cluster; non-thesis students take a minimum of two courses from each cluster.

Cluster A: Theoretical Perspectives on Second Language Acquisition

APLI 623 Sociolinguistic Aspects of Bilingualism and Multilingualism
Prerequisite: TESL 341 or equivalent.
This course is an introduction to educational and sociolinguistic issues affecting the promotion and maintenance of individual and societal bilingualism, multilingualism, and multiculturalism. The societal consequences of being multilingual and multicultural and the perspectives of both students and educators in multilingual/multicultural language classrooms will be examined.
Note: Students who have received credit for APLI 642 may not take this course for credit.

APLI 624 Psycholinguistic Aspects of Second Language Acquisition
Prerequisites: TESL 341 (or equivalent); APLI 660 (previously or concurrently).
This course examines issues in second language acquisition and bilingualism/multilingualism from a cognitive (psycholinguistic) perspective. The aim of the course is to familiarize students with basic psycholinguistic concepts of language representation and use, focusing on the learning of different aspects of language, the role of attention and memory in language acquisition, the development of language comprehension and production skills, and the cognitive consequences of bilingualism/multilingualism. Throughout the course, emphasis is given to understanding research methodologies used in psycholinguistic investigations.
Note: Students who have received credit for APLI 642 may not take this course for credit.

APLI 634 Cross-Linguistic Influence
Prerequisite: TESL 341 or equivalent.
This course provides an overview of different perspectives that have been taken on the ways previously learned languages affect the learning of subsequent languages. Topics include: the contrastive analysis and error analysis approaches; avoidance; markedness; selective, bidirectional, and conceptual transfer; and factors affecting cross-linguistic influence among trilingual and multilingual speakers. Throughout the course, the implications for language teaching of the theoretical perspectives and empirical findings are considered.

Cluster B: Focus on Language

APLI 601 Phonological Aspects of Second Language Acquisition

Prerequisite: APLI 604 (previously or concurrently).

This course is an introduction to second language phonology, with emphasis on how theoretical knowledge and research can be applied to the teaching of pronunciation in traditional and computer-based environments. This course familiarizes students with the English sound system and associated phonetic phenomena, research in the development of second language phonology, and key concepts in phonemic representation, production and perception.

APLI 610 Teaching and Learning Second Language Vocabulary

Prerequisite: TESL 341 (or equivalent) or APLI 604.

The course provides an overview of research perspectives on second language vocabulary acquisition. Topics include the characteristics of lexis, the structure of the mental lexicon, implicit and explicit learning, and issues in assessment. The course also outlines a research-informed approach to instruction: in addition to examining both old and new techniques for teaching vocabulary, it explores developments in corpus linguistics that are relevant to vocabulary instruction and materials design.

APLI 616 Pedagogical Grammar

Prerequisite: APLI 604 (previously or concurrently).

This course surveys the theoretical and empirical literature related to the teaching and learning of grammar in second language classrooms. Topics include the nature of pedagogical rules, the use of metalinguistic terminology, teachers' knowledge and beliefs, learner characteristics, task types, and sequencing. Students also study a grammar structure in depth for which they subsequently develop, pilot, and critically evaluate a set of instructional materials.

Cluster C: Focus on the Classroom

APLI 630 Second Language Syllabus Design and Curriculum Planning

Prerequisite: TESL 324 or TESL 424 or equivalent.

The aims of the course are to examine the evolution of the syllabus in second language teaching and to consider issues related to the development, planning and implementation of language programs in a range of educational settings. Topics include the history of second language teaching; current issues in pedagogical practice; assessment of student needs; and the design, sequencing, and evaluation of language teaching materials.

Note: Students who have received credit for APLI 638 may not take this course for credit.

APLI 635 Language Assessment

Prerequisite: TESL 324 or TESL 424 or equivalent.

The course provides an overview of theory and research that informs language testing. Students explore historical developments in language assessment as well as current trends. The course enables them to

critically evaluate a range of test types including standardized placement instruments, diagnostic tests, progress/achievement measures, and non-traditional assessment techniques. Students are guided in designing sample tests; they are also familiarized with established methods for analyzing test items and interpreting results.

APLI 644 Technology in Language Learning
Prerequisite: TESL 341 or equivalent.
This course explores theoretical and applied issues related to the use of technology in second language learning and teaching. The principal aims of the course are to enable students to critically evaluate existing instructional uses of technology and to design methodologically sound technology-based materials for second language teaching. Emphasis is placed on developing skills needed for the integration of instructional technology into second language instruction.

Elective Courses

Each year the department offers a selection of courses from those listed below. All courses are worth 3 credits unless otherwise noted.

APLI 613 History of the English Language
APLI 643 Pragmatics and Second Language Acquisition
APLI 646 Literacy
APLI 647 Supervision of Practice Teaching
APLI 651 Special Topics in Applied Linguistics I
APLI 652 Special Topics in Applied Linguistics II
APLI 653 Special Topics in Applied Linguistics III
APLI 654 Special Topics in Applied Linguistics IV
APLI 655 Special Topics in Applied Linguistics V
APLI 656 Special Topics in Applied Linguistics VI (6 credits)
APLI 671 Reading Course in Applied Linguistics I
APLI 672 Reading Course in Applied Linguistics II
APLI 673 Reading Course in Applied Linguistics III
APLI 674 Reading Course in Applied Linguistics IV
APLI 675 Reading Course in Applied Linguistics V (6 credits)

Thesis

APLI 690 Thesis Proposal (3 credits)
APLI 691 Thesis (18 credits)
APLI 696 Research Paper (6 credits)

English

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English Website

Master of/Magisteriate in Arts (English)

Admission Requirements. The Master of Arts program, with the exception of the Creative Writing option, requires an Honours degree or its equivalent in English with a minimum of a *B*+ (3.30 GPA) average. The Creative Writing option requires a major in English Literature or its equivalent with a minimum of a *B*+ (3.30 GPA) average, together with a portfolio (five copies) of the applicant's literary work. The portfolio will be evaluated. Details about the composition of the portfolio may be obtained from the Graduate Program Director. Portfolios will not be returned to applicants but may be picked up. Applicants who lack one or two courses (12 credits or less) towards equivalency of an Honours degree, but who are otherwise well qualified, may be admitted with the provision that they take additional undergraduate courses as part of their master's program. Applicants requiring three or more courses (more than 12 credits) to complete the Honours equivalent will be required to take a qualifying program of prescribed undergraduate courses, and reapply to the master's program after successful completion of this course work. Applicants should feel free to consult with all members of the English Department about the program. Specific matters should be addressed to the Graduate Program Director or to the Graduate Program Assistant.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** All options have a minimum residence requirement of three terms of full-time study or the equivalent in part-time study.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

- **C Rule.** Students in master's programs are allowed to receive no more than one *C* grade to remain in good standing in the University (six credits). In Option C, if a student has more than three credits of *C* grades in Creative Writing courses, but not more than six, the credits in excess of three must be replaced by additional course work.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts — English Literature with Research Essay (Option A)

This option gives the student the opportunity to study English literature in a range of periods and subjects. Emphasis rests on course work, the seminar format of which encourages discussion, debate and collaboration. A fully qualified candidate takes a minimum of twenty-one 600-level course credits. In these courses the student is trained in academic research methods, gains knowledge to interpret literary texts and assess scholarship in particular fields, and applies these skills in graduate research papers. A fully qualified candidate is required to take a minimum of six credits from any courses designated by the Graduate Committee as fulfilling the "Period" requirement, and a minimum of three credits from any courses designated as fulfilling the "Theory" requirement. This option requires the preparation of an annotated bibliography of approximately three thousand words (ENGL 693, 6 credits) preliminary to a research essay of approximately ten thousand words (ENGL 694, 18 credits). The bibliography requires the approval of the Graduate Committee before a student is permitted to proceed with the research essay. Both are supervised by a member of the department. The bibliography must be submitted to the Graduate Committee by 15 September of the second year. The research essay is submitted by 1 February for spring graduation and 15 June for fall graduation. The research essay is assessed by the supervisor and one other member of the department.

Master of/Magisteriate in Arts — English Literature with Thesis (Option B)

This option involves course work and intensive research on an original topic, approved by the Graduate Committee. In this option, a fully qualified candidate is required to take a minimum of 21 credits at the 600-level including a minimum of six credits from any courses designated by the Graduate Committee as fulfilling the "Period" requirement, and a minimum of three credits from any courses designated as fulfilling the "Theory" requirement. A candidate electing the thesis option must satisfy the Graduate Committee of the viability of the topic and secure a member of the department to supervise the thesis. The English

Department cannot guarantee the availability of a supervisor on every possible topic. The candidate will make an oral defence of the thesis. Theses must be submitted to the department by May 15 for Fall graduation and by February 1 for Spring graduation. For specific information concerning thesis proposals a student should consult the departmental guidelines. University regulations regarding the thesis may be found in the thesis section of this calendar. For purposes of registration, this work will be designated as ENGL 690 (Thesis).

Master of/Magisteriate in Arts in English — Creative Writing (Option C)

To elect this option a candidate must have applied specifically for the Creative Writing option. A fully qualified candidate will take a minimum of 12 600-level credits from the regular academic course offerings, and 12 course credits in creative writing drawn from courses numbered 670-674 (ENGL 670 and ENGL 671 are Creative Writing courses). Only six credits of creative writing workshop (from ENGL 672, 673 or 674) may be elected in any year. A creative writing thesis of book length, the proposal of which requires approval by the Graduate Committee, must be submitted to the department by May 15 for Fall graduation and by February 1 for Spring graduation. For purposes of registration, this work will be designated as ENGL 692 (Creative Writing Thesis).

Creative Writing Option students may **NOT** substitute creative writing courses for any of the required 12 course credits of academic credits.

Note: In addition to the regulations governing the examination of master's theses outlined in this calendar, the Department of English has specific procedures for thesis examinations. Students should consult the Graduate Program Director for details.

Descriptions of all English Department graduate courses can be found at the Department of English website. English graduate courses are offered in the following topic areas:

ENGL 600-604 Special Topics in English Literature
ENGL 605-609 Studies in Early English Literature and Medieval Literature
ENGL 610-614 Studies in Renaissance Literature
ENGL 615-619 Studies in Restoration and Eighteenth Century Literature
ENGL 620-624 Studies in Nineteenth Century Literature
ENGL 625-629 Studies in Twentieth Century Literature
ENGL 630-634 Studies in Poetry
ENGL 635-639 Studies in Drama
ENGL 640-644 Studies in Fiction
ENGL 645-649 Studies in the History of Ideas
ENGL 650-654 Studies in Shakespeare

ENGL 655-659 Studies in American Literature
ENGL 660-664 Studies in Canadian Literature
ENGL 665-669 Studies in Literary Criticism
ENGL 670-674 Seminars in Creative Writing: Prose Fiction, Poetry and Drama
ENGL 678-679 Studies in Selected Areas
ENGL 685-689 Studies in Selected Areas

Please note that in courses where a *Special Subject* is listed, this *Special Subject* is a subtitle, and may change from year to year. Consequently, when students repeat a course number in subsequent years, but with a different subtitle, they are in fact engaged in a course with completely different content. The credit value attached to a course number may likewise change from year to year.

Note: Courses in Creative Writing are normally available only to students admitted into the Creative Writing option. Occasional exceptions in special circumstances are made for entry by students in the academic options. Such entrants require the prior approval of the Graduate Program Director.

Independent (non-degree) students require the permission of the Graduate Program Director to take a course and they must possess the same kind and quality of academic background and preparation as required of students admitted to the MA program.

Studies in Selected Areas

ENGL 678 Selected Area I
Creative Writing Tutorial (one-term, 3-credit course).

ENGL 679 Selected Area II
Creative Writing Tutorial (two-term, 6-credit course). The Creative Writing tutorials may be elected only by students in Option C. They are designed to accommodate candidates whose genre (e.g., poetry or drama) is not offered during a given academic year. Candidates wishing to enrol in ENGL 678 or 679 must submit a request to the Graduate Committee. Approval will in part depend upon the availability of resources and whether the Graduate Committee deems it beneficial for the student to undertake a tutorial course rather than a regularly scheduled course. Tutorial courses will be considered only exceptionally and for very able students.

ENGL 685 Selected Area III

ENGL 687 Selected Area IV
Bibliography and Research Methods in English. An introduction to scholarly research in English (one-term, 3-credit course).

ENGL 688 Selected Area V
Reading Course (one-term, 3-credit course).

ENGL 689 Selected Area VI
Reading Course (two-term, 6-credit course). After completing at least a third of the course credits (transfer credits excluded), a student may submit a request to the Graduate Committee for permission to take up to 6 credits in a reading course to be provided through a tutorial arrangement. A reading course will be permitted only when the proposed general subject area has not been available during the span of the student's program and where the Graduate Committee is satisfied that it is beneficial for the student to take a reading course rather than a regularly scheduled graduate course. Reading courses are approved only exceptionally and only students who have demonstrated a capacity for independent work and a very high calibre of academic performance will be considered. This applies to both English 688 and English 689.

Thesis, Bibliography and Research Essay

ENGL 690 Thesis (24 credits)

ENGL 692 Creative Writing Thesis (21 credits)

ENGL 693 Bibliography (6 credits)
The annotated bibliography constitutes a preliminary phase of the research essay. A student must successfully complete the annotated bibliography before producing the research essay. The approximate length of the annotated bibliography is 3,000 words and is supervised by the supervisor of the research essay. The bibliography is assessed on a pass/fail basis.

ENGL 694 Research Essay (18 credits)
Prerequisite: ENGL 693.
A research essay of approximately 10,000 words is supervised by a member of the department and assessed by another faculty member acting as reader. The essay is assessed on a pass/fail basis.

Études françaises

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Études françaises Website

Maîtrise en littératures francophones et résonances médiatiques (Master of/Magisteriate in Arts)
Maîtrise en traductologie (Master of/Magisteriate in Arts)
Diplôme en traduction
Certificat anglais-français en langue et techniques de localisation

Maîtrise en littératures francophones et résonances médiatiques (Master of/Magisteriate in Arts)

Les étudiantes et étudiants à temps plein réaliseront normalement leur cycle complet d'études en deux ans et les étudiantes et étudiants à temps partiel disposeront d'un maximum de cinq années. Le nombre total de crédits est de 45 : 6 crédits de séminaires obligatoires, 12 crédits de séminaires généraux, 6 crédits pour la présentation du projet de mémoire et 21 crédits pour la réalisation du mémoire.

Les étudiantes et étudiants à temps plein suivent normalement trois séminaires par session; les étudiantes et étudiants à temps partiel suivent un ou deux séminaires par session pendant quatre sessions. Le mémoire est réalisé une fois le cycle des séminaires achevé. Il peut prendre soit la forme d'un mémoire **(Option A)** soit la forme d'un projet innovateur de diffusion **(Option B)** choisi par le candidat ou la candidate en fonction de son expérience, de ses études antérieures ou de son intérêt propre.

Conditions d'admission

Pour être admis à la maîtrise en littératures francophones et résonances médiatiques, la candidate ou le candidat doit être titulaire de l'un des diplômes suivants :

- Baccalauréat spécialisé (ou « Honours ») en littératures de langue française ou dans une discipline connexe, avec une moyenne générale de 3,00 (sur 4,3); ou
- Baccalauréat avec majeure en littératures de langue française ou dans une discipline connexe, avec une moyenne générale de 3,00 (sur 4,3); ou

- Baccalauréat avec une mineure en littératures de langue française couplée à une majeure dans une discipline connexe avec une moyenne générale de 3,00 (sur 4,3). Dans ce cas, quelques cours de propédeutique devront être envisagés.

La demande d'admission doit s'accompagner des pièces suivantes :

- Les relevés de notes officiels des universités fréquentées.
- Trois lettres de recommandation.
- La lettre de présentation.

La sélection des candidatures est effectuée sur la base des éléments suivants :

- Le dossier universitaire du candidat ou de la candidate.
- Les réalisations du candidat ou de la candidate.
- La lettre de présentation.
- Les lettres de recommandation.
- Une entrevue qui vérifiera l'intérêt de l'étudiant ou l'étudiante pour ce programme.

Durée des études

La durée des études est d'un minimum de trois sessions à temps plein.

Exigences du programme

Tout candidat doit obtenir un minimum de 45 crédits. Toute note inférieure à *C* constitue un échec. Obtenir deux *C* constitue également un échec. Le comité d'études supérieures du département revoit annuellement le dossier de tous les étudiants et étudiantes et peut exiger que ceux et celles dont les résultats ne satisfont pas aux normes du département (moyenne générale de 3,00 sur 4,3) se retirent du programme.

Le choix du directeur de mémoire doit idéalement être fait à la fin du premier session d'études pour les étudiants à temps plein, et après trois séminaires pour les étudiants à temps partiel.

Le projet de mémoire doit être déposé au plus tard un session après la fin de la scolarité pour les étudiants à temps plein et à temps partiel.

Le projet de mémoire sera accepté ou refusé. En cas de refus, l'étudiant ou l'étudiante bénéficiera d'un délai de trois mois pour soumettre une version remaniée de son projet.

Structure du programme

Tous les étudiants et étudiantes sont tenus à 18 crédits de séminaire, 6 crédits de présentation de mémoire et 21 crédits de thèse (mémoire ou réalisation médiatique en diffusion littéraire).

Maîtrise en littératures francophones et résonances médiatiques, avec mémoire (OPTION A)

45 crédits :

- 18 crédits de séminaires
- 6 crédits pour la présentation du projet de mémoire devant le comité des études supérieures
- 21 crédits pour le mémoire

Répartition des 18 crédits de séminaires :

- 6 crédits de séminaires obligatoires
- 12 crédits de séminaires de domaines généraux

Maîtrise en littératures francophones et résonances médiatiques, avec mémoire sous forme de réalisation médiatique en diffusion littéraire (OPTION B)

45 crédits :

- 18 crédits de séminaires
- 6 crédits pour la présentation du projet de mémoire sous forme de réalisation médiatique devant le comité des études supérieures
- 21 crédits pour la réalisation du mémoire sous forme de réalisation médiatique en diffusion littéraire, tel qu'il a été approuvé par le comité des études supérieures

Répartition des 18 crédits de séminaires :

- 6 crédits de séminaires obligatoires
- 12 crédits de séminaires de domaines généraux

Séminaires

Séminaires obligatoires

FLIT 600 Méthodes de recherche et de production littéraire (3 crédits)
FLIT 601 Étude des objets littéraires et du discours (3 crédits)

Séminaires de domaines généraux *

FLIT 602 Littératures des espaces francophones (3 crédits)
FLIT 603 Littératures et professions (3 crédits)
FLIT 604 Littérature et linguistique (3 crédits)
FLIT 612 Discours du pouvoir dans les œuvres littéraires (3 crédits)
FLIT 613 Littératures traduites en français (3 crédits)
FLIT 614 Littérature et environnement technologique (3 crédits)
FLIT 615 Métadiscours dans les œuvres littéraires (3 crédits)
FLIT 617 Rhétorique du texte/rhétorique de l'image : leurs rapports dans les œuvres littéraires (3 crédits)
FLIT 619 Production et réception du littéraire (3 crédits)
FLIT 620 Tutorat en littérature (3 crédits)
FLIT 621 Tutorat en littérature (3 crédits)
FLIT 622 Séminaire avancé en littérature, langue et traduction (3 crédits)
Co-listé : FTRA 622.
FLIT 630-639 Séminaire avancé en littérature francophone (3 crédits)
FLIT 640-649 Séminaire avancé en littérature québécoise (3 crédits)
FLIT 650-659 Séminaire avancé en écritures contemporaines (3 crédits)

Autres exigences

FLIT 690 Présentation du mémoire (OPTION A) (6 crédits)
FLIT 691 Présentation du mémoire incluant une réalisation médiatique (OPTION B) (6 crédits)
FLIT 692 Mémoire (OPTION A) (21 crédits)
FLIT 693 Mémoire incluant une réalisation médiatique (OPTION B) (21 crédits)

* Les séminaires de domaines généraux peuvent être suivis dans un autre département de l'Université Concordia ou dans d'autres universités, avec l'accord du directeur ou de la directrice du programme de deuxième cycle en littérature et celui du département concerné. Pour les deux options, un maximum de trois crédits de séminaires non obligatoires peut être remplacé par une lecture dirigée après l'obtention de la permission du directeur ou de la directrice du 2e cycle de littérature.

FLIT 600 Méthodes de recherche et de production littéraire (3 crédits)
Dans ce séminaire, conçu comme un lieu d'échanges où l'étudiante ou l'étudiant apprend à formuler des problématiques et à discuter d'hypothèses de recherche, on souhaite à la fois familiariser l'étudiante ou l'étudiant avec les outils de recherche bibliographique imprimés et informatiques, les règles de présentation de la bibliographie et les principaux types de productions écrites liées à la critique littéraire. De plus, on souhaite lui permettre d'amorcer une réflexion d'ordre théorique sur la littérature et les enjeux contemporains qui s'y rattachent.

FLIT 601 Études des objets littéraires et du discours (3 crédits)
Ce séminaire permet à l'étudiante ou à l'étudiant d'approfondir ses connaissances en théories et critiques littéraires afin de parfaire sa formation méthodologique, son jugement critique et sa sensibilité au littéraire. À partir des différents objets de recherche et approches critiques étudiés, le séminaire vise également à explorer le passage de la théorie à la mise en pratique dans l'analyse du discours.

FLIT 602 Littératures des espaces francophones (3 crédits)
Ce séminaire permet à l'étudiante ou à l'étudiant d'approfondir ses connaissances sur les œuvres littéraires produites dans les différents contextes culturels et sociaux de la francophonie. Ainsi, l'étudiante ou l'étudiant abordera certaines des problématiques touchant ces espaces comme le canon et le contre-canon littéraire, le postcolonialisme, l'hybridation, la marginalité et la dynamique des genres littéraires.
N.B. : Les étudiantes et étudiants qui ont suivi FLIT 611 ne peuvent obtenir de crédits pour ce cours.

FLIT 603 Littérature et professions (3 crédits)
Ce séminaire propose une réflexion sur l'ancrage du littéraire dans les milieux professionnels tels que enseignement, édition, rédaction, révision, publicité et autres professions. L'étudiante ou l'étudiant est ainsi amené à réfléchir aux enjeux liés aux différentes professions du domaine littéraire.
N.B. : Les étudiantes et étudiants qui ont suivi FLIT 618 ne peuvent obtenir de crédits pour ce cours.

FLIT 604 Littérature et linguistique (3 crédits)
Le développement de l'analyse du discours, inspirée par les théories de l'énonciation, enrichit la réflexion sur les textes littéraires et sur la fonction poétique du langage. Dans ce séminaire seront considérés différents aspects du recours à la linguistique dans l'approche des énoncés littéraires.

FLIT 612 Discours du pouvoir dans les œuvres littéraires (3 crédits)
Dans l'espace littéraire s'inscrivent des tensions de toutes sortes par lesquelles surgit le discours des pouvoirs. Il s'agira, dans ce séminaire, d'analyser les discours complexes du pouvoir pour en saisir les thématiques principales, comme la violence, l'intolérance ou la peur.

FLIT 613 Littératures traduites en français (3 crédits)
Ce séminaire propose d'aborder les littératures traduites en français et d'étudier les œuvres en fonction d'une problématique littéraire ou linguistique. On analysera un corpus pouvant réunir des ouvrages qui appartiennent à des genres, à des périodes ou à des supports divers. Il s'agira d'en situer l'originalité et la pertinence dans le contexte des préoccupations et des recherches actuelles.

FLIT 614 Littérature et environnement technologique (3 crédits)
Les technologies ajoutent une dimension nouvelle à la production et à la diffusion de la littérature et entraînent sa réévaluation. Dans ce séminaire, l'étudiante ou l'étudiant sera amené à réfléchir à ce phénomène et à poser un regard critique sur l'impact des technologies sur la littérature.

FLIT 615 Métadiscours dans les œuvres littéraires (3 crédits)
Ce séminaire examine l'un des traits typiques de la modernité soit la réflexivité du discours littéraire. Ce séminaire pourrait être l'occasion d'interroger l'écrivain comme lecteur de son œuvre ou encore d'étudier des figures d'écrivains imaginaires telles qu'elles sont représentées dans la littérature.

FLIT 617 Rhétorique du texte/rhétorique de l'image : leurs rapports dans les œuvres littéraires (3 crédits)
Ce séminaire se propose d'analyser les rapports rhétoriques du texte et de l'image sous l'angle du pictural et du filmique intégré au scriptural. Comme ce sont des systèmes de signes différents qui possèdent leur rhétorique propre, il s'agira d'examiner comment la narratologie du texte s'approprie des dispositifs de ces autres systèmes. Dans ce séminaire seront abordés des textes qui incorporent le visuel ou qui en dépendent, comme les textes littéraires illustrés et les bandes dessinées.

FLIT 619 Production et réception du littéraire (3 crédits)
Ce séminaire est, pour l'étudiante ou l'étudiant, l'occasion de réfléchir à l'une des problématiques fondatrices de la littérature : le rapport entre l'œuvre et son public. On y examine, dans une perspective historique, divers contextes de production, de diffusion, de réception ou de conservation du texte littéraire.

FLIT 620 Tutorat en littérature (3 crédits)

FLIT 621 Tutorat en littérature (3 crédits)

FLIT 622 Littérature, langue et traduction (3 crédits)
Co-listé : FTRA 622.
Le séminaire avancé de littérature, langue, et traduction vise à parfaire les connaissances de l'étudiante et de l'étudiant dans un domaine littéraire, traductologique ou linguistique spécifique envisagé sous un angle théorique, historique ou social. Pour animer ce séminaire, il sera fait appel aux professeurs du département en fonction de leur spécialité. Le sujet particulier du séminaire sera annoncé chaque fois que le séminaire sera donné.
N.B. : Les étudiantes et étudiants qui ont suivi FLIT 616 ou FTRA 616 ou FTRA 622 ne peuvent obtenir de crédits pour ce cours.

FLIT 630-639 Séminaire avancé en littérature francophone (3 crédits)
Ce séminaire avancé vise à parfaire les connaissances de l'étudiante et de l'étudiant par une analyse en profondeur d'une thématique et d'un corpus particulier de la littérature francophone.

FLIT 640-649 Séminaire avancé en littérature québécoise (3 crédits)
Ce séminaire avancé vise à parfaire les connaissances de l'étudiante et de l'étudiant par une analyse en profondeur d'une thématique et d'un corpus particulier de la littérature québécoise.

FLIT 650-659 Séminaire avancé en écritures contemporaines (3 crédits)
Ce séminaire avancé vise à parfaire les connaissances de l'étudiante et de l'étudiant par une analyse en profondeur d'une thématique et d'un corpus particulier des écritures contemporaines.

FLIT 690 Présentation du mémoire (Option A) (6 crédits)

FLIT 691 Présentation du mémoire incluant une réalisation médiatique (Option B) (6 crédits)

FLIT 692 Mémoire (Option A) (21 crédits)

FLIT 693 Mémoire incluant une réalisation médiatique (Option B) (21 crédits)

Maîtrise en traductologie (Master of/Magisteriate in Arts)

Les étudiantes et étudiants à temps plein réaliseront normalement leur cycle complet d'études en deux années et les étudiantes et étudiants à temps partiel disposeront d'un maximum de cinq années. Le nombre total de crédits est de 45 : 18 crédits de séminaire, 3 crédits pour la présentation du projet de mémoire et 24 crédits de mémoire. Les séminaires obligatoires (12 crédits) portent sur les méthodes, les problématiques et l'histoire; les séminaires en option (6 crédits à choisir) portent sur la critique, les genres et discours ainsi que sur la traduction littéraire et la traduction en sciences humaines.

Les étudiantes et les étudiants à temps plein suivent normalement trois séminaires par session; les étudiantes et les étudiants à temps partiel suivent deux séminaires par session pendant quatre sessions. Le mémoire se fait une fois le cycle des cours et séminaires achevé; il pourra prendre soit la forme d'un travail de réflexion théorique ou historique sur un corpus de traductions, soit la forme d'une traduction littéraire accompagnée d'un appareil critique important.

Conditions générales d'admission

Baccalauréat spécialisé (ou « Honours ») en traduction; baccalauréat (ou diplôme supérieur) dans un domaine pertinent à la traduction, avec propédeutique, au besoin; ou diplôme de 2e cycle en traduction. Dans tous les cas, la moyenne générale obtenue sera d'au moins 3,00 (sur 4,3).

La demande d'admission doit s'accompagner des pièces suivantes :

- Trois lettres de recommandation.
- Une lettre de présentation où le candidat décrit sa formation et son expérience antérieures ainsi que ses attentes à l'égard du programme.
- Des relevés de notes officiels de l'université ou des universités fréquentées.

La sélection des candidatures est effectuée sur la base des éléments suivants :

- Le dossier universitaire du candidat ou de la candidate.
- Les lettres de recommandation.
- Un examen d'admission qui vérifie les compétences linguistiques et culturelles du candidat ou de la candidate.

Durée des études

La durée des études pour les étudiantes et étudiants à temps plein est d'un minimum de trois sessions et d'un maximum de douze sessions à partir de la date d'inscription. Pour les étudiantes et étudiants à temps partiel, le maximum est de quinze sessions.

Exigences du programme

Toute étudiante ou tout étudiant doit obtenir un minimum de 45 crédits.

Toute note inférieure à *C* constitue un échec. Obtenir deux *C* constitue également un échec. Le comité des études supérieures du département revoit le dossier de chaque étudiante et de chaque étudiant tous les ans et peut exiger que ceux et celles dont les résultats ne satisfont pas aux normes du département (moyenne générale de 3,0 sur 4,3) se retirent du programme.

Structure du programme

Toute étudiante ou tout étudiant est tenu à 18 crédits de séminaires, 3 crédits de présentation du projet de mémoire et 24 crédits de mémoire.

Séminaires obligatoires : 12 crédits
Séminaires à option : 6 crédits
Projet de mémoire : 3 crédits
Mémoire : 24 crédits

Cours

Les cours obligatoires sont des séminaires de fondement théorique et d'histoire de la traduction. Les cours au choix sont des séminaires spécialisés dans le domaine sociocritique et des séminaires de traduction en littérature et en sciences humaines.

Cours obligatoires

FTRA 600 Méthodologie générale de la recherche en traduction (3 crédits)
FTRA 601 Courants contemporains en traductologie (3 crédits)
FTRA 602 Histoire générale de la traduction (3 crédits)
FTRA 603 Contextes socio-politiques de la traduction (3 crédits)

Cours au choix

FTRA 610 Lecture critique de traductions (3 crédits)
FTRA 612 Traduction avancée en sciences humaines et sociales (F) (3 crédits)
FTRA 613 Advanced translation in social sciences and the humanities (A) (3 crédits)
FTRA 614 Traduction littéraire avancée (F) (3 crédits)
FTRA 615 Advanced literary translation (A) (3 crédits)
FTRA 619 Sociologie de la traduction littéraire (3 crédits)
FTRA 622 Littérature, langue, traduction (3 crédits)
Co-listé : FLIT 622.
FTRA 680 Tutorat en littérature (F) (3 crédits)
FTRA 681 Tutorial in literature (A) (3 crédits)
FTRA 682 Tutorat en traduction (F) (3 crédits)
FTRA 683 Tutorial in translation (A) (3 crédits)
FTRA 684 Tutorat en linguistique (F) (3 crédits)
FTRA 685 Tutorial in linguistics (A) (3 crédits)
FTRA 698 Étude d'un sujet particulier / Special Topics (3 crédits)

Autres exigences

FTRA 686 Projet de mémoire (3 crédits)
FTRA 692 Mémoire (24 crédits)

Note : Les étudiantes et étudiants admis avant 2002-2003 et qui ont préféré rester dans l'ancien programme peuvent suivre FTRA 690 (21 crédits) à condition d'avoir satisfait aux exigences de l'ancien programme.

Les étudiantes et les étudiants admis en maîtrise peuvent bénéficier d'une aide financière pendant la durée de leurs études, sous la forme d'assistanats de recherche ou d'enseignement. Ces aides varient selon les années et les étudiantes et étudiants intéressés doivent se faire connaître auprès de la direction du programme une fois admis.

FTRA 600 Méthodologie générale de la recherche en traduction (3 crédits)
Co-listé : FTRA 500.
Ce séminaire examine les principales méthodes et approches appliquées à l'étude de la traduction et

héritées des sciences humaines et sociales. Ce tour d'horizon débouche sur des questions liées à la conceptualisation en traductologie : quelle est la place de l'historicité dans la théorisation du savoir sur la traduction? La traductologie doit-elle s'autonomiser et construire une méthodologie spécifique par rapport aux autres sciences humaines? À quelles conditions cette construction est-elle possible? À l'issue du séminaire, l'étudiante ou l'étudiant aura une vue d'ensemble de la théorisation en traduction, ce qui lui permettra de se spécialiser en connaissance de cause dans une problématique particulière cohérente avec les visées du programme.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 500 ne peuvent obtenir de crédits pour ce cours.

FTRA 601 Courants contemporains en traductologie (3 crédits)
Co-listé : FTRA 539.
Ce séminaire est axé sur les approches théoriques récentes, par exemple la théorie féministe, le déconstructionnisme, l'anthropologie culturelle appliquées à la théorisation de la traduction. Ces approches, chacune à leur échelle, mettent en discussion diverses notions traditionnelles - l'ethnicité, l'identité, la culture nationale - et conduisent à redéfinir ce qui est tenu, au XXI^{e} siècle, comme l'un des fondements spécifiques de la traduction, le transfert culturel. Ainsi, ce séminaire engagera l'étudiante ou l'étudiant à reconceptualiser la traduction dans des cadres contemporains définis, par exemple celui du post-colonialisme ou celui de la circulation accélérée des flux d'information par les moyens techniques modernes, notamment informatiques.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 539 ne peuvent obtenir de crédits pour ce cours.

FTRA 602 Histoire générale de la traduction (3 crédits)
Ce séminaire est une introduction à l'histoire générale de la traduction, telle qu'elle apparaît dans ses continuités et dans ses discontinuités chronologiques notamment (mais non exclusivement) en Occident. Une vue en coupe est présentée à travers des thématiques permettant de dégager le rôle historique joué par les traducteurs comme acteurs sociaux proches des pouvoirs en place ou critiques de ces pouvoirs. L'accent sera mis sur la créativité des traducteurs à certaines époques clés de contacts de cultures. Le séminaire pourra aborder une période historique et une aire géographique données, par exemple la traduction dans la propagation des religions et l'« évangélisation » des premières Nations dans la colonisation de l'Amérique.

FTRA 603 Contextes socio-politiques de la traduction (3 crédits)
Co-listé : FTRA 553.
Ce séminaire examine les théories qui rendent compte du travail pratique du traducteur et de la réception de la traduction du point de vue socio-politique. Sont examinés, par exemple, les effets de la localisation en traduction, les cas de bilinguisme et de multiculturalisme dans le monde, le statut juridique des langues dominantes et minoritaires, l'évolution des politiques linguistiques et leurs répercussions sur la traduction, la concurrence des langues internationales et les marchés nouveaux de la traduction.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 553 ou FTRA 550 ne peuvent obtenir de crédits pour ce cours.

FTRA 610 Lecture critique de traductions (3 crédits)
Co-listé : FTRA 540.
Ce séminaire propose une étude critique des traductions de l'anglais au français et du français à l'anglais effectuée à travers l'histoire, en tenant compte de la diversité des visées esthétiques et des contraintes institutionnelles de la traduction. L'accent est mis sur l'étude des « grandes » traductions dans les cultures d'expression anglaise et française.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 540 ne peuvent obtenir de crédits pour ce cours.

FTRA 612 Traduction avancée en sciences humaines et sociales (F) (3 crédits)
FTRA 613 Advanced translation in social sciences and the humanities (A) (3 crédits)
Co-listé : FTRA 542 ou 543.
Ce séminaire pratique et théorique aborde plusieurs domaines des sciences humaines et sociales, notamment la sociologie, la psychanalyse, la théorie féministe. L'étudiante ou l'étudiant produit un commentaire analytique sur ses choix de traduction en s'efforçant de théoriser sa pratique de traducteur-traductrice. Le séminaire FTRA 612 a l'anglais comme langue de départ et le français comme langue d'arrivée (F); le séminaire FTRA 613 a le français comme langue de départ et l'anglais comme langue d'arrivée. (A)
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 542 ou FTRA 543 ne peuvent obtenir de crédits pour ce cours.

FTRA 614 Traduction littéraire avancée (F) (3 crédits)
FTRA 615 Advanced literary translation (A) (3 crédits)
Co-listé : FTRA 544 ou 545.
Ce séminaire pratique et théorique analyse, à partir de théories littéraires contemporaines, un échantillon de textes à traduire. L'étudiante ou l'étudiant produit un commentaire analytique sur ses choix de traduction en s'efforçant de théoriser sa pratique de traducteur-traductrice. Le séminaire FTRA 614 a l'anglais comme langue de départ et le français comme langue d'arrivée (F), le séminaire FTRA 615 a le français comme langue de départ et l'anglais comme langue d'arrivée. (A)
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 544 ou FTRA 545 ne peuvent obtenir de crédits pour ce cours.

FTRA 619 Sociologie de la traduction littéraire (3 crédits)
Co-listé : FTRA 549.
Ce séminaire applique la méthode sociologique à la traduction des genres et des discours de la littérature. Peuvent être étudiés des corpus divers (roman, poésie, théâtre, par exemple) traduits de l'anglais en français et du français en anglais. Seront examinées, par exemple, les théories de Pierre Bourdieu, de Niklas Luhmann ou de Bruno Latour. Le séminaire est l'occasion d'une remise en question des notions de source et de cible en traduction.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 611, FTRA 541 ou FTRA 549 ne peuvent obtenir de crédits pour ce cours.

FTRA 622 Littérature, langue, traduction (3 crédits)
Co-listé : FLIT 622.
Le séminaire avancé de littérature, langue et traduction vise à parfaire les connaissances de l'étudiante et de l'étudiant dans un domaine littéraire, traductologique ou linguistique spécifique envisagé sous un angle théorique, historique ou social. Pour animer ce séminaire, il sera fait appel aux professeurs du département en fonction de leur spécialité. Le sujet particulier du séminaire sera annoncé chaque fois que le séminaire sera donné.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 616, FLIT 616 ou FLIT 622 ne peuvent obtenir de crédits pour ce cours.

FTRA 680 Tutorat en littérature (F) (3 crédits)
FTRA 681 Tutorial in literature (A) (3 crédits)
FTRA 682 Tutorat en traduction (F) (3 crédits)
FTRA 683 Tutorial in translation (A) (3 crédits)
FTRA 684 Tutorat en linguistique (F) (3 crédits)
FTRA 685 Tutorial in linguistics (A) (3 crédits)

FTRA 698 Étude d'un sujet particulier / Special Topics (3 crédits)
Ce cours pourra porter sur tout sujet en littérature, traduction ou linguistique qui ne figure pas déjà au programme. Le but du cours est de favoriser une approche pluridisciplinaire et de permettre l'innovation pédagogique.

Autres exigences

FTRA 686 Projet de Mémoire (3 crédits)

FTRA 692 Mémoire (24 crédits)
L'étudiante ou l'étudiant pourra choisir d'étudier un sujet particulier en littérature, traduction ou linguistique, sous la forme d'un tutorat. Les tutorats devront être approuvés par le comité d'études supérieures et dépendront des aptitudes et intérêts de l'étudiante et de l'étudiant ainsi que de la disponibilité et des compétences du professeur concerné.

Nota : Les étudiantes et étudiants admis avant 2002-2003 et qui ont préféré rester dans l'ancien programme peuvent suivre FTRA 690 (21 crédits) à condition d'avoir satisfait aux exigences de l'ancien programme.

Diplôme en traduction

Conditions générales d'admission

Baccalauréat ou diplôme équivalent dans un domaine autre que la traduction. Dans tous les cas, la moyenne générale obtenue sera d'au moins 2,7 (sur 4,3). La sélection des candidatures est effectuée sur la base des documents suivants : un examen écrit, trois lettres de recommandation, le dossier universitaire, une lettre de présentation et, au besoin, une entrevue.

Durée des études

Les 33 crédits du programme peuvent être effectués en une année (3 sessions) ou à temps partiel. Pour être admissible à un stage de formation, l'étudiante ou l'étudiant doit avoir suivi 12 crédits en traduction pragmatique, 3 crédits en terminologie et avoir obtenu une moyenne générale cumulative d'au moins 3,3 soit *B*+.

Exigences du programme

Toute étudiante ou tout étudiant doit obtenir 33 crédits. Toute note inférieure à *C* constitue un échec. Obtenir deux *C* constitue également un échec. Le comité d'études supérieures du département revoit le dossier de chaque étudiante et de chaque étudiant tous les ans et peut exiger que ceux et celles dont les résultats ne satisfont pas aux normes du département (moyenne générale de 2,7 sur 4,3) se retirent du programme.

Cours

- **Cours obligatoires** (18 crédits)

  FTRA 501 Traduction littéraire du français à l'anglais (3 crédits)
  ou
  FTRA 504 Traduction littéraire de l'anglais au français (3 crédits)

  FTRA 532 Initiation à la traduction générale (3 crédits)

  FTRA 533 Aspects théoriques et pratiques de la terminologie (3 crédits)

  FTRA 536 Informatique et traduction (3 crédits)

  FTRA 500 Méthodologie générale de la recherche en traduction (3 crédits)
  ou
  FTRA 539 Courants contemporains en traductologie (3 crédits)
  ou
  FTRA 540 Lecture critique de traductions (3 crédits)

ou

FTRA 549 Sociologie de la traduction littéraire (3 crédits)

FTRA 529 Révision et correction en traduction (A) (3 crédits)

ou

FTRA 530 Révision et correction en traduction (F) (3 crédits)

- **Cours en option** (15 crédits)

  15 crédits choisis parmi les cours suivants :

  FRAA 523 Rédaction II (3 crédits)
  FTRA 513 Traduction scientifique et technique du français à l'anglais (3 crédits)
  FTRA 514 Traduction scientifique et technique de l'anglais au français (3 crédits)
  FTRA 515 Traduction commerciale et juridique du français à l'anglais (3 crédits)
  FTRA 516 Traduction commerciale et juridique de l'anglais au français(3 crédits)
  FTRA 517 Stage de formation du français à l'anglais I (A) (3 crédits)
  FTRA 519 Stage de formation du français à l'anglais II (A) (3 crédits)
  FTRA 520 Stage de formation (F) (6 crédits)
  FTRA 521 Stage de formation (A) (6 crédits)
  FTRA 522 Stage de formation de l'anglais au français I (F) (3 crédits)
  FTRA 526 Stage de formation de l'anglais au français II (F) (3 crédits)
  FTRA 527 Travaux dirigés (A) (3 crédits)
  FTRA 528 Travaux dirigés (F) (3 crédits)
  FTRA 534 Terminologie et mondialisation (3 crédits)
  FTRA 542 Traduction avancée en sciences humaines et sociales (F) (3 crédits)
  FTRA 543 Advanced Translation in Social Sciences and the Humanities (A) (3 crédits)
  FTRA 544 Traduction littéraire avancée (F) (3 crédits)
  FTRA 545 Advanced Literary Translation (A) (3 crédits)
  FTRA 547 Traduction économique du français à l'anglais(A) (3 crédits)
  FTRA 548 Traduction économique de l'anglais au français (F) (3 crédits)
  FTRA 552 Traduction automatique (TA) et traduction assistée par ordinateur (TAO) (3 crédits)
  FTRA 555 Gestion de projets (3 crédits)
  FTRA 558 Pratique de la localisation (3 crédits)
  FRAA 598 Étude avancée d'un sujet particulier (3 crédits)
  FTRA 598 Étude avancée d'un sujet particulier (3 crédits)

Liste des cours

FRAA 523 Rédaction II (3 crédits)
Ce cours vise l'approfondissement des compétences rédactionnelles par l'apprentissage de techniques de recherche documentaire et de synthese textuelle, et par l'écriture de textes combinant ces techniques comme le compte rendu critique, le dossier ou le texte de vulgarisation.
N.B. : Les étudiantes et étudiants qui ont suivi FRAN 503 ne peuvent obtenir de crédits pour ce cours.

FTRA 500 Méthodologie générale de la recherche en traduction (3 crédits)
Co-listé : FTRA 600.
Ce séminaire examine les principales méthodes et approches appliquées à l'étude de la traduction et héritées des sciences humaines et sociales. Ce tour d'horizon débouche sur des questions liées à la conceptualisation en traductologie : quelle est la place de l'historicité dans la théorisation du savoir sur la traduction ? La traductologie doit-elle s'autonomiser et construire une méthodologie spécifique par rapport aux autres sciences humaines ? À quelles conditions cette construction est-elle possible ? À l'issue du séminaire, l'étudiante ou l'étudiant aura une vue d'ensemble de la théorisation en traduction, ce qui lui permettra de se spécialiser en connaissance de cause dans une problématique particulière cohérente avec les visées du programme.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 600 ne peuvent obtenir de crédits pour ce cours.

FTRA 501 Traduction littéraire du français à l'anglais (3 crédits)
Sensibilisation aux problèmes spécifiques à la traduction littéraire. Travaux pratiques : traduction de textes de genres variés (A).

FTRA 504 Traduction littéraire de l'anglais au français (3 crédits)
Sensibilisation aux problèmes spécifiques à la traduction littéraire. Travaux pratiques : traduction de textes de genres variés (F).

FTRA 513 Traduction scientifique et technique du français à l'anglais (3 crédits)
Initiation aux différents problèmes de la traduction dans les langues de spécialité scientifiques et techniques (français-anglais). Le cours est divisé en deux ou trois parties, chaque partie correspondant à un domaine spécialisé en traduction (A).

FTRA 514 Traduction scientifique et technique de l'anglais au français (3 crédits)
Initiation aux différents problèmes de la traduction dans les langues de spécialité scientifiques et techniques (anglais-français). Le cours est divisé en deux ou trois parties, chaque partie correspondant à un domaine spécialisé en traduction (F).

FTRA 515 Traduction commerciale et juridique du français à l'anglais (3 crédits)
Initiation aux différents problèmes de la traduction dans les langues de spécialité de l'administration, du

commerce et du droit (français-anglais). Le cours est divisé en parties, chaque partie correspondant à un domaine spécialisé en traduction (A).

FTRA 516 Traduction commerciale et juridique de l'anglais au français (3 crédits)
Initiation aux différents problèmes de la traduction dans les langues de spécialité de l'administration, du commerce et du droit (anglais-français). Le cours est divisé en parties, chaque partie correspondant à un domaine spécialisé (F).

FTRA 517 Stage de formation du français à l'anglais I (A) (3 crédits)
FTRA 519 Stage de formation du français à l'anglais II (A) (3 crédits)
FTRA 520 Stage de formation (F) (6 crédits)
FTRA 521 Stage de formation (A) (6 crédits)
FTRA 522 Stage de formation de l'anglais au français I (F) (3 crédits)
FTRA 526 Stage de formation de l'anglais au français II (F) (3 crédits)
FTRA 527 Travaux dirigés (A) (3 crédits)
FTRA 528 Travaux dirigés (F) (3 crédits)

FTRA 529 Révision et correction en traduction (A) (3 crédits)
Ce cours aborde les différentes méthodes de révision et de correction de textes rédigés ou traduits en anglais; il sensibilise les étudiantes et étudiants aux aspects humains et techniques du métier de réviseure et de réviseur; on touche aussi aux problèmes de l'évaluation de la qualité des traductions (A).

FTRA 530 Révision et correction en traduction (F) (3 crédits)
Ce cours aborde les différentes méthodes de révision et de correction de textes rédigés ou traduits en français; il sensibilise les étudiantes et étudiants aux aspects humains et techniques du métier de réviseure et de réviseur; on touche aussi aux problèmes de l'évaluation de la qualité des traductions (F).

FTRA 532 Initiation à la traduction générale (3 crédits)
Ce cours vise à initier les étudiantes et étudiants aux outils notionnels et linguistiques nécessaires pour traduire efficacement des textes d'ordre général. Il leur présente aussi les étapes du processus de la traduction et les familiarise avec les outils de travail de la traduction.

FTRA 533 Aspects théoriques et pratiques de la terminologie (3 crédits)
Principes généraux de la terminologie; distinction entre langue générale et langues de spécialité; rapport entre documentation et terminologie; analyse terminologique; terminologie de traduction; supports terminographiques traditionnels et/ou informatisés; terminologie et aménagement linguistique.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 531 ne peuvent obtenir de crédits pour ce cours.

FTRA 534 Terminologie et mondialisation (3 crédits)
Préalable : FTRA 533 ou l'équivalent.
Ce cours porte sur certains points fins en terminologie et en terminographie modernes : synonymie, marques sociolinguistiques, néonymie, normalisation et internationalisation. Il traite spécifiquement du rôle de la terminologie dans la gestion de l'information unilingue et multilingue dans les entreprises et dans les organismes nationaux et internationaux. L'aspect pratique prend, entre autres, la forme de rédaction de rapports de recherche et l'utilisation d'outils terminotiques.

FTRA 536 Informatique et traduction (3 crédits)
Ce cours porte sur la langue de l'informatique, la théorie et les concepts fondamentaux qui s'y rapportent. Il comporte des exercices de traduction et une initiation aux outils informatisés pour les traducteurs : Internet, bases de données, systèmes de traduction assistée,utilitaires. (F/A)

FTRA 539 Courants contemporains en traductologie (3 crédits)
Co-listé : FTRA 601.
Ce séminaire est axé sur les approches théoriques récentes, par exemple la théorie féministe, le déconstructionnisme, l'anthropologie culturelle appliquées à la théorisation de la traduction. Ces approches, chacune à leur échelle, mettent en discussion diverses notions traditionnelles - l'ethnicité, l'identité, la culture nationale - et conduisent à redéfinir ce qui est tenu, au XXI^{e} siècle, comme l'un des fondements spécifiques de la traduction, le transfert culturel. Ainsi, ce séminaire engagera l'étudiante et l'étudiant à reconceptualiser la traduction dans des cadres contemporains définis, par exemple celui du post-colonialisme ou celui de la circulation accélérée des flux d'information par les moyens techniques modernes, notamment informatiques.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 601 ne peuvent obtenir de crédits pour ce cours.

FTRA 540 Lecture critique de traductions (3 crédits)
Co-listé : FTRA 610.
Ce séminaire propose une étude critique des traductions de l'anglais au français et du français à l'anglais effectuée à travers l'histoire, en tenant compte de la diversité des visées esthétiques et des contraintes institutionnelles de la traduction. L'accent est mis sur l'étude des « grandes » traductions dans les cultures d'expression anglaise et française.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 610 ne peuvent obtenir de crédits pour ce cours.

FTRA 542 Traduction avancée en sciences humaines et sociales (F) (3 crédits)
FTRA 543 Advanced Translation in Social Sciences and the Humanities (A) (3 crédits)
Co-listé : FTRA 612 ou FTRA 613.
Ce séminaire pratique et théorique aborde plusieurs domaines des sciences humaines et sociales, notamment la sociologie, la psychanalyse, la théorie féministe. L'étudiante ou l'étudiant produit un commentaire analytique sur ses choix de traduction en s'efforçant de théoriser sa pratique de traducteur-traductrice. Le

séminaire FTRA 542 a l'anglais comme langue de départ et le français comme langue d'arrivée (F); le séminaire FTRA 543 a le français comme langue de départ et l'anglais comme langue d'arrivée (A).
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 612 ou FTRA 613 ne peuvent obtenir de crédits pour ce cours.

FTRA 544 Traduction littéraire avancée (F) (3 crédits)
FTRA 545 Advanced Literary Translation (A) (3 crédits)
Co-listé : FTRA 614 ou FTRA 615.
Ce séminaire pratique et théorique analyse, à partir de théories littéraires, contemporaines, un échantillon de textes à traduire. L'étudiante ou l'étudiant produit un commentaire analytique sur ses choix de traduction en s'efforçant de théoriser sa pratique de traducteur-traductrice. Le séminaire FTRA 544 a l'anglais comme langue de départ e t le français comme langue d'arrivée (F); le séminaire FTRA 545 a le français comme langue de départ et l'anglais comme langue d'arrivée. (A)
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 614 ou FTRA 615 ne peuvent obtenir de crédits pour ce cours.

FTRA 547 Traduction économique du français à l'anglais (A) (3 crédits)
Sensibilisation aux problèmes que pose dans le domaine de l'économie la traduction du français à l'anglais. (A)

FTRA 548 Traduction économique de l'anglais au français (F) (3 crédits)
Sensibilisation aux problèmes que pose dans le domaine de l'économie la traduction de l'anglais au français. (F)

FTRA 549 Sociologie de la traduction littéraire (3 crédits)
Co-listé : FTRA 619.
Ce séminaire applique la méthode sociologique à la traduction des genres et des discours de la littérature. Peuvent être étudiés des corpus divers (roman, poésie, théâtre, par exemple) traduits de l'anglais en français et du français en anglais. Seront examinées, par exemple, les théories de Pierre Bourdieu, de Niklas Luhmann ou de Bruno Latour. Le séminaire est l'occasion d'une remise en question des notions de source et de cible en traduction.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 541, FTRA 611 ou FTRA 619 ne peuvent obtenir de crédits pour ce cours.

FTRA 552 Traduction automatique (TA) et traduction assistée par ordinateur (TAO) (3 crédits)
Préalable : FTRA 536 pour le diplôme en traduction.
Ce cours permet d'analyser les aspects morphologiques, lexicaux, syntaxiques et sémantiques des systèmes de traduction automatisée. L'étudiante et l'étudiant apprennent à appliquer les concepts analysés à un système commercialisé. Ils évaluent des traductions machine, font des exercices simples de programmation

portant sur des problèmes linguistiques; ils appliquent des outils de gestion et de traduction au matériel à localiser à l'aide de logiciels de localisation, de logiciels de terminologie et de mémoires de traduction.

FTRA 555 Gestion de projets (3 crédits)
Ce cours traite de la gestion des projets de traduction/localisation multilingues, depuis la création de l'offre de services, jusqu'au contrôle de la qualité et de la livraison, en passant par la résolution de problèmes et la gestion en situation de crise. Il comprend une partie théorique et des mises en situation. Les étudiantes et étudiants se familiarisent avec l'évaluation des ressources (humaines et matérielles) nécessaires pour exécuter le travail, l'élaboration d'échéanciers et le suivi du budget. Ils apprennent à gérer les ressources affectées aux projets afin de pouvoir respecter le mandat qui leur est confié.

FTRA 558 Pratique de la localisation (3 crédits)
L'étudiante et l'étudiant apprennent dans ce cours les stratégies de localisation et les processus de localisation; la localisation de logiciels et de localisation de sites Web; les acteurs dans les projets de localisation; la situation et le travail du traducteur dans les projets de localisation; les types de fichiers à localiser : ressources, code source, fichiers d'aide, guides imprimés, matériel marketing; les types de logiciels localisés : logiciels système, logiciels de gestion, logiciels client, logiciels multimédia, logiciels Web.

FRAA 598 Étude avancée d'un sujet particulier (3 crédits)
N.B. : Les étudiantes et étudiants qui ont suivi un sujet particulier en FRAN 598 ne peuvent obtenir de crédits pour le même sujet en FRAA 598.

FTRA 598 Étude avancée d'un sujet particulier (3 crédits)

Certificat anglais-français en langue et techniques de localisation

Conditions générales d'admission

BA en traduction, spécialisation ou majeure ; DESS en traduction ; MA en traductologie ; BA dans une autre discipline avec expérience en traduction ; MA dans une autre discipline avec expérience en traduction. La sélection des candidatures est effectuée sur la base des éléments suivants :

- Étude du dossier
- Examen d'entrée
- Lettre de présentation

Durée des études

Les 15 crédits au programme peuvent être effectués à temps plein (trois sessions) ou à temps partiel (douze sessions maximum).

Exigences du programme

Toute étudiante ou tout étudiant doit obtenir 15 crédits. Toute note inférieure à *C* constitue un échec. Obtenir deux *C* constitue également un échec. Le comité d'études supérieures du département revoit le dossier de chaque étudiante et de chaque étudiant tous les ans et peut exiger que ceux et celles dont les résultats ne satisfont pas aux normes du département (moyenne générale de 2,7 sur 4,3) se retirent du programme.

Cours obligatoires (12 crédits)

FTRA 552 Traduction automatique (TA) et traduction assistée par ordinateur (TAO) (3 crédits)
FTRA 555 Gestion de projets (3 crédits)
FTRA 556 Programmation en localisation (3 crédits)
FTRA 558 Pratique de la localisation (3 crédits)

Cours en option (3 crédits)

FRAA 532 Écriture pour le Web (3 crédits)
FTRA 551 Tutorat en localisation (3 crédits)
FTRA 553 Contextes socio-politiques de la traduction (3 crédits)

Liste des cours

FRAA 532 Écriture pour le Web (3 crédits)
Préalable : Autorisation de la direction du certificat.
Ce cours vise à familiariser l'étudiante ou l'étudiant aux techniques d'écriture pour le Web et aux technologies associées à ce média. Il permettra de mieux comprendre ce que l'hypertexte et l'écrit sur support numérique impliquent du point de vue du traitement de l'information et des spécificités linguistiques et ergonomiques. Il vise à initier l'étudiante et l'étudiant à la création et à la traduction de pages et de sites Web.

FTRA 551 Tutorat en localisation (3 crédits)
Préalable : Autorisation de la direction du certificat.

FTRA 552 Traduction automatique (TA) et traduction assistée par ordinateur (TAO) (3 crédits)
Préalable : FTRA 536 pour le diplôme en traduction.
Ce cours permet d'analyser les aspects morphologiques, lexicaux, syntaxiques et sémantiques des systèmes

de traduction automatisée. L'étudiante et l'étudiant apprennent à appliquer les concepts analysés à un système commercialisé. Ils évaluent des traductions machines, font des exercices simples de programmation portant sur des problèmes linguistiques; ils appliquent des outils de gestion et de traduction au matériel à localiser à l'aide de logiciels de localisation, de logiciels de terminologie et de mémoires de traduction.

FTRA 553 Contextes socio-politiques de la traduction (3 crédits)
Co-listé : FTRA 603.
Ce séminaire examine les théories qui rendent compte du travail pratique du traducteur et de la réception de la traduction du point de vue socio-politique. Sont examinés, par exemple, les effets de la localisation en traduction, les cas de bilinguisme et de multiculturalisme dans le monde, le statut juridique des langues dominantes et minoritaires, l'évolution des politiques linguistiques et leurs répercussions sur la traduction, la concurrence des langues internationales et les marchés nouveaux de la traduction.
N.B. : Les étudiantes et étudiants qui ont suivi FTRA 550 ou FTRA 603 ne peuvent obtenir de crédits pour ce cours.

FTRA 555 Gestion de projets (3 crédits)
Ce cours traite de la gestion des projets de traduction/localisation multilingues, depuis la création de l'offre de services, jusqu'au contrôle de la qualité et de la livraison, en passant par la résolution de problèmes et la gestion en situation de crise. Il comprend une partie théorique et des mises en situation. Les étudiantes et étudiants se familiarisent avec l'évaluation des ressources (humaines et matérielles) nécessaires pour exécuter le travail, l'élaboration d'échéanciers et le suivi du budget. Ils apprennent à gérer les ressources affectées aux projets afin de pouvoir respecter le mandat qui leur est confié.

FTRA 556 Programmation en localisation (3 crédits)
Préalable : FTRA 552 ou FTRA 558.
L'étudiante et l'étudiant se familiarisent dans ce cours avec l'environnement informatique : ils se familiarisent avec l'intégration et le partage des ressources d'un (et avec un) logiciel (d'une page Internet) et avec les restrictions liées au système d'exploitation; ils ont un aperçu du fonctionnement d'un logiciel (rédaction, compilation, exécution), d'un programme informatique : variables, données, contrôle; d'un langage de programmation : structure, manipulation des chaînes d'entrée et de sortie, du code « source » d'un programme informatique (ou site Internet) à localiser, des chaînes (des messages) à traduire.

FTRA 558 Pratique de la localisation (3 crédits)
L'étudiante et l'étudiant apprennent dans ce cours les stratégies de localisation et les processus de localisation : la localisation de logiciels et la localisation de sites Web; les acteurs dans les projets de localisation; la situation et le travail du traducteur dans les projets de localisation; les types de fichiers à localiser : ressources, code source, fichiers d'aide, guides imprimés, matériel marketing; les types de logiciels localisés : logiciels système, logiciels de gestion, logiciels clients, logiciels multimédia, logiciels Web.

Exercise Science

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Exercise Science Website

Master of/Magisteriate in Science (Exercise Science)

Admission Requirements. The admission requirement is a BSc or equivalent degree in Exercise Science or related field of study. Applicants are selected on the basis of past academic record, letters of recommendation, relevance of proposed research to the expertise of the department, and TOEFL scores (minimum TOEFL iBT, 100; TOEFL PBT, 600). Enrolment in the Master's program is limited in part by the availability of research supervisors.

If a core deficiency exists in the student's previous undergraduate background, otherwise qualified candidates may be required to take up to 12 undergraduate credits.

There are no prerequisite certification requirements for Clinical Exercise Physiology. Students applying for the Athletic Therapy option should have or be preparing to acquire CATA certification. While not required, CATA certification is an asset for acceptance into the program.

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (three terms) of full-time study, or the equivalent in part-time study.
- **Courses.** Students must complete four 3-credit courses (EXCI 610, 612, 624, 626).
- **Thesis.** (EXCI 680 or EXCI 690 - 33 credits). Students must select either the Athletic Therapy (EXCI 680) or Clinical Exercise Physiology (EXCI 690) Thesis track. Students must present their thesis proposal before their thesis advisory committee, and the proposal must be approved by the committee before research activity is initiated. An oral examination will be conducted before a committee of the department to test the student's ability to defend the thesis. A formal presentation of the thesis to the students' peers is also required.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 6 credits. Students with a GPA that falls below 3.00 after 6 credits are considered on academic probation during the following review period. Students with a GPA below 3.00 after two consecutive review periods will be withdrawn from the program.
- **Progress Report.** Each student's progress is formally evaluated by the student's thesis supervisor every six months and a report submitted to the Graduate Program Director.
- **C Rule.** Students who obtain less than a grade of *B-* in a course are required to repeat the course. Students receiving more than one *C* grade will be withdrawn from the program.
- **F Rule.** Students who receive a failing grade during their MSc program will be withdrawn from the program.
- **Time Limit.** Students are encouraged to complete the program within 2 years. Those who do not complete the MSc program within two years must submit a formal request for an extension to the Graduate Program Director before they can maintain their registration in the program. Students who exceed a two-year time period may not be guaranteed funding. Part-time students may apply to the program based on the availability of faculty supervisors. It is recommended that part-time students complete the degree within 5 years.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

For the MSc program, every student must complete the following courses

EXCI 610 – Statistics and Research Design (3 credits)
EXCI 612 – Laboratory Techniques (3 credits)
EXCI 624 – Special Topics Seminar (3 credits)
EXCI 626 – Thesis Proposal (3 credits)
EXCI 680 – Thesis (Athletic Therapy) (33 credits)
OR
EXCI 690 – Thesis (Clinical Exercise Physiology) (33 credits)

Master of/Magisteriate in Science (Exercise Science) (45 credits)

Year I
Fall (6 credits) EXCI 610^{3}, 624^{3}
Winter (6 credits) EXCI 612^{3}, 626^{3}
Year II
33 credits EXCI 680^{33} or EXCI 690^{33}

EXCI 610 Statistics and Research Design (3 credits)
This course provides students with a background in statistics and experimental design. Students are exposed to a variety of experimental designs applicable to the exercise sciences. The course covers the application of statistical concepts in consideration of specific experimental design methods. A number of parametric and non-parametric statistics are introduced for hypothesis testing, with the opportunity to apply relevant knowledge using various statistical software packages.

EXCI 612 Laboratory Techniques (3 credits)
The course provides a theoretical awareness of measurement principles and offers practical experience in applying techniques common to advanced research methodologies in exercise science. The potential topics to be covered are geared towards the requirements of the individual in the areas of exercise physiology and athletic therapy. These may include such topics as data acquisition and analysis, electromyography, blood flow methodologies, spectrophotometry, pulmonary gas exchange, motion analysis, and tissue histochemistry.

EXCI 624 Special Topics Seminar (3 credits)
This course is designed to meet the special needs of graduate students in the exercise science areas of concentration specific to athletic therapy and clinical exercise physiology. Topics vary within the domain to account for investigation of current and developing theories. The course involves presentation, discussion, and critical analysis of information from current scientific journal literature.

EXCI 626 Thesis Proposal (3 credits)
This course provides students with the opportunity to choose a research topic and formulate a research proposal under the supervision of a thesis advisor. The proposal should include a literature review, rationale, hypothesis, and methodology including the planned research design and data analysis. Students are required to present a seminar in the Department on their research prior to the presentation of their proposal to the thesis advisory committee.

EXCI 680 Thesis (Athletic Therapy) (33 credits)
Students are required to demonstrate their ability to carry out independent research which reflects a scientific approach. The thesis will be examined by the students advisory committee before being accepted by the Department. In addition, an oral examination will be conducted before a committee of the department to test the students ability to defend the thesis.

EXCI 690 Thesis (Clinical Exercise Physiology) (33 credits)
Students are required to demonstrate their ability to carry out independent research which reflects a scientific approach. The thesis will be examined by the students advisory committee before being accepted by the Department. In addition, an oral examination will be conducted before a committee of the department to test the students ability to defend the thesis.

EXCI 698 Selected Topics in Exercise Science (3 credits)
This course explores themes within the area of Exercise Science.

Geography, Planning and Environment

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Geography Website

Master of/Magisteriate in Science (Geography, Urban and Environmental Studies)
Master of/Magisteriate in Environment (Environmental Assessment)
Diploma in Environmental Assessment

Master of/Magisteriate in Science (Geography, Urban and Environmental Studies)

Admission Requirements. The normal requirements for admission into the MSc (Geography, Urban and Environmental Studies) are a minimum GPA of 3.30 in a BA or BSc in Geography, Planning, or Environmental Science, or an equivalent degree in a related field of study from a recognized university. Applicants are selected on the basis of a sound undergraduate academic record, strong letters of recommendation, and a convincing statement of purpose which clearly describes their academic interest in the program and intended area of research. In addition, admission is contingent on the availability of an appropriate faculty member in the Department to serve as supervisor. Some applicants with deficiencies in their undergraduate preparation may be required to take a qualifying program. Others may be required to complete certain prerequisite courses in addition to the regular graduate program.

Proficiency in English. Any student applying from outside Canada whose first language is other than English must demonstrate proficiency in the English language by writing the Test of English as a Foreign Language (TOEFL) and obtaining a minimum score of 95 on the TOEFL iBT or 587 on TOEFL PBT.

Requirements for the Degree

- **Residence.** The minimum residence requirement is one year (three semesters) of full-time graduate study, or the equivalent in part-time study.
- **Courses.** All students must take the following:
  9 credits: HENV 605, HENV 615, HENV 685.
  6 credits in elective courses chosen from: GEOG 620, GEOG 625, HENV 635, HENV 640, HENV 645, HENV 655, HENV 665, or HENV 675.
- **Thesis.** HENV 695 (30 credits)

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students in research master's/magisteriate programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Required Courses

HENV 605 Research Concepts and Design (3 credits)
The research seminar examines concepts relevant to human interventions in the environment, where 'environment' broadly encompasses the natural or bio-physical environment, the urban, built, or designed environment, and the human, cultural or behavioural environment. Students will benefit from the interdisciplinary nature of the program by learning more about research design issues and ethical notions in different fields and contexts. The course also allows students to develop their own research methodologies among a peer group of students.

HENV 615 Research Group Seminar (3 credits)
This seminar provides an opportunity to extend, deepen, and apply the conceptual and methodological frameworks presented in the core and elective courses. Students are required to participate in one of the proposed research groups, comprised of faculty members and other graduate students who share a particular thematic or methodological focus (e.g. GIS, sustainable communities, environmental change, sustainable transportation). Each research - group - is administered by a faculty member and supported by graduate students who will serve as co-coordinators to the research group.

HENV 685 Thesis Proposal (3 credits)
Students are required to select their research topic and formulate a research proposal under the supervision of a thesis supervisor and with input from a thesis committee. The written proposal will include a sound

rationale for the proposed research, a detailed description of the research design and methodology, and a comprehensive literature review. Students are also required to present an oral presentation of their proposal to the Department. The thesis proposal must be formally approved by the thesis committee and the Graduate Program Director before research activities can begin. The thesis proposal should be completed before the end of the second semester of residency in the Program and after a minimum of 6 credits in the Program have been taken.

HENV 695 Thesis (30 credits)
Students are required to demonstrate their ability to carry out original, independent research. The thesis, which will be researched and written under the direction of a supervisor and thesis committee, should normally not exceed 100 pages. Upon completion of the thesis, the student will be required to defend his/her thesis before an external examiner and his/her thesis committee.

Elective Courses

GEOG 620 Special Topics in Geography (3 credits)
This course focuses on selected topics within the discipline. Topics vary to permit investigation of current and developing theories and research areas.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. GEOG 620A, GEOG 620B, etc.

GEOG 625 Directed Studies (3 credits)
With written permission of the graduate program director, a student studies a particular field or topic relating to geography, urban or environment studies. A detailed outline of the proposed study, approved by a study supervisor is required.

HENV 635 Spatial Analysis (3 credits)
This course examines analytical methods for handling specifically spatial data, where the arrangement of observations in space is thought to be of significance. The emphasis is on the choice and application of appropriate methods for the analysis of various types of data that are encountered in Geography, Planning and Environmental Studies. Procedures for analyzing spatial distributions of phenomena, temporal dynamics and change are examined in relation to Geographical Information Systems (GIS) tools and statistical techniques.

HENV 640 (Re)shaping the City (3 credits)
By relying on an array of theoretical formulations informed by political economy, economic geography, urban morphology, urban sociology, anthropology and ecology, this seminar explores various social processes that contribute to the shaping and reshaping of our cities' material and spatial forms.

HENV 645 Behaviour and the Urban Environment (3 credits)
This course provides a basic understanding of the relationship between people and the urban environment. The focus is on the collective and individual responses of people to the built or designed environment, and the way in which these responses can be used to guide projects, plans and policies. The basic studies for the location of commercial facilities and the modeling of human spatial behaviour are introduced.

HENV 655 Environmental Modelling (3 credits)
The different approaches to modelling the bio-physical, built or human environment are examined. The conceptualization of simple models to examine how human interventions affect the environment is investigated. Different modeling approaches such as system models, computer visualization and simulation are covered. Students develop a model scheme related to their thesis topic. Lectures and laboratory.

HENV 665 Special Topics Seminar (3 credits)
This course is designed to meet the special needs of individual graduate students. Topics vary to permit investigation of current and developing theories and research areas. Content involves presentation, discussion, and critical analysis of information from relevant scientific literature. The course will also take advantage of visiting expertise.

HENV 675 Community-Based Conservation (3 credits)
This course addresses the question of community participation in conservation and development initiatives. Focusing on the particular experience of local communities, it presents participatory concepts, principles, tools, and processes that have practical application to a broad range of contexts and settings.
Note: Students who have received credit for GEOG 607 may not take this course for credit.

Master of/Magisteriate in Environment (Environmental Assessment)

Admissions Requirements. The normal requirement for admission to the MEnv in EA is a Bachelor's degree in an appropriate discipline in Arts or Science from a recognized university with a minimum GPA of 3.30 on 4.30. Applicants are selected on the basis of a sound undergraduate academic record and strong language skills in English and/or French which will allow them to secure an internship, which is a requirement of the program. Students who lack appropriate Ecology or Geographic Information Systems preparation are required to take preparatory courses such as BIOL 208, Environmental Biology; GEOG 374, Plant Ecology; or GEOG 363, Geographic Information Systems. Those lacking a social science background may be required to take GEOG 355, Resource Analysis and Management, or a similar course.

Students already registered in the Diploma in EA (DEA) are permitted to apply to the MEnv in EA. Students who choose to apply to the MEnv in EA will not graduate from the DEA, but their courses and grades will be transferred to the MEnv in EA. A minimum grade of *B* is required for a course to be transferred from the DEA

to the MEnv in EA. The Graduate Committee of the Department is responsible for the admissions transfer from the DEA to the MEnv in EA.

Proficiency in English. Any student applying from outside Canada whose first language is other than English must demonstrate proficiency in the English language by writing the Test of English as a Foreign Language (TOEFL) and obtaining a minimum score of 95 on the TOEFL iBT or 587 on TOEFL PBT.

Requirements for the Degree

- **Residence.** The minimum period of residence is two terms of full-time study or the equivalent in part-time study.
- **Courses.** All students must take the following:
    - **Compulsory Courses.** All students must take 18 credits: ENVS 601, ENVS 662, ENVS 663.
    - **Courses in Governance and Environmental Sustainability.** All students must take 6 credits from: ECON 659, ENVS 603, ENVS 605, ENVS 620, GEOG 607, HENV 675, POLI 605.
    - **Courses in the Biogeophysical Environment.** All students must take 6 credits from: BIOL 618, ENVS 606, GEOG 620, GEOG 670, GEOG 674, HENV 655.

      Note: Elective courses within list B and C may be substituted with permission of the department based on individual student background and need.

- **Internship.** ENVS 695 (15 credits)
  To enter the internship students must have completed the prescribed 30 credits of course work, must have achieved an an overall GPA of 3.30 or higher, and must have demonstrated language proficiency as required by the internship host. Students who are ineligible to enter the internship, but have successfully completed all course work, may transfer to the Diploma in Environmental Assessment.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students are allowed to receive no more than one *C* grade in order to remain in good standing in the university.

- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for readmission. Students who receive another failing grade after re-admission will be withdrawn from the program.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Required Courses

ENVS 601 EA: Concepts, Principles and Practice (6 credits)
Prerequisite: Permission of the EA Graduate Program Director.
This course aims to provide students with theoretical and practical knowledge related to environmental assessment and its role in project planning and policy development. The evolution of environmental assessment (EA), its current practices and functions including ethical consideration, as well as future directions are discussed. The roles and components of EA and EA procedures in Quebec and the rest of Canada (at both the federal and provincial levels) will be emphasized. Guest speakers, regular readings and in-class discussions will supplement the lectures.
Note: Students who have received credit for ENVS 501 may not take this course for credit.

ENVS 662 Data Collection and Analysis for EA (6 credits)
Prerequisite: Permission of the EA Graduate Program Director.
This course focuses on methods and issues in data collection and analysis appropriate for impact prediction in the abiotic, biotic and built environment, including air, surface and ground water, soil, landscape, biodiversity, noise, cultural and socio-economic conditions. Students will conduct their own studies and present them in the form of EA reports.
Note: Students who have received credit for ENVS 562 may not take this course for credit.

ENVS 663 Geographical Information Systems for EA (6 credits)
Prerequisite: Permission of the EA Graduate Program Director.
This course examines the use of Geographical Information Systems (GIS) in Environmental Impact Assessment (EA), particularly focusing on the role of GIS in the analysis of environmental data and in decision-making processes. Topics covered include data acquisition (e.g. digitizing, integrating data from different sources), multi-criteria decision analysis, fuzzy sets, interpolation techniques and error analysis. The instruction is built around a series of practical exercises mainly using industry-standard GIS software. The differences between raster and vector approaches are stressed throughout the course. The objective of the course is to provide a sound theoretical and practical background in the use of GIS for EA applications.

Note: Students who have received credit for ENVS 563 or for this topic under an ENVS 598 number may not take this course for credit.

ENVS 695 Internship in EA (15 credits)
Prerequisite: Completion of all course work (30 credits) and permission of the EA Graduate Program Director.
This internship is a 4-month placement in either the public or private sector where EA work is being undertaken. It is intended to maximize the educational experience and bridge the gap between what employers consider necessary job skills and what the university considers essential for a practitioner. Students work with their faculty supervisor to prepare a written research paper which is presented in an oral examination. It should be an original work which adds to the theory, concepts or methods of environmental assessment.
Note: Students are assisted in their efforts to obtain a relevant placement by the Internship Coordinator and all placements must be approved by the EA Graduate Program Director.

Diploma in Environmental Assessment

Admissions Requirements. A Bachelor's degree in an appropriate discipline in Arts or Science is required. Students who lack appropriate Ecology or Geographic Information Systems preparation are required to take preparatory courses such as BIOL 208, Environmental Biology; GEOG 374, Plant Ecology; or GEOG 363, Geographic Information Systems.

Proficiency in English. Any student applying from outside Canada whose first language is other than English must demonstrate proficiency in the English language by writing the Test of English as a Foreign Language (TOEFL) and obtaining a minimum score of 95 on the TOEFL iBT or 587 on TOEFL PBT.

Requirements for the Diploma

- **Residence.** The minimum period of residence is two terms of full-time study or the equivalent in part-time study.
- **Credits.** A fully qualified candidate is required to complete a minimum of 30 credits as follows:
    - **Compulsory Courses.** All students must take 18 credits: ENVS 601, ENVS 662, ENVS 663.
    - **Courses in Governance and Environmental Sustainability.** All students must take 6 credits from: ECON 659, ENVS 603, ENVS 605, ENVS 620, GEOG 607, HENV 675, POLI 605.
    - **Courses in the Biogeophysical Environment.** All students must take 6 credits from: BIOL 618, ENVS 606, GEOG 620, GEOG 670, GEOG 674, HENV 655.

      Note: Elective courses within list B and C may be substituted with permission of the department based on individual student background and need.

Required Courses

ENVS 601 EA: Concepts, Principles and Practice (6 credits)
Prerequisite: Permission of the EA Graduate Program Director.
This course aims to provide students with theoretical and practical knowledge related to environmental assessment and its role in project planning and policy development. The evolution of environmental impact assessment (EA), its current practices and functions, and future directions will be discussed. The roles and components of EA and EA procedures in Canada (at both the federal and provincial levels) will be emphasized. Guest speakers, regular readings and in-class discussions will supplement the lectures.
Note: Students who have received credit for ENVS 501 may not take this course for credit.

ENVS 662 Data Collection and Analysis for EA (6 credits)
Prerequisite: Permission of the EA Graduate Program Director.
This course focuses on methods and issues in data collection and analysis appropriate for impact prediction in the abiotic, biotic and built environment, including air, surface and ground water, soil, landscape, biodiversity, noise, cultural and socio-economic conditions. Students will conduct their own studies and present them in the form of EA reports.
Note: Students who have received credit for ENVS 562 may not take this course for credit.

ENVS 663 Geographical Information Systems for EA (6 credits)
Prerequisite: Permission of the EA Graduate Program Director.
This course examines the use of Geographical Information Systems (GIS) in Environmental Assessment (EA), particularly focusing on the role of GIS in the analysis of environmental data and in decision-making processes. Topics covered include data acquisition (e.g. digitizing, integrating data from different sources), multi-criteria decision analysis, fuzzy sets, interpolation techniques and error analysis. The instruction is built around a series of practical exercises mainly using industry-standard GIS software. The differences between raster and vector approaches are stressed throughout the course. The objective of the course is to provide a sound theoretical and practical background in the use of GIS for EA applications.
Note: Students who have received credit for ENVS 563 or for this topic under an ENVS 598 number may not take this course for credit.

Elective Courses Open to MEnv and DEA Students

BIOL 618 Ecology for Environmentalists (3 credits)
Prerequisite: Permission of the EA Graduate Program Director.
This course discusses the principles of the ecology of individuals, populations, communities and ecosystems and the effects of environmental disturbances ranging from immediate pollution to long-term climate change.

Note 1: Students who have received credit for BIOL 508 may not take this course for credit.
Note 2: Students registered in a graduate program in Biology may not take this course for credit.

ECON 659 Economics for Environmentalists (3 credits)
Prerequisite: Permission of the EA Graduate Program Director.
This course considers one of the most serious problems facing our global civilization: the on-going conflict between economic activity and the bio-physical world upon which all human activity ultimately depends. The course explains the basic theoretical framework most economists use to describe economic activities and the relationship between these activities and the natural world. Understanding the logical apparatus of economics theory shows why market forces and environmental integrity are often in conflict and why economic arguments dominate environmental policy debates at both national and international levels.
Note 1: Students who have received credit for ECON 559 may not take this course for credit.
Note 2: Students registered in programs in Economics, or programs in the John Molson School of Business, may not take this course for credit.

ENVS 603 Water Resource Management (3 credits)
This course examines the complexity of, and necessity for, improved water resource management from the viewpoint of ecological and economic sustainability as well as social equity and basic human health and dignity. Topics include: the qualities, values and uses of water-consumptive and non-consumptive, economic and environmental; major regional and global water management issues; factors affecting water supply reliability and challenges to maintain and improve long-term quality and equitable service in different situations; and the ways domestic, industrial and agricultural water users can conserve water.
Note: Students who have received credit for this topic under an ENVS 503 number may not take this course for credit.

ENVS 605 Environmental Standards (3 credits)
Prerequisite: Permission of the EA Graduate Program Director.
This course provides an overview of the International Standards Organization (ISO) standards and guidelines for industry to implement a sound Environmental Management System (EMS). These guidelines are outlined in a series of publications designated as ISO 14000. Topics covered will include: the evolution and benefits of EMS, the ISO 14001 principles, integration between ISO 9001 and 14001, the registration process, auditing an EMS, life cycle assessment, and environmental labelling. Upon successful completion of the course, students are encouraged to pursue formal accreditation.
Note: Students who have received credit for this topic under an ENVS 505 number may not take this course for credit.

ENVS 606 Seminar in Environmental Earth Science (3 credits)
An understanding of the biogeophysical environment is crucial for informed policy decisions. Current issues in environmental earth science are examined, including earth system interactions, feedback loops, climate

change, the carbon cycle, energy and air quality stratospheric ozone, water resources, and life on earth. Public policy as it pertains to these issues is discussed.
Note: Students who have received credit for this topic under an ENVS 506 number may not take this course for credit.

ENVS 620 Advanced Topics in Environmental Assessment (3 credits)
This course focuses on selected topics within the discipline. Topics vary to permit investigation of current and developing theories and research areas.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. ENVS 620A, ENVS 620B, etc.

GEOG 607 Indigenous Resource Management (3 credits)
This course examines the relationship between indigenous peoples and their environment. It focuses on two primary themes; first, it looks at ways in which ecological knowledge shapes indigenous resource management, land tenure, and sea-rights systems; and second, it examines the roles of indigenous peoples and state authorities in land, sea and resource management.
Note: Students who have received credit for HENV 675 may not take this course for credit.

GEOG 620 Special Topics in Geography (3 credits)
This course focuses on selected topics within the discipline. Topics vary to permit investigation of current and developing theories and research areas.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. GEOG 620A, GEOG 620B, etc.

GEOG 670 Environmental Management (3 credits)
The focus of this course is on recent rethinking of environmental management approaches, including complex adaptive systems, socio-ecological systems, and resilience. Case studies of emerging adaptive management approaches are examined.
Note: Students who have received credit for this topic under a GEOG 570 number may not take this course for credit.

GEOG 674 Forest Management (3 credits)
This course looks at the changes in the exploitation and management of the forest resource in Canada. Topics include the history of cutting strategies and their effect on species composition; the effects of technological changes in harvesting, transportation and milling on forests; and the evolution of modern forest management philosophies and approaches.

Note: Students who have received credit for this topic under a GEOG 574 number may not take this course for credit.

HENV 655 Environmental Modelling (3 credits)
The different approaches to modelling the bio-physical, built or human environment are examined. The conceptualization of simple models to examine how human interventions affect the environment is investigated. Different modeling approaches such as system models, computer visualization and simulation are covered. Students develop a model scheme related to their thesis topic. Lectures and laboratory.

HENV 675 Community-Based Conservation (3 credits)
This course addresses the question of community participation in conservation and development initiatives. Focusing on the particular experience of local communities, it presents participatory concepts, principles, tools, and processes that have practical application to a broad range of contexts and settings.
Note: Students who have received credit for GEOG 607 may not take this course for credit.

POLI 605 Environmental Law (3 credits)
Prerequisite: Permission of the Political Science Graduate Program Director.
This course introduces students to environmental law from the viewpoint of the scientific, political and economic issues underlying environmental conflicts pertaining to air and water pollution, toxic substances, solid waste, and hazardous waste disposal. The course provides an overview of issues such as statutory, regulatory and case analysis, liability, natural resource damages, settlement strategies, due diligence and cleanup standards and technologies. Canadian public policy and the role of government as policy-maker/regulator are discussed with comparative legislation, policy and management on the US and international fronts.

History

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History Website

Doctor of/Doctorate in Philosophy (History)
Master of/Magisteriate in Arts (History)

Doctor of/Doctorate in Philosophy (History)

Admission Requirements. The normal requirement for admission to the PhD is a Master of/Magisteriate in Arts degree in History, with high standing, from a recognized university. Applicants should understand that admission is contingent on a superior academic record, strong references, and a convincing statement of purpose which clearly describes their professional goals and intended area of research. In addition, admission is contingent on the availability of an appropriate faculty member in the History department to serve as supervisor.

Requirements for the Degree

- **Credits.** A fully-qualified candidate entering the program with a master's or magisteriate degree is required to complete a minimum of 90 credits.
- **Residence.** The minimum period of residence is 6 terms (including summer terms) of full-time graduate study beyond the master's or magisteriate degree, or 9 terms of full-time graduate study beyond the bachelor's degree for those students who are permitted to enrol for doctoral studies without a master's or magisteriate degree, or the equivalent in part-time study.
- **Courses.** (12 credits). Doctoral students are required to take 12 credits of 800-level courses, six of which must be tutorials in their major area. The additional six credits are normally chosen from the department's seminars. In exceptional cases, students may, with permission of the Graduate Program Director, do three credits of course work at an equivalent level in another discipline.
- **Comprehensive Examinations.** (12 credits). During their first year in the program, and in consultation with the GPD, new PhD students will form an advisory committee of three faculty members to assist in the selection and preparation of comprehensive fields. After students have completed the four required doctoral courses they will begin to prepare for the comprehensives under the supervision of their three field supervisors.

The major field will be that in which the student's proposed doctoral thesis falls. Normally two of the fields chosen will be from the same historical/geographical area. Although most fields are defined by the department as the history of a specific geographical region between designated dates, many thematic fields are also available. Any student may offer one examination in a related discipline when approved by the History Graduate Committee and by the appropriate faculty member and/or program administrator in that discipline.

The preparation of a comprehensive field should give students sufficient background to teach at an introductory level and/or do advanced research in the field. Although the requirements may vary from one field to the next, a core reading list of 50 to 100 titles per field is suggested as reasonable. The reading list for a field will be drawn up by the professor in consultation with the student, and once established, both must agree to any significant changes.

The examinations will normally be scheduled in the fifth term (or spring of the second year) of the student's program. The comprehensives will consist of take-home examinations in three selected fields, each to be completed over a 72 hour period. These written examinations (which will be done on a word processor) will normally be completed within a three-week period. If successful they will be followed by an oral examination, involving all three examiners, to be held within two weeks of the last written comprehensive. The purpose of the oral comprehensive is to allow the doctoral student the opportunity to explain or expand on parts of the written examinations which professors found inadequate or unclear, as well as to allow for more general discussion among the examiners and the student as a group of historians.

- **Comprehensive Fields.** Subject to the availability of appropriate faculty members, the History department is normally prepared to supervise comprehensive examinations in the following fields:

  Europe. England, 500-1485; Britain, 1485-1837; Renaissance and Reformation; France since 1789; 20th century Germany; Russia, 1700 to present.

  Canada. Colonial and Native History; 1840 to 1896; 1896 to present; French Canada to 1867; Modern Quebec to present.

  United States. Colonial and Native History; 19th century; 20th century; U.S. foreign relations.

  Africa since 1800. Selected topics.

  Asia since 1750. China; India; Japan; Middle East; selected topics in Southeast Asia.

  Latin America since 1500. Selected topics.

Caribbean. 17th to 19th centuries.

Comparative or Thematic History. Students may develop, in consultation with their major advisor and with the approval of the History Graduate Committee, comparative or thematic fields for their comprehensive examinations. These fields shall be limited to the historical areas where the departmental resources are available. Some examples include: Gender and Women's History; Genocide and Human Rights; Urban History; and International Relations.

- **PhD Thesis Proposal and Colloquium.** HIST 885: PhD Thesis Proposal and Colloquium (6 credits). Following the successful completion of the comprehensive exams, students will prepare a written thesis proposal for the approval of the internal members of their thesis committee. The thesis proposal should describe and justify the intended topic, explain its place in the historiography of the field, discuss the intended research methods, and identify the source requirements including their availability. When the written proposal is approved the student will present an oral colloquium about the proposal to the Department. When the proposal and colloquium requirements have been satisfied the student will be admitted to candidacy.
- **Thesis.** HIST 890: Thesis Research (60 credits). Doctoral students must submit a thesis based on their research and defend it in an oral examination. A doctoral thesis in history is expected to be based on extensive research in primary sources, to make an original contribution to historical knowledge, and to be presented in an acceptable literary form. The PhD thesis should normally run to no more than 400 pages including all critical apparatuses.
- **Language.** Doctoral candidates are required to demonstrate their ability to read and translate historical material in one modern language other than English. In addition, students may elect, or may be required, to demonstrate competence in a second language. Language examinations, which are normally given twice a year, are administered by the department. Dictionaries are not allowed in writing the exam.
- **Time Limits.** All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of initial registration in the program.

Master of/Magisteriate in Arts (History)

Admission Requirements. The normal requirement for admission into the MA is an honors degree in history or its equivalent. Applicants should understand that admission is contingent on a sound undergraduate academic record, strong letters of reference, and a convincing statement of purpose which clearly describes their academic interest in the program and intended area of research. In addition, admission is contingent on the availability of an appropriate faculty member in the History department to serve as supervisor. Some applicants with deficiencies in their undergraduate preparation may be admitted into a Qualifying Year program.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits. The allocations of credits for Options A and B are specified below.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Language.** All MA students must demonstrate their ability to read and translate historical material in an acceptable language other than English. Language examinations, which are normally given twice a year, are administered by the department.
- **Time Limits.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).

Master of/Magisteriate in Arts with an Original Essay (Option A)

- **Courses.** (18 credits). All students in Option A are required to complete 18 credits of courses at the 600 level, including HIST 600: Historical Theories and Methods (3 credits) and HIST 605: Introduction to the Original Essay (3 credits). Students are normally encouraged to incorporate breadth in their course selection. In exceptional cases students may, with the permission of the GPD, do 3 credits of course work at an equivalent level in another discipline.
- **Original Research Essay.** (27 credits). All students in Option A must write an Original Research Essay, HIST 680. Under faculty supervision, students write an essay of approximately 40 pages in length that is based on primary research.

Master of/Magisteriate in Arts with a Thesis (Option B)

- **Courses.** (12 credits). All students in Option B must take 12 credits of 600 level courses including HIST 600: Historical Theories and Methods (3 credits). Students are normally encouraged to incorporate breadth in their course selection. In exceptional cases students may, with permission of the GPD, do 3 credits of course work at an equivalent level in another discipline.
- **Thesis.** HIST 685: MA Thesis (33 credits). The thesis is a work of primary research that normally runs to no more than 100 pages. Prepared under the supervision of one or more faculty it must be defended orally before a committee of three History faculty including the supervisor.

Courses

All graduate courses are one-term courses. Courses numbered 600 are taken at the master's level and valued at 3 credits. Courses numbered 800 are taken at the PhD level and valued at 3 credits. Additional work is

required of doctoral students. The content of these courses varies from term to term. Students should consult the department for more detailed information.

HIST 600 Historical Theories and Methods (3 credits)
This course examines the history of the discipline and the nature of historical knowledge, as well as contemporary debates about the meaning and practice of history. The content varies from term to term depending on the instructor(s). The material covered may include the following: research tools (e.g. library resources, the archives and the Internet), major approaches to history (e.g. Marxist, Annaliste, feminist), the debate about objectivity and truth in history, public history (history in film, television, schools, museums), and the impact of postmodernism on historical practice.

HIST 605 Introduction to the Original Research Essay (3 credits)
This course is required for all MA students in Option A and will be given as a tutorial by the faculty member who will supervise the Original Research Essay. The purpose of the course is to review the secondary literature that is relevant to the student's proposed area of research and to develop a formal research proposal.

European History

HIST 610/810 Selected Topics in European History (3 credits)
HIST 819 Tutorial in European History (3 credits)

Students in these courses may be required to have a reading knowledge of a language other than English as specified by the instructor(s).

Canadian History

HIST 620/820 Selected Topics in Canadian History (3 credits)
HIST 829 Tutorial in Canadian History (3 credits)

Students in these courses may be required to have a reading knowledge of both French and English.

United States History

HIST 630/830 Selected Topics in US History (3 credits)
HIST 839 Tutorial in US History (3 credits)

Non-Western History

HIST 640/840 Selected Topics in Non-Western History (3 credits)
HIST 849 Tutorial in Non-Western History (3 credits)

Genocide History

HIST 650/850 Selected Topics in the History of Genocide (3 credits)
HIST 859 Tutorial in Genocide History (3 credits)

Gender History

HIST 660/860 Selected Topics in the History of Gender (3 credits)
HIST 869 Tutorial in Gender History (3 credits)

Selected Areas of History

HIST 670/870 Selected Topics in History (3 credits)
HIST 679/879 Tutorial in a Selected Area of History (3 credits)

Research, Theses, and Comprehensive Examinations

HIST 680 MA Original Research Essay (27 credits)
HIST 685 MA Thesis (33 credits)
HIST 880 Comprehensive Examinations (12 credits)
HIST 885 PhD Thesis Proposal and Colloquium (6 credits)
HIST 890 Thesis Research (60 credits)

Humanities

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Humanities Website

Doctor of/Doctorate in Philosophy (Humanities)

Admission Requirements. The normal requirement is a master's degree with high standing from a recognized university. The Humanities Program Committee will scrutinize the applicant's academic background and proposed program of study in order to determine whether a) the applicant's interests are truly interdisciplinary, and fall within the scope of the available faculty and facilities at Concordia, and b) the student's record indicates that he or she is likely to be able to cope with a demanding program involving rigorous practice in more than one discipline.

Requirements for the Degree

- **Fields of Study.** Students in the Humanities Program are expected to pursue a pattern of independent interdisciplinary study under the direction and supervision of scholars in three fields, one of which shall be chosen as the student's major field. (A "field" is defined as a recognizable and coherent segment of a discipline, e.g., Victorian literature as a field within the discipline of English literature, German history 1870-1945 as a field within the discipline of History, or Sociology of knowledge as a field within the discipline of Sociology. In some cases a "field" may be itself interdisciplinary or non-disciplinary as, for example, hermeneutics or meta-science). The Humanities Program Committee will assess and approve students' proposed fields of study to ensure that a) the candidate's overall program is sufficiently intensive and interdisciplinary, b) competent faculty are available to direct it, and c) the student's special interests are recognized.
- **Advisory Committee.** Prior to admission into the program, students form an advisory committee composed of three faculty members: the major field supervisor and the two minor field advisors. In consultation with the student, the advisory determines the student's program of study.
- **Credits.** A fully-qualified candidate is required to complete a minimum of 90 credits. These are apportioned as follows: minimum course requirements, 24 credits; three comprehensive field examinations, each examination worth 3 credits; thesis proposal (with defence), 3 credits; thesis, 54 credits.

- **Residence.** The minimum residence requirement is two years (6 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** Candidates are required to take two 3-credit mandatory core seminars in their first year: Humanities 888 (Methodology) and Humanities 889 (Thematic). The remaining course credits (18 minimum) normally consist of a combination of 3-credit directed study tutorials, regularly scheduled graduate courses offered by departments in areas relevant to the student's program of study, and may include HUMA 887 (Special Topic). The selection of courses is reviewed for approval by the student's advisory committee, taking into consideration the needs of the student's program of study and availability of faculty resources. The directed study tutorials provides students with the opportunity to pursue advanced and focused work with individual faculty members in the three fields that constitute the student's program of study. Directed study tutorials are designated with a Humanities 800 number: Directed Studies (3 credits) within the sequence HUMA 830 to 884.
- **Cognate Courses.** A candidate may be required to enrol in existing graduate courses offered in other programs in addition to those formally required for the PhD Humanities degree, if, in the opinion of the student's advisory committee, the chosen field of study demands it.
- **Comprehensive Examinations (Humanities 885).** Before admission to candidacy for the degree, students must pass three comprehensive field examinations and an oral examination of the student's written thesis proposal. The three comprehensive field examinations are normally written during the term immediately following the completion of the 24 (minimum) course credits. The examinations are set and coordinated by the student's advisory committee. The three comprehensive field examinations are designated:

  HUMA 885A Comprehensive Examination Major Field (3 credits)
  HUMA 885B Comprehensive Examination Minor Field I (3 credits)
  HUMA 885C Comprehensive Examination Minor Field II (3 credits)

- **Thesis Proposal (Humanities 886).** Students are admitted to candidacy for the PhD upon acceptance by their advisory committee of the written thesis proposal and its successful oral defence. The oral examination of the written thesis proposal normally takes place in the term following the writing of the comprehensive field examinations.
- **Thesis (Humanities 890).** A doctoral thesis should be based on extensive research in primary sources, make an original contribution to knowledge, and be presented in acceptable scholarly form. Students entering the program with MFA degrees may include studio work as a component of their program of study and thesis project, with the approval of the Humanities Program Director and the student's advisory committee.
- **Language Requirement.** Doctoral candidates are required to demonstrate an ability to read and translate scholarly material in at least one language (other than the candidate's first language) relevant to their studies.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on an annual basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students who obtain a grade of *C* in a course are required to repeat the course or take another course. Students receiving more than one *C* grade will be withdrawn from the program.
- **F Rule.** Students who receive a failing grade in the course of their PhD Studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a doctoral degree must be completed before or during the calendar year, 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Required Courses

HUMA 888 Seminar in Interdisciplinary Studies I (3 credits)
A required core seminar to be taken by all students in their first year in the program. This course is an introduction to methodologies of interdisciplinary study germane to the Humanities, Fine Arts and Social Sciences. The course also sensitizes students to historical changes in the way intellectual inquiry is conceptualized and carried out.

HUMA 889 Seminar in Interdisciplinary Studies II (3 credits)
A required core seminar to be taken by all students in their first year in the program. Each year a different topic is selected with the aim of exploring how a theme of common interest (e.g., space/time, publics and counterpublics, performance) is pursued and challenged across disciplinary boundaries.

Elective Course

HUMA 887 Advanced Seminar in Special Topics in Interdisciplinary Studies (3 credits)
This seminar examines in-depth special topics in interdisciplinary studies.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. HUMA 887A, HUMA 887B, etc.

Comprehensive Examinations and Thesis

HUMA 885A Comprehensive Examination Major Field (3 credits)
HUMA 885B Comprehensive Examination Minor Field I (3 credits)
HUMA 885C Comprehensive Examination Minor Field II (3 credits)
HUMA 886 Thesis Proposal with Defence (3 credits)
HUMA 890 Thesis (54 credits)

Journalism

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Journalism Website

Master of/Magisteriate in Arts (Journalism Studies)
Diploma in Journalism

Master of/Magisteriate in Arts (Journalism Studies)

Admission Requirements. The normal requirement for admission into the MA is an undergraduate degree with a minimum GPA of 3.00 on a 4.30 scale. A journalism degree and experience in journalism or a media-related field is considered a strong asset. Applicants should understand that admission is contingent on a sound undergraduate academic record, strong letters of reference, and a convincing statement of purpose which clearly describes their academic interest in the program and intended area of research. In addition, admission is contingent on the availability of an appropriate faculty member in the Journalism Department to serve as supervisor. Applicants who lack certain prerequisite courses may be required to take a qualifying program of up to 12 undergraduate credits in addition to the regular graduate program. For the qualifying program a minimum grade point average of 3.00 (*B* average) is required.

Proficiency in English. Applicants whose first language is other than English must demonstrate proficiency in the English language by writing the Test of English as a Foreign Language (TOEFL iBT) and scoring a minimum of 90 with a minimum of 20 on the written test.

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to complete a minimum of 45 credits. The requirements are 18 credits of coursework, 6 credits of readings and thesis proposal, and 21 credits of thesis research.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Courses.**

  Core and Elective Courses
  Students are required to complete 18 credits of course work. The following core courses are

required:
JOUR 601 Foundations of Journalistic Thought I (3 credits)
JOUR 602 Foundations of Journalistic Thought II (3 credits)
JOUR 603 Political Economy of Journalism (3 credits)
JOUR 604 Research Methods in Journalism Studies (3 credits)

Six credits of elective courses may be chosen from this list:
JOUR 610 International Journalism (3 credits)
JOUR 620 Journalism Ethics (3 credits)
JOUR 630 Mediating Diversity (3 credits)
JOUR 640 Textual Approaches to Journalism (3 credits)

Further Requirements
JOUR 650 Journalism Readings and Proposal (6 credits)
JOUR 690 Thesis (21 credits)

Academic Regulations

GPA Requirement. The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, a student must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

C Rule. Students in master's/magisteriate programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.

F Rule. Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program.

Time Limit. All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for a part-time student the time limit is 15 terms (5 years).

Graduation Requirement. In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

JOUR 601 Foundations of Journalistic Thought I (3 credits)
This course provides a critical introduction to foundational ideas about journalism and its role in society from an historical perspective, treating journalism as a social and cultural practice. It addresses the scope and purpose of journalism and journalism scholarship and traces several threads of journalism's historical, philosophical, ideological, and legal roots in Europe and the Americas.

JOUR 602 Foundations of Journalistic Thought II (3 credits)
Prerequisite: JOUR 601.
This course examines the intellectual and institutional structures of contemporary journalism, paying particular attention to current theoretical approaches, such as media, communication, political, and feminist theory.

JOUR 603 Political Economy of Journalism (3 credits)
This course considers journalism through its organization as a cultural industry and critically evaluates journalism's economic structures and the impact those structures have on journalism practice. Topics may include media economics, free-market theory, media ownership, the role of the government and the role of organized labour.

JOUR 604 Research Methods (3 credits)
This course examines a variety of research methods commonly used in the study of journalism, from both qualitative and quantitative perspectives. Students will better understand the relationship between research methodologies in solving a particular intellectual (research) problem. Through readings, the course exposes students to a series of linked research skills with a goal of helping students develop their own research practice.

JOUR 610 International Journalism (3 credits)
Prerequisite: JOUR 601 previously or concurrently.
This course examines journalism as a cross-cultural and global practice, addressing such issues as media representation, multiculturalism, globalization and international news flows.

JOUR 620 Journalism Ethics (3 credits)
Prerequisite: JOUR 601 previously or concurrently.
This course explores the foundations of journalism ethics and how they have evolved theoretically, historically, and pragmatically in the newsroom. The course explores the many dimensions and assumptions informing what it means to be honest, fair, and courageous in gathering, interpreting and reporting information.

JOUR 630 Mediating Diversity (3 credits)
Prerequisite: JOUR 601 previously or concurrently.

The coverage of diversity issues is a critical aspect of both contemporary and historical journalism studies. Through primary source examples, case studies, and readings, this course examines journalism's mediating function in society, paying particular attention to news media representation of minorities and marginalized groups.

JOUR 640 Textual Approaches to Journalism (3 credits)
Prerequisite: JOUR 601 previously or concurrently.
This course concentrates on journalism's use of all forms of language, from written text to sounds and images. Drawing from the literature on linguistics, semiotics, textual and discourse analysis, students consider ways in which journalists, through their use of language to describe and depict people, events, institutions and ideas, become implicated in the news they report.

JOUR 650 Journalism Readings and Proposal (6 credits)
Prerequisite: JOUR 602.
In consultation with the faculty advisor, the student reviews relevant literature pertinent to the research topic and writes a thesis proposal demonstrating knowledge based upon the review of the scholarly literature.

JOUR 690 Thesis (21 credits)
Prerequisite: JOUR 650.
The thesis is researched and written under the direction of a supervisor. Upon completion, it is submitted to the student's Thesis Committee. The thesis is defended in an oral examination before the Thesis Committee.

Diploma in Journalism

Admission Requirements. Entry into the program requires a bachelor's degree or equivalent in a field other than journalism from a recognized university with a minimum GPA of 3.00. However, students who have graduated with a Journalism degree in a language other than English may also be considered. Applicants are required to submit a letter of intent together with the application which should be about 600 words outlining the student's background, academic and work experience, and aspirations in journalism. Qualified applicants may be interviewed. Students should be aware that written assignments in workshops are in English.

Although it will not determine acceptance, applicants are advised that a working knowledge of French is important. Normally the program will be taken full-time and completed in one year (3 terms).

Requirements for the Diploma

- **Credits.** A fully-qualified candidate is required to complete a minimum of 33 credits.
- **Courses.** All students are required to complete 33 credits in the following sequence:

Summer Term (9 credits)
JOUR 502 Introduction to the Print Process
JOUR 511 Introduction to Broadcasting
JOUR 519 Computer Assisted Reporting

Fall Term (12 credits)
JOUR 500 Perspectives on Contemporary Media
JOUR 504 News Reporting and Writing
JOUR 530 Advanced Radio News
JOUR 536 Advanced Television Workshop

Winter Term (12 credits)
JOUR 509 Copy Editing and Layout
JOUR 513 Journalism Ethics and the Law

And two of the following courses:
JOUR 505 Advanced Print Workshop
JOUR 508 Research Project
JOUR 520 Directed Study
JOUR 528 On-line Magazine
JOUR 532 Public Affairs Workshop in Broadcast Journalism
JOUR 533 Workshop in Business Communications
JOUR 542 Seminar in International Journalism
JOUR 566 Photojournalism

Academic Regulations

- **GPA Requirement.** Students having completed at least four courses are assessed at the end of the Fall term based on creditable courses completed in the program. To be permitted to continue, students must have obtained a cumulative grade point average of at least 2.70.
- **C Rule.** A student receiving a grade of *C* in two courses will be required to withdraw from the program.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a diploma program must be completed within 6 terms (2 years) from the time of initial registration in the program for full-time students; for part-time students the time limit is 12 terms (4 years).

- **Graduation Requirement.** To graduate, students must have completed all course requirements with a cumulative grade point average of at least 2.70.

Courses

JOUR 500 Perspectives on Contemporary Media (3 credits)
The course will examine the complex structures of modern media and how they have evolved. It will focus on media theory and the organization, practices and problems of media enterprises, and their impact on audiences and on society. The effects of technology, ownership and regulation will be discussed within the framework of an examination of public access and media accountability.

JOUR 502 Introduction to the Print Process (3 credits)
This is a comprehensive lecture/laboratory course which lays the foundations for the writing and reporting demands of journalism. Students are introduced to the salient features of print formats, and receive assignments in information-gathering and writing both in class and in the field.

JOUR 504 News Reporting and Writing (3 credits)
Prerequisite: JOUR 502.
This course is intended to consolidate the writing skills learned during the summer. Through lectures and laboratory work, students learn a variety of information-gathering and writing techniques, including short deadline news reporting and feature writing.

JOUR 505 Advanced Print Workshop (3 credits)
This workshop offers students the opportunity to perfect their skills in a variety of print formats, ranging from beat reporting to magazine writing.

JOUR 508 Research Project (3 credits)
The project is to be a comprehensive study and report on some area of modern media practice, or on the interaction of media and society. The subject and method must be approved in advance by the instructor of the course.

JOUR 509 Copy Editing and Layout (3 credits)
Prerequisite: JOUR 504.
This course offers lectures and workshops in the art of copy editing, as well as an introduction to computerized layout and newspaper production.

JOUR 511 Introduction to Broadcasting (3 credits)
This course is an introduction to the production of radio and television news programs and public affairs documentaries. Students learn writing techniques, interviewing style and production processes.

JOUR 513 Journalism Ethics and the Law (3 credits)
The course examines the journalist's responsibility in terms of both ethics and the law. It introduces students to a representative cross-section of ethical theories and codes and takes an intensive look at the most common legal issues affecting the practice of journalism.

JOUR 519 Computer-Assisted Reporting (3 credit)
Students learn the basics of desktop publishing and computer-assisted reporting, working with a variety of software and data storage systems to research, analyze and publish their work. The goal is to equip students with the skills necessary to be successful journalists in the information age.
Note: Students who have received credit for this topic under a JOUR 525 number may not take this course for credit.

JOUR 520 Directed Study (3 credits)
A student may be allowed to undertake a study of a particular field or topic relating to journalism or the news media, with written permission of the diploma program director. A detailed outline of the proposed study, and approval of a satisfactory study supervisor, is required.

JOUR 525 Special Topics in Journalism (3 credits)
When offered, content will depend on the theme designated by the program.

JOUR 526 Special Topics in Journalism (3 credits)
Students who have received credit for JOUR 525 may register for JOUR 526, provided content is different.

JOUR 528 On-Line Magazine (3 credits)
This course introduces students to the theory and practice of on-line publication and broadcast methods.
Note: Students who have received credit for this topic under a JOUR 525 number may not take this course for credit.

JOUR 530 Advanced Radio News (3 credits)
This is a workshop course in which students function as reporters, writers, news readers and editors in order to learn the skills necessary to produce daily newscasts.

JOUR 532 Public Affairs Workshop in Broadcast Journalism (3 credits)
This workshop allows students to perfect their skills in long format public affairs broadcasting in either radio or television. Working under the supervision of the instructor, students prepare a number of "magazine" pieces suitable for broadcast.

JOUR 533 Workshop in Business Communications (3 credits)
This course introduces students to the array of writing needed in a variety of business settings, including

technical writing, annual reports and speech writing.
Note: Students who have received credit for this topic under a JOUR 525 number may not take this course for credit.

JOUR 536 Advanced Television Workshop (3 credits)
This course gives students the opportunity to perfect their skills in writing for television and producing news and public affairs programming.

JOUR 542 International Journalism (3 credits)
This course examines the way journalism is practiced in a selected country or tradition. The focus of the course may change from year to year.

JOUR 566 Photojournalism (3 credits)
Using digital cameras and technology, students perform a variety of exercises and assignments to help them master the techniques used in planning, taking, and laying out news photographs.
Note: Students who have received credit for this topic under a JOUR 525 number may not take this course for credit.

Mathematics and Statistics

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Mathematics and Statistics Website

Doctor of/Doctorate in Philosophy (Mathematics)
Master of/Magisteriate in Science/Arts
Master of/Magisteriate in the Teaching of Mathematics

Doctor of/Doctorate in Philosophy (Mathematics)

Admission Requirements. Candidates will be selected on the basis of their past academic record, letters of recommendation and the relevance of the proposed area of research to the areas of specialization of the Department. The normal requirement for admission to the program is a MSc degree, with high standing in Mathematics or an allied discipline from a recognized university. Exceptional candidates who have successfully completed one-year's study at the Master's level may, upon approval by the Graduate Studies Committee, be exempted from the required completion of the Master's degree and admitted directly into the PhD program.

Requirements for the Degree

- **Credits.** Students must complete a program of 90 credits, consisting of the following components:
  - Comprehensive examinations (12 credits);
  - Six courses or seminars (18 credits);
  - Thesis (60 credits).
- **Academic Standing.** The 18 credits associated with seminar and course work must be completed with a grade point average of at least 3.00. The specific program of courses and seminars, chosen from the list, will be determined by the Graduate Studies Committee in consultation with the student's Advisory Committee.
- **Residence.** The minimum period of residence is two years of full-time graduate study, beyond the MA/MSc, or the equivalent in part-time study. (A minimum of one year of full-time study is normally expected).
- **Comprehensive Examination.** The comprehensive examination is composed of the following two parts:

Part A (6 credits)
This is a written examination, consisting of two parts. The first part of the Comprehensive A examination is to test the candidate's general knowledge of fundamental mathematical concepts. It will normally be completed within one year (3 terms) of the candidate's entry into the program or the equivalent of part-time study. The second part of the Comprehensive A examination tests the candidate's knowledge of topics in his or her area of specialization. The material will be chosen from the list of course descriptions given by the Graduate Studies Committee in consultation with the candidate's research supervisor and the student's Advisory Committee. Candidates are allowed at most one failure in the Part A examination.

Part B (6 credits)
The Comprehensive B examination is an oral presentation of the candidate's plan of his or her doctoral thesis in front of the student's Advisory Committee. It is normally taken within two-three years of the candidate's entry into the program (or the equivalent of part-time study) and at least one year before the expected completion of the thesis..

- **Thesis.** Concurrently with the preparation for the Part B exam, the students will be engaging in their research work towards the dissertation. After submitting the doctoral thesis, the candidate is required to pass an oral defence of the thesis. The doctoral thesis must make an original contribution to mathematical knowledge, at a level suitable for publication in a reputable professional journal in the relevant area.
- **Average Time to Completion.** Normally a student completes all requirements for the degree, except for the thesis, within two years of entering the program. The normal period for completion of the program, for a student already holding the equivalent of an MA/MSc degree, is three to four years.

Academic Regulations

- **GPA Requirement.** The 18 course and seminar credits must be completed with a grade point average of at least 3.00. The specific program of courses and seminars, chosen from the list, will be determined by the Graduate Studies Committee in consultation with the student's Advisory Committee.
- **C Rule.** Students who receive more than one *C* grade during the course of their PhD studies will be required to withdraw from the program. Students may apply for re-admission. Students who receive another *C* after re-admission will be required to withdraw from the program and will not be considered for re-admission.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.

- **Time Limit.** All work must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study, from the time of initial registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Elective Courses

Number Theory and Computational Algebra

MAST 830 Cyclotomic Fields (3 credits)
L-series, Dirichlet theorem, Gauss sums, Stickelberger theorem, class groups and class number, circular units, analytic formulae.

MAST 831 Class Field Theory (3 credits)
Local and global class field theory, ideles and adeles, reciprocity laws, existence theorem.

MAST 832 Elliptic Curves (3 credits)
Introduction to elliptic curves over finite fields, local and global fields, rational points, Mordell-Weil theorem, formal groups.

MAST 833 Selected Topics in Number Theory (3 credits)

MAST 834 Selected Topics in Computational Algebra (3 credits)

Analysis

MAST 837 Selected Topics in Analysis (3 credits)

MAST 838 Selected Topics in Pure Mathematics (3 credits)

Mathematical Physics and Differential Geometry

MAST 840 Lie Groups (3 credits)
The mathematical theory of Lie groups and introduction to their representation theory with applications to mathematical physics. Topics will include classical Lie groups, one-parameter subgroups, Lie algebras and the exponential mapping, adjoint and coadjoint representations, roots and weights, the Killing form, semi-direct products, Haar measure and decompositions such as those of Cartan and Iwasawa. The theory of unitary representations on Hilbert spaces. Physical applications of compact Lie groups (such as SU(2) and SU(3)) and non-compact groups (such as the Lorentz and Poincaré groups).

MAST 841 Partial Differential Equations (P.D.E.'s) (3 credits)
Introduction to the mathematical theory of P.D.E.'s, including applications to mathematical physics. Topics will include Sturm-Liouville systems, boundary value and eigenvalue problems, Green's functions for time-independent and time-dependent equations, Laplace and Fourier transform methods. Additional topics will be selected from the theory of elliptic equations (e.g. Laplace and Poisson equations), hyperbolic equations (e.g., the Cauchy problem for the wave equation) and parabolic equations (e.g., the Cauchy problem for the heat equation). Links will be made with the theory of differential operators and with analysis on manifolds.

MAST 851 Differential Geometric Methods in Physics (3 credits)
Manifolds, differential systems, Riemannian, Kahlerian and symplectic geometry, bundles, supermanifolds with applications to relativity, quantization, gauge field theory and Hamiltonian systems.

MAST 852 Algebro-Geometric Methods in Physics (3 credits)
Algebraic curves, Jacobi varieties, theta functions, moduli spaces of holomorphic bundles and algebraic curves, rational maps, sheaves and cohomology with applications to gauge theory, relativity and integrable systems.

MAST 853 Gauge Theory and Relativity (3 credits)
Yang-Mills theory, connections of fibre bundles, spinors, twistors, classical solutions, invariance groups, instantons, monopoles, topological invariants, Einstein equations, equations of motion, Kaluza-Klein, cosmological models, gravitational singularities.

MAST 854 Quantization Methods (3 credits)
Geometric quantization, Borel quantization, Mackey quantization, stochastic and phase space quantization, the problems of prequantization and polarization, deformation theory, dequantization.

MAST 855 Spectral Geometry (3 credits)
Schrödinger operators; min-max characterization of eigenvalues, geometry of the spectrum in parameter space, kinetic potentials, spectral approximation theory, linear combinations and smooth transformations of potentials, applications to the N-body problem.

MAST 856 Selected Topics in Mathematical Physics (3 credits)

MAST 857 Selected Topics in Differential Geometry (3 credits)

Dynamical Systems

MAST 860 Differentiable Dynamical Systems (3 credits)
The study of dynamical properties of diffeomorphisms or of one-parameter groups of diffeomorphisms (flows) defined on differentiable manifolds. Periodic points, the non-wandering set, and more general

invariant sets. Smale's horseshoe, Anosov, and Morse-Smale systems, general hyperbolic systems, the stable manifold theorem, various forms of stability, Markov partitions and symbolic dynamics.

MAST 861 Absolutely Continuous Invariant Measures (3 credits)
Review of functional analysis, Frobenius-Perron operator and its properties, existence of absolutely continuous invariant measures for piecewise expanding transformations, properties of invariant densities, compactness of invariant densities, spectral decomposition of the Frobenius-Perron operator, bounds on the number of absolutely continuous invariant measures, perturbations of absolutely continuous invariant measures.

MAST 862 Numerical Analysis of Nonlinear Problems (3 credits)
Continuation of solutions, homotopy methods, asymptotic stability, bifurcations, branch switching, limit points and higher order singularities, Hopf bifurcation, control of nonlinear phenomena, ODE with boundary and integral constraints, discretization, numerical stability and multiplicity, periodic solutions, Floquet multipliers, period doubling, tori, control of Hopf bifurcation and periodic solutions, travelling waves, rotations, bifurcation phenomena in partial differential equations, degenerate systems.

MAST 863 Bifurcation Theory of Vector Fields (3 credits)
Local and global bifurcations. Generalized Hopf bifurcation and generalized homoclinic bifurcation. Hamiltonian systems and systems close to Hamiltonian systems, local codimension two bifurcations of flows.

MAST 865 Selected Topics in Dynamical Systems (3 credits)

Statistics and Actuarial Mathematics

MAST 871 Advanced Probability Theory (3 credits)
Definition of probability spaces, review of convergence concepts, conditioning and the Markov property, introduction to stochastic processes and martingales.

MAST 872 Stochastic Processes (3 credits)
Stochastic sequences, martingales and semi-martingales, Gaussian processes, processes with independent increments, Markov processes, limit theorems for stochastic processes.

MAST 873 Advanced Statistical Inference (3 credits)
Decision functions, randomization, optimal decision rules, the form of Bayes' rule for estimation problems, admissibility and completeness, minimax, rules, invariant statistical decisions, admissible and minimax decision rules, uniformly most powerful tests, unbiased tests, locally best tests, general linear hypothesis, multiple decision problems.

MAST 874 Advanced Multivariate Inference (3 credits)
Wishart distribution, analysis of dispersion , tests of linear hypotheses, Rao's test for additional information, test for dimensionality, principal component analysis, discriminant analysis, Mahalanobis distance, cluster analysis, relations with sets of variates.

MAST 875 Advanced Sampling (3 credits)
Unequal probability sampling, multistage sampling, super population models, Bayes and empirical Bayes estimation, estimation of variance from complex surveys, non-response errors and multivariate auxiliary information.

MAST 876 Survival Analysis (3 credits)
Failure time models, inference in parametric models, proportional hazards, non-parametric inference, multivariate failure time data, competing risks.

MAST 877 Reliability Theory (3 credits)
Reliability performance measures, unrepairable systems, repairable systems, load-strength reliability models, distributions with monotone failure rates, analysis of performance effectiveness, optimal redundancy, heuristic methods in reliability.

MAST 878 Advanced Risk Theory (3 credits)
Generalizations of the classical risk model, renewal processes, Cox processes, diffusion models, ruin theory and optimal surplus control.

MAST 881 Selected Topics in Probability, Statistics and Actuarial Mathematics (3 credits)

Seminars

MAST 858 Seminar in Mathematical Physics (3 credits)
MAST 859 Seminar in Differential Geometry (3 credits)
MAST 868 Seminar in Dynamical Systems (3 credits)
MAST 889 Seminar in Probability, Statistics and Actuarial Mathematics (3 credits)
MAST 898 Seminar in Number Theory (3 credits)
MAST 899 Seminar in Computational Algebra (3 credits)

Thesis and Comprehensive Examinations

MAST 890 Comprehensive Examination A (6 credits)
MAST 891 Comprehensive Examination B (6 credits)
MAST 892 Doctoral Thesis (60 credits)

Master of/Magisteriate in Science/Arts (Mathematics)

Admission Requirements. Applicants must have a Bachelor's degree with Honours in Mathematics, or equivalent. Qualified applicants requiring prerequisite courses may be required to take up to 12 undergraduate credits in addition to and as a part of the regular graduate program. Promising candidates who lack the equivalent of an Honours degree in Mathematics may be admitted after having completed a qualifying program.

Requirements for the Degree

- **Credits.** A candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** Students may enter one of the two options below. The choice of the option, the selection of the courses and the topic of the thesis, must be approved by the Graduate Program Director.
- **Course Load.** A full-time student will take at least two courses during the first term. A part-time student will normally take one course during the first term. The course load during subsequent terms will be determined by the Graduate Program Director, in consultation with the student.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Normally a student receiving a grade of *C* in two courses will be required to withdraw from the program. Students withdrawing for this reason may petition the Graduate Studies Committee for special consideration. In cases of extenuating circumstances probationary continuation in the program will be considered.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a MA/MSc degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Science/Arts with Thesis (Option A)

Candidates are required to take six 3-credit courses, or equivalent, and MAST 700.

Master of/Magisteriate in Science/Arts without Thesis (Option B)

Candidates are required to take ten 3-credit courses, or equivalent, and MAST 701.

The Master of Science/Arts courses offered by the Department of Mathematics and Statistics fall into the following categories:

MAST 650-654 History and Methods
MAST 655-659 Topology and Geometry
MAST 660-669 Analysis
MAST 670-679 Statistics and Actuarial Mathematics
MAST 680-689 Applied Mathematics
MAST 690-699 Algebra and Logic
MAST 720-729 Statistics and Actuarial Mathematics

The course content will be reviewed each year in light of the interests of the students and faculty. In any session only those courses will be given for which there is sufficient demand.

History and Methods

MAST 651 The Contributions of Mathematics to Intellectual Life (3 credits)
This course examines several major mathematical advances over the centuries in the historical and intellectual contexts of the day and also focuses on the developments of a particular branch of mathematics over the more recent past. Examples may include recent advances in number theory and geometry leading to a proof of Fermat's Last Theorem and applications of number theory to cryptography.

MAST 654 Topics in the History of Mathematics (3 credits)
Note: The content will vary from term to term and from year to year. Students may re-register for this course provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 654A, MATH 654B, etc.

Topology and Geometry

MAST 655 Topology (3 credits)
Topological spaces. Order, product, subspace, quotient topologies. Continuous functions. Compactness and connectedness. The fundamental group and covering spaces.

MAST 656 Differential Geometry (3 credits)
Mappings, functions and vectors fields on R^n, inverse and implicit function theorem, differentiable manifolds, immersions, submanifolds, Lie groups, transformation groups, tangent and cotangent bundles, vector fields, flows, Lie derivatives, Frobenius' theorem, tensors, tensor fields, differential forms, exterior differential calculus, partitions of unity, integration on manifolds, Stokes' theorem, Poincaré lemma, introduction to symplectic geometry and Hamiltonian systems.

MAST 657 Manifolds (3 credits)

MAST 658 Lie Groups (3 credits)

Analysis

MAST 661 Topics in Analysis (3 credits)

MAST 662 Functional Analysis I (3 credits)
This course will be an introduction to the theory of Hilbert spaces and the spectral analysis of self-adjoint and normal operators on Hilbert spaces. Applications could include Stone's theorem on one parameter groups and/or reproducing kernel Hilbert spaces.

MAST 663 Introduction to Ergodic Theory (3 credits)
This course covers the following topics: measurable transformations, functional analysis review, the Birkhoff Ergodic Theorem, the Mean Ergodic Theorem, recurrence, ergodicity, mixing, examples, entrophy, invariant measures and existence of invariant measures.

MAST 664 Dynamical Systems (3 credits)
An introduction to the range of dynamical behaviour exhibited by one-dimensional dynamical systems. Recurrence, hyperbolicity, chaotic behaviour, topological conjugacy, structural stability, and bifurcation theory for one-parameter families of transformation. The study of unimodal functions on the interval such as the family $Fr(X) = rx(1-x)$, where $0 \leq r \leq 4$. For general continuous maps of the interval, the structure of the set of periodic orbits, for example, is found in the theorem of Sarkovskii.

MAST 665 Complex Analysis (3 credits)
Review of Cauchy-Riemann equations, holomorphic and meromorphic functions, Cauchy integral theorem, calculus of residues, Laurent series, elementary multiple-valued functions, periodic meromorphic functions, elliptic functions of Jacobi and Wierstrass, elliptic integrals, theta functions. Riemann surfaces, uniformization, algebraic curves, abelian integrals, the Abel map, Riemann theta functions, Abel's theorem, Jacobi varieties, Jacobi inversion problem. Applications to differential equations.

MAST 666 Differential Equations (3 credits)

MAST 667 Reading Course in Analysis (3 credits)

MAST 668 Transform Calculus (3 credits)

MAST 669 Measure Theory (3 credits)
Measure and integration, measure spaces, convergence theorems, Radon-Nikodem theorem, measure and outer measure, extension theorem, product measures, Hausdorf measure, L^p-spaces, Riesz theorem, bounded linear functionals on C(X), conditional expectations and martingales.

Statistics and Actuarial Mathematics

MAST 670 Mathematical Methods in Statistics (3 credits)
This course will discuss mathematical topics which may be used concurrently or subsequently in other statistics stream courses. The topics will come mainly from the following broad categories; 1) geometry of Euclidean space; 2) matrix theory and distribution of quadratic forms; 3) measure theory applications (Reimann-Stieltjes integrals); 4) complex variables (characteristic functions and inversion); 5) inequalities (Cauchy-Schwarz, Holder, Minkowski, etc.) and numerical techniques (Newton-Raphson algorithm, scoring method, statistical differentials); 6) some topics from probability theory.

MAST 671 Probability Theory (3 credits)
Axiomatic construction of probability; characteristic and generating functions; probabilistic models in reliability theory; laws of large numbers; infinitely divisible distributions; the asymptotic theory of extreme order statistics.

MAST 672 Statistical Inference I (3 credits)
Order statistics; estimation theory; properties of estimators; maximum likelihood method; Bayes estimation; sufficiency and completeness; interval estimation; shortest length confidence interval; Bayesian intervals; sequential estimation.

MAST 673 Statistical Inference II (3 credits)
Testing of hypotheses; Neyman-Pearson theory; optimal tests; linear hypotheses; invariance; sequential analysis.

MAST 674 Multivariate Analysis (3 credits)
An introduction to multivariate distributions will be provided; multivariate normal distribution and its properties will be investigated. Estimation and testing problems related with multivariate normal populations will be discussed with emphasis on Hotelling's generalized T^2 and Wishart distribution. Other multivariate techniques including MANOVA; canonical correlations and principal components may also be introduced.

MAST 675 Sample Surveys (3 credits)
A review of statistical techniques and simple random sampling, varying probability sampling, stratified sampling, cluster and systematic sampling-ratio and product estimators.

MAST 676 Linear Models (3 credits)
Matrix approach to development and prediction in linear models will be used. Statistical inferences on the parameters will be discussed after development of proper distribution theory. The concept of generalized inverse will be fully developed and analysis of variance models with fixed and mixed effects will be analyzed.

MAST 677 Time Series (3 credits)
Statistical analysis of time series in the time domain. Moving average and exponential smoothing methods to forecast seasonal and non-seasonal time series, construction of prediction intervals for future observations, Box-Jenkins ARIMA models and their applications to forecasting seasonal and non-seasonal time series. A substantial portion of the course will involve computer analysis of time series using computer packages (mainly MINITAB). No prior computer knowledge is required.

MAST 678 Statistical Consulting and Data Analysis (3 credits)

MAST 679 Topics in Statistics and Probability (3 credits)

MAST 720 Survival Analysis (3 credits)
Parametric and non-parametric failure time models; proportional hazards; competing risks.

MAST 721 Advanced Actuarial Mathematics (3 credits)
General risk contingencies; advanced multiple life theory; population theory; funding methods and dynamic control.

MAST 722 Advanced Pension Mathematics (3 credits)
Valuation methods, gains and losses, stochastic returns, dynamic control.

MAST 723 Portfolio Theory (3 credits)
Asset and liability management models, optimal portfolio selection, stochastic returns, special topics.

MAST 724 Risk Theory (3 credits)
General risk models; renewal processes; Cox processes; surplus control.

MAST 725 Credibility Theory (3 credits)
Classical, regression and hierarchical Bayes models, empirical credibility, robust credibility, special topics.

MAST 726 Loss Distributions (3 credits)
Heavy tailed distributions, grouped/censured data, point and interval estimation, goodness-of-fit, model selection.

MAST 727 Risk Classification (3 credits)
Cluster analysis, principal components, discriminant analysis, Mahalanobis distance, special topics.

MAST 728 Reading Course in Actuarial Mathematics (3 credits)

MAST 729 Selected Topics in Actuarial Mathematics (3 credits)

Applied Mathematics

MAST 680 Topics in Applied Mathematics (3 credits)

MAST 681 Optimization (3 credits)
Introduction to nonsmooth analysis: generalized directional derivative, generalized gradient, nonsmooth calculus; connections with convex analysis. Mathematical programming: optimality conditions; generalized multiplier approach to constraint qualifications and sensitivity analysis. Application of the theory: functions defined as pointwise maxima of a family of functions; minimizing the maximal eigenvalue of a matrix-valued function; variational analysis of an extended eigenvalue problem.

MAST 682 Matrix Analysis (3 credits)
Jordan canonical form and applications, Perron-Frobenius theory of nonnegative matrices with applications to economics and biology, generalizations to matrices which leave a cone invariant.

MAST 683 Numerical Analysis (3 credits)
This course consists of fundamental topics in numerical analysis with a bias towards analytical problems involving optimization integration, differential equations and Fourier transforms. The computer language C++ will be introduced and studied as part of this course; the use of “functional programming” and graphical techniques will be strongly encouraged. By the end of the course, students should have made a good start on the construction of a personal library of tools for exploring and solving mathematical problems numerically.

MAST 684 Quantum Mechanics (3 credits)
The aim of this course is two-fold: (i) to provide an elementary account of the theory of non-relativistic bound systems, and (ii) to give an introduction to some current research in this area, including spectral geometry.

MAST 685 Approximation Theory (3 credits)

MAST 686 Reading Course in Applied Mathematics (3 credits)

MAST 687 Control Theory (3 credits)
Linear algebraic background material, linear differential and control systems, controllability and observability, properties of the attainable set, the maximal principle and time-optimal control.

MAST 688 Stability Theory (3 credits)

MAST 689 Variational Methods (3 credits)

Algebra and Logic

MAST 691 Mathematical Logic (3 credits)

MAST 692 Advanced Algebra I (3 credits)
Field extensions, normality and separability, normal closures, the Galois correspondence, solution of equations by radicals, application of Galois theory, the fundamental theorem of algebra.

MAST 693 Algebraic Number Theory (3 credits)
Dedekind domains; ideal class groups; ramification; discriminant and different; Dirichlet unit theorem; decomposition of primes; local fields; cyclotomic fields.

MAST 694 Group Theory (3 credits)
Introduction to group theory, including the following topics: continuous and locally compact groups, subgroups and associated homogeneous spaces. Haar measures, quasi-invariant measures, group extensions and universal covering groups, unitary representations, Euclidean and Poincaré groups, square integrability of group representations with applications to image processing.

MAST 696 Advanced Algebra II (3 credits)

MAST 697 Reading Course in Algebra (3 credits)

MAST 698 Category Theory (3 credits)

MAST 699 Topics in Algebra (3 credits)

Thesis and Mathematical Literature

MAST 700 Thesis (27 credits)

MAST 701 Project (15 credits)
A student investigates a mathematical topic, prepares a report and gives a seminar presentation under the guidance of a faculty member.

Master of/Magisteriate in the Teaching of Mathematics

Admission Requirements. A Bachelor's degree with a minimum GPA of 3.00, an interest in the teaching of pre-university mathematics, as well as an adequate mathematical background including courses equivalent to: a) 6 credits in statistics-probability; b) 6 credits in advanced calculus; c) 6 credits in linear algebra and d) 3 credits in differential equations or algebraic systems. Candidates must be able to demonstrate their capacity for graduate level work in some academic field, not necessarily mathematics. Candidates will normally be interviewed to ensure their suitability for the program. Applicants with a deficiency in their academic background may be required to take up to 12 undergraduate credits in addition to or as a part of the regular graduate program. Promising candidates who lack the requirements for admission may be considered after having completed a qualifying program. Applicants without teaching experience may be admitted to the program provided they satisfy the Graduate Studies Committee of their potential for teaching or for educational research.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Courses.**
  Students may enter one of the three options below. The choice of the option, the selection of the courses and the thesis or project topic must be approved by the Graduate Program Director. Besides the courses listed in the present section, Master/Magisteriate in the Teaching of Mathematics (MTM) students may take any MAST 600 or higher level course offered in the MSc program, subject to the Graduate Program Director's approval. Students aspiring to become College mathematics teachers upon graduation will be encouraged to take at least three MSc mathematics courses.
  - *Thesis Option:* MATH 602, 647, 654 and eight additional 3-credit courses.
  - *Project Option:* MATH 602, 603 and eleven additional 3-credit courses.
  - *Course Option:* Fifteen 3-credit courses.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a yearly basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be

on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

- **C Rule.** Normally a student receiving a grade of *C* in two courses will be required to withdraw from the program. Students withdrawing for this reason may petition the Graduate Studies Committee for special consideration. In cases of extenuating circumstances probationary continuation in the program will be considered.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

MTM courses fall into six categories:

- Psychology of Mathematics Education (PME): MATH 630, 649.
- Didactics of Mathematics (DM): MATH 624.
- Information and Communication Technology (ICT): MATH 633, 634, and 639.
- Research in Mathematics Education (RME): MATH 641, 642, 645, and 646.
- Mathematics content courses (MC): MATH 601, 613, 616, 618, 621, 622, 625, 626, 627, 637, 640, and 648.
- Thesis or Extended Project (T/P): Seminar MATH 652; Reading courses MATH 602 and 647; Extended Project MATH 603, and Thesis MATH 654.

Each year the Department of Mathematics and Statistics offers a selection of the following courses. Courses are worth 3 credits unless otherwise indicated.

MATH 601 Topics in Mathematics
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 601A, MATH 601B, etc.

MATH 602 Readings in Mathematics Education I
This reading course is closely related to the project or thesis. The outcome is a section of the literature review chapter, related to the domain of research that is the focus of the project or thesis.

MATH 603 Extended Project (9 credits)
A student investigates a mathematics education topic, prepares a report, and gives a seminar presentation under the guidance of a faculty member.

MATH 613 Topics in Number Theory
Topics are chosen from the area of Number Theory.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 613A, MATH 613B, etc.

MATH 616 Linear Algebra
This course is an extension of undergraduate courses in linear algebra, covering a selection of topics in advanced linear algebra (e.g. from the theory of general vector spaces, linear and multilinear algebras, matrix theory, etc.)

MATH 618 Topics in the Application of Mathematics
Topics are chosen from the area of the Application of Mathematics.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 618A, MATH 618B, etc.

MATH 621 Geometry
The course offers an insight into Euclidean and Non-Euclidean geometries.

MATH 622 Abstract Algebra
The course looks at objects such as numbers, polynomials, matrices or transformations from an algebraic-structural point of view. The course may aim at proving such “famous impossibilities” as squaring the circle, duplicating the cube, trisecting an angle or solving a polynomial equation of degree 5 or more by radicals.

MATH 624 Topics in Mathematics Education
This course is an overview and critical analysis of theories and technologies of mathematics teaching. Applications of the theories to studying and/or developing teaching situations or tools for specific mathematical topics are examined.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 624A, MATH 624B, etc.

MATH 625 Topology
The course develops elements of the theory of topological spaces and their transformations.

MATH 626 Analysis I

The course is an extension of undergraduate courses in mathematical analysis in the real domain (Analysis I, II; Real Analysis; Measure Theory). Students may substitute this course with any of the MAST 660-669 courses in the MA/MSc program.

MATH 627 Analysis II

The course is an extension of undergraduate courses in mathematical analysis in the complex domain (Complex Analysis I, II). Students may substitute this course with any of the MAST 660-669 courses in the MA/MSc program.

MATH 630 Topics in the Psychology of Mathematics Education

This course studies epistemological, cognitive, affective, social and cultural issues involved in mathematics.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 630A, MATH 630B, etc.

MATH 633 Applications of Technology in Mathematics Curriculum Development

This course is an overview of the impact of information and communication technology on curricula, textbooks and teaching approaches.

MATH 634 Computer Software and Mathematics Instruction

This course is an overview and critical evaluation of computer software designed for use in mathematics instruction.

MATH 637 Statistics and Probability

This course discusses theoretical and applied aspects of statistics and probability. Students may substitute this course with any of the MAST 670-677 courses in the MA/MSc program.

MATH 639 Topics in Technology in Mathematics Education

This course involves the elaboration, experimentation and critical analysis of individual projects of integration of ICT in mathematics education.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 639A, MATH 639B, etc.

MATH 640 Topics in Logic

Topics are chosen from the area of Mathematical Logic.
Note: The content will vary from term to term and from year to year. Students may re-register for this

course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 640A, MATH 640B, etc.

MATH 641 Survey of Research in Mathematics Education
This course is an overview of recent results in mathematics education research.

MATH 642 Research Methods for Mathematics Education
This course is an overview of qualitative and quantitative methods in mathematics education research.

MATH 645 Topics in Mathematics Education Research
This course is an overview of research literature on a chosen topic or issue in mathematics education.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 645A, MATH 645B, etc.

MATH 646 Research Internship
Students conduct a pilot study or participate in a research project as a research assistant under the supervision of a senior researcher. The outcome is a written report of the study.

MATH 647 Readings in Mathematics Education II
The course is closely related to project or thesis writing. Its outcome is a section of the literature review chapter, focused on the student's particular research question.

MATH 648 Topics in the History of Mathematics
Topics are chosen from the area of the History of Mathematics.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. MATH 648A, MATH 648B, etc.

MATH 649 Heuristics and Problem Solving
This course examines cognitive processes, tools and strategies involved in solving mathematical problems.

MATH 652 Seminar in Mathematics Education
This course is primarily a thesis or project preparation seminar but it is open to students in the Course Option as well. The research related to students' research projects is presented and critically evaluated.

MATH 654 Thesis (15 credits)
Students are required to demonstrate their ability to carry out original, independent research. The thesis is researched and written under the direction of a supervisor and thesis committee. Upon completion of the thesis, the student is required to defend his/her thesis before the thesis committee.

Philosophy

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Philosophy Website

Master of/Magisteriate in Arts (Philosophy)

Admission Requirements. An honours degree in philosophy, or its equivalent. Qualified applicants requiring prerequisite courses may be required to take up to 12 undergraduate credits in addition to and as a part of the regular graduate program. Applicants with deficiencies in their undergraduate preparation may be required to take a qualifying program.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Options.** Students may enter one of the two options, A or B, outlined below.
- **Cross-registration.** Graduate students in philosophy at Concordia University may take for credit the equivalent of 6 credits at the Université de Montréal, McGill University, or the Université du Québec à Montréal. Courses taken elsewhere may be accepted as credit for one graduate-level course in the Department of Philosophy. Permission for such a substitution must be granted by the Graduate Program Director in the Department of Philosophy, and approval from the other university or department involved must be obtained.

Master of/Magisteriate in Arts with Research Paper (Option A)

Candidates are required to take the following:

- **Courses.** 18 course credits, with the following distribution requirement: (a) at least three credits in history of philosophy; (b) at least three credits in aesthetics, moral philosophy, or social and political philosophy; (c) at least three credits in metaphysics, epistemology or philosophy of science.
- **Research Paper.** Students write one major research paper (PHIL 693, 27 credits) on a topic to be determined in consultation with a faculty member, who serves as the supervisor. The student's proposal for the research paper is vetted by the Philosophy Graduate Studies Committee, and should

be submitted before May 1 of the first year of full-time study, or the second year in the case of part-time study. A research paper is expected to consider all of the relevant scholarship pertaining to its argument and to make an original contribution to knowledge. An oral defence of the research paper is required before an examining committee consisting of the supervisor and one other professor chosen by the Graduate Program Director in consultation with the supervisor. The Research Paper is graded Accepted or Rejected.

Master of/Magisteriate in Arts with Thesis (Option B)

Candidates are required to take the following:

- **Courses:** 18 course credits, with the following distribution requirement: (a) at least three credits in history of philosophy; (b) at least three credits in aesthetics, moral philosophy, or social and political philosophy; (c) at least three credits in metaphysics, epistemology or philosophy of science.
- **Thesis.** Students write a thesis (PHIL 696, 27 credits) on a topic to be determined in consultation with a faculty member. The thesis is written under the guidance of a member of the Department. The student's research proposal is vetted by the Philosophy Graduate Studies Committee, and should be submitted before May 1 of the first year of full-time study, or the second year in the case of part-time study. A master's thesis in philosophy is expected to make an original contribution to knowledge. An oral defence of the thesis is required before an examining committee consisting of the supervisor and two other professors chosen by the Graduate Program Director in consultation with the thesis supervisor. The thesis is graded Accepted or Rejected.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students in research master's/magisteriate programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).

- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

All courses are worth 3 credits unless otherwise noted.

A. History of Philosophy

PHIL 607 Kant
This course studies Kant and his work in its historical context, such as the *Critique of Pure Reason* or other texts of Kant.

PHIL 609 Selected Topics in the History of Philosophy
Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PHIL 609A, PHIL 609B, etc.

PHIL 612 Ancient Philosophy
This course studies the texts central to the development of ancient philosophical thought, such as works by Plato and Aristotle.
Note: Students who have received credit for PHIL 601 or PHIL 602 may not take this course for credit.

PHIL 613 Medieval Philosophy
This course analyzes and discusses texts central to the development of medieval philosophical thought, in the Arabic and Latin traditions. Works by Avicenna, Averroes, and Thomas Aquinas are studied.
Note: Students who have received credit for PHIL 604 may not take this course for credit.

PHIL 614 Modern Philosophy
This course studies central problems of 17th- and 18th-century European philosophy, from Bacon and Galileo at the beginning of the Scientific Revolution, through continental Rationalism (e.g., Descartes and Leibniz), to Hume and the legacy of British Empiricism.

PHIL 615 19th-Century Philosophy
This course studies the work of 19th-century philosophers in their historical context, such as Goethe, Schelling, Herder, and Hegel.

PHIL 616 Selected Topics in the History and Philosophy of Science
Subject matter varies from term to term and from year to year. Students may re-register for this course

provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PHIL 616A, PHIL 616B, etc.

PHIL 617 Origins of Analytic Philosophy
This course provides an analysis of some of the central philosophical works in the analytic tradition from the late 19th and early 20th centuries. Works by central figures such as Frege, Russell, Wittgenstein or Carnap are covered.
Note: Students who have received credit for PHIL 663 may not take this course for credit.

PHIL 618 Origins of Continental Philosophy
Students study the sources of contemporary continental European thought in the 19th century and early 20th century, which are traced to German Idealism and Romanticism, Marxism, and early phenomenology. Authors studied may include Kant, Fichte, Schelling, Hegel, Marx, Kierkegaard, Nietzsche, and Husserl.
Note: Students who have received credit for PHIL 662 may not take this course for credit.

B. Aesthetics, Moral Philosophy, or Social and Political Philosophy

PHIL 621 Value Theory
Students examine a topic in value theory, such as the exploration of different conceptions of well-being, the good, or of virtues.

PHIL 623 Issues in Ethical Theory
Students analyse central theories in normative ethics such as consequentialism, deontology, and contractualism; and in meta-ethnics such as realism, relativism, and moral nihilism.

PHIL 624 Moral Problems
Students investigate one or more approaches to difficult moral problems that confront us today, such as the need to find appropriate responses to war, revolution, tyranny, terrorism, global poverty, violence against women, and abortion.

PHIL 625 Aesthetics
This course examines central problems in the history of aesthetics and the philosophy of art, including the nature of beauty, the sublime, and the ontology of a work of art; or a study of a single text or author, such as Aristotle's *Poetics* or Kant's *Critique of Judgment*.

PHIL 626 Political Philosophy
This course investigates central theories in political philosophy, concerning distributive justice, the theory of just war, democracy, civil disobedience, freedom of speech, responsibilities to future generations, human rights, global justice, multiculturalism, liberalism, socialism, anarchism, or feminism.

PHIL 627 Marx
Students study central works by Karl Marx. The course may also address important interpretations of Marx's work, such as those developed by Analytic Marxists, Sartre, Althusser, Lukacs, or the Frankfurt School.

PHIL 628 Philosophy of Law
This course studies a central issue in philosophy of law, such as personality, property, rights, interpretation, responsibility, and punishment; or the jurisprudential perspective of such figures as Hart, Dworkin, Alexy, Luhmann, Weinrib, Waldron, Greenberg, Finnis, and Murphy.
Note: Students who have received credit for PHIL 675 may not take this course for credit.

PHIL 631 Theories of Justice
This course examines important philosophical contributions to debates about justice, such as distributive justice, political justice, human rights, global justice, and inter-generational justice.

PHIL 632 Environmental Philosophy
This course provides an analysis of the basic assumptions underlying one or more philosophical views of the natural world, such as ethical, aesthetic and ecofeminist theories as well as the theory of deep ecology.

PHIL 633 Selected Topics in Value Theory
Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PHIL 633A, PHIL 633B, etc.

C. Metaphysics, Epistemology or Philosophy of Science

PHIL 634 Selected Topics in Epistemology
Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PHIL 634A, PHIL 634B, etc.

PHIL 643 Selected Topics in Metaphysics
Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PHIL 643A, PHIL 643B, etc.
Note: Students who have received credit for this topic under a PHIL 640 or PHIL 642 number may not take this course for credit.

PHIL 644 Philosophy of Science
This course provides an analysis of philosophical issues raised by science, such as those concerning scientific

evidence, concepts, theories, and explanation; or the intersection with ethical and social problems.
Note: Students who have received credit for PHIL 650 or 657 may not take this course for credit.

PHIL 645 Philosophy of Mathematics
This course investigates some of the central issues and theories in the philosophy of mathematics such as logicism, intuitionism, or formalism. Other topics may include the nature of mathematical truth or the ontology and epistemology of mathematics.

PHIL 646 Philosophy of Language
Students analyse some aspects of the philosophy of language, such as the nature of meaning, the relation between language and thought, or the relation between language and the world.
Note: Students who have received credit for PHIL 651 may not take this course for credit.

PHIL 647 Philosophy of Mind
Students investigate central issues in the philosophy of mind, such as the architecture and modularity of the mind, the mind-body problem and mental causation, or the metaphysics and function of consciousness.
Note: Students who have received credit for PHIL 664 may not take this course for credit.

PHIL 648 Philosophy of Social Science
Students study methods of various social and human sciences and the differences in aims between, for instance, understanding, explaining, experiencing, and being liberated from oppression.
Note: Students who have received credit for this topic under a PHIL 655 number may not take this course for credit.

PHIL 649 Phenomenology
Drawing from classical and recent phenomenlogical philosophy, students study selected central figures such as Husserl, Heidegger, and issues such as meaning, the body, temporality, and phenomenological reduction.
Note: Students who have received credit for PHIL 668 may not take this course for credit.

PHIL 652 Selected Topics in Logic
Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PHIL 652A, PHIL 652B, etc.
Note: Students who have received credit for PHIL 611 may not take this course for credit.

PHIL 656 Selected Topics in Analytic Philosophy
Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the

course number, e.g. PHIL 656A, PHIL 656B, etc.
Note: Students who have received credit for this topic under PHIL 666 may not take this course for credit.

PHIL 658 Selected Topics in Continental Philosophy
Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PHIL 658A, PHIL 658B, etc.

PHIL 659 Selected Topics in Metaphysics, Epistemology, or Philosophy of Science
Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PHIL 659A, PHIL 659B, etc.

To be classified each year by the Graduate Program Director:

PHIL 672 Tutorial
PHIL 678 Topics in Current Research
PHIL 698 The Teaching of Philosophy

Research Paper and Thesis

PHIL 693 Research Paper (27 credits)
PHIL 696 Thesis (27 credits)

Cognate Courses

Students may enrol in certain courses in the Departments of Education, Political Science, and Religion with permission of the Philosophy Graduate Program Director and the second department involved.

Physics

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Physics Website

Doctor of/Doctorate in Philosophy (Physics)
Master of/Magisteriate in Science (Physics)

Doctor of/Doctorate in Philosophy (Physics)

Admission Requirements. The normal requirement for admission is a Master of Science degree in Physics with high standing from a recognized university. Meritorious students enrolled in the Master of Science program in Physics at this university who have completed all requirements except for the thesis may apply for permission to proceed directly to doctoral studies without submitting a master's thesis.

Requirements for the Degree

- **Credits.** A fully-qualified candidate, entering the doctoral program with a master's degree, is required to complete a minimum of 90 credits.
- **Residence.** The minimum period of residence is two years (6 terms) of full-time graduate study beyond the master's degree, or the equivalent in part-time study, or three years (9 terms) of full-time graduate study beyond the bachelor's degree for those students who are permitted to enrol for doctoral studies without completing a master's degree.
- **Courses.** The candidate is required to take the following:
  - 9 credits chosen from PHYS 602, 609, 637, 639, 649, and 679.
    Students may, with permission of their supervisor, substitute up to two courses from the following list:
    CHEM 620 Selected Topics in Organic Chemistry
    CHEM 630 Selected Topics in Physical Chemistry
    CHEM 677 Enzyme Kinetics and Mechanism
    CHEM 678 Protein Engineering and Design
    CHEM 690 Selected Topics in Instrumentation
    CHEM 692 Experimental Protein Chemistry
    MAST 689 Variational Methods
    MAST 694 Group Theory

MAST 840 Lie Groups
MAST 841 Partial Differential Equations
MAST 851 Differential Geometric Methods in Physics
MAST 854 Quantization Methods
MAST 855 Spectral Geometry
MAST 856 Selected Topics in Mathematical Physics
MAST 857 Selected Topics in Differential Geometry

- PHYS 861: Doctoral Seminar on Selected Topics I (3 credits), in which the candidates must present a pedagogical talk on a topic from physics to an advanced-level undergraduate student audience.
- PHYS 862: Doctoral Seminar on Selected Topics II (3 credits), in which the candidates must present a talk related to their thesis research to a critical audience.
- PHYS 870: Comprehensive Examination and Research Proposal (6 credits): The purpose of this course is to satisfy the department that the student is sufficiently prepared, in terms of background and ability, to pursue the research required for a PhD Each student will be required to prepare a written project in his/her field of research. The topic will be general, and not part of the thesis work. The oral examination will be based on the contents of this report. The Graduate Program Committee will appoint an examination committee in consultation with the thesis supervisor. The supervisor will be responsible for the subject chosen and will also act as a member of the examining committee for the oral presentation. The comprehensive examination must be completed within four months after the candidate's initial registration in the PhD Program. The grade for this course will be a Pass or Fail. In case of failure in the first attempt, only one more attempt will be allowed to take place.
- PHYS 890: Doctoral Research and Thesis (69 credits): A student who has passed the comprehensive examination will be admitted to candidacy for the PhD degree. The student will be allowed to continue working on a research project under the direction of a faculty member of the department only after passing the comprehensive examination. The research done will be in areas which reflect the interests of the faculty and the facilities of the department. The thesis must make a distinct and original contribution to knowledge, and be presented in acceptable literary form.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 6 credits. Students whose GPA falls below 3.00 are considered to be

on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

- **C Rule.** Students who obtain less than a grade of *B-* in a course are required to repeat the course or take another course. Students receiving more than one *C* grade will be withdrawn from the program.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a doctoral degree must be completed before or during the calendar year, 18 terms (six years) of full-time study or 24 terms (eight years) of part-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Science (Physics)

Admission Requirements. Applicants must have an honours degree, or its equivalent in Physics. Qualified applicants lacking prerequisite courses will be required to take undergraduate courses (up to 12 credits) in addition to the regular graduate program. Applicants with deficiencies in their undergraduate preparation may be required to take a one-year qualifying program before admission to the MSc program.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** The candidate is required to take the following:
    - PHYS 601 (3 credits);
    - 6 credits chosen from PHYS 602, 603, 609, 636, 637, 639, 642, 646, 648, 649, 676 and 679. Students may, with permission of their supervisor, substitute up to two courses from the following list:
      CHEM 620 Selected Topics in Organic Chemistry
      CHEM 630 Selected Topics in Physical Chemistry
      CHEM 677 Enzyme Kinetics and Mechanism
      CHEM 678 Protein Engineering and Design
      CHEM 690 Selected Topics in Instrumentation
      CHEM 692 Experimental Protein Chemistry
      MAST 689 Variational Methods
      MAST 694 Group Theory

    - PHYS 760: MSc Seminar on Selected Topics (3 credits). Students must give one seminar in the field of their research.
- PHYS 790: Master's Research and Thesis (33 credits): The thesis must represent the results of the student's original research work undertaken after admission to this program. Work previously published by the student may be used only as introductory or background subject matter. The thesis will be examined by a departmental committee. An oral examination will be conducted to test the candidate's ability to defend the thesis.
- The thesis may be based on a study of a significant problem in physics or a research project conducted as part of the student's employment. Permission to submit a thesis in the latter category will be granted in the event that:
    - the student's employer furnishes written approval for the pursuit and reporting of the project;
    - the student has research facilities which, in the opinion of the physics graduate studies committee, are adequate;
    - arrangements can be made for supervision of the project by a faculty member of the Department of Physics;
    - in all but exceptional cases, the student has direct supervision by a qualified supervisor at the site of the student's employment. The supervisor must be approved by the physics graduate studies committee. A written working agreement between the supervisor and the university will be required;
    - the proposed topic for the thesis, together with a brief statement outlining the proposed method of treatment, is approved by the physics graduate studies committee.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students in research master's/magisteriate programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).

- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

All courses are worth 3 credits each unless otherwise specified. The graduate courses offered by the Department of Physics fall into the following categories:

PHYS 600-609 Topics in Quantum and High Energy Physics
PHYS 630-639 Topics in Condensed Matter Physics
PHYS 640-649 Topics in Theoretical Physics
PHYS 670-679 Topics in Applied Physics

Topics in Quantum and High Energy Physics (600-609)

PHYS 601 Advanced Quantum Mechanics I (3 credits)
This course reviews the mathematical foundations of quantum mechanics, Heisenberg, Schroedinger, and interaction representations; time-dependent perturbation theory and the golden rule; collision theory, Born approximation, T-matrix and phase shifts; angular momentum theory: eigenvalues and eigenvectors, spherical harmonics, rotations and spin, additions theorems and their applications.
Note: Students who have received credit for PHYS 612 may not take this course for credit.

PHYS 602 Advanced Quantum Mechanics II (3 credits)
The following applications are examined: *non-relativistic theory* - systems of identical particles, second quantization, Hartree-Fock theory, as well as path integral formulation of quantum mechanics; *relativistic theory:* Dirac and Klein-Gordon equations, positron theory, propogator theory and their applications; field quantization, radiative effects, Dirac and Majorana spinors, Noether's theorem.
Note: Students who have received credit for PHYS 613 may not take this course for credit.

PHYS 603 High Energy Physics (3 credits)
This course discusses symmetries and groups; antiparticles; electrodynamics of spinless particles, the Dirac equation and its implications for the electrodynamics of spin 1/2 particles. A general discussion of loops, renormalization and running coupling constants, hadronic structure and partons, is used to introduce the principles of Quantum Chromodynamics and Electroweak Interactions. The course concludes with an exposition of gauge symmetries, the Weinberg-Salam model, and Grand Unification.
Note: Students who have received credit for PHYS 616 may not take this course for credit.

PHYS 609 Selected Topics in Quantum or High Energy Physics (3 credits)
This course reflects the research interests of the physics faculty in quantum or high energy physics and/or

those of the graduate students working with them.
Note: Students who have taken the same topic under PHYS 615, PHYS 618 or PHYS 619 may not take this course for credit.

Topics in Condensed Matter Physics (630-639)

PHYS 636 Condensed Matter Physics I (3 credits)
Review of electron levels in periodic potentials, various band-structure methods, Thomas-Fermi and Hartree-Fock theories, screening, anharmonic effects crystals, inhomogeneous semiconductors, p-n junctions, transistors. Dielectric properties of insulators, ferroelectric materials. Defects in crystals. Magnetic ordering, paramagnetism, diamagnetism, ferromagnetism, phase transitions, superconductivity.

PHYS 637 Condensed Matter Physics II (3 credits)
Dielectrics and ferroelectrics; diamagnetism and paramagnetism; ferro-magnetism and antiferromagnetism; magnetic resonance; optical phenomena in insulators; superconductivity.
Note: Students who have received credit for PHYS 633 may not take this course for credit.

PHYS 639 Selected Topics in Condensed Matter Physics (3 credits)
This course reflects the research interests of the physics faculty in condensed matter physics and/or those of the graduate students working with them.
Note: Students who have received credit for PHYS 635 may not take this course for credit.

Topics in Theoretical Physics (640-649)

PHYS 642 Statistical Physics (3 credits)
This course covers statistical concepts, probability, Gaussian probability distribution, statistical ensemble, macrostates and microstates, thermodynamic probability, statistical thermodynamics, reversible and irreversible processes, entropy, thermodynamic laws and statistical relations, partition functions, Maxwell's distribution, phase transformation, Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics, quantum statistics in the classical limit, black-body radiation, conduction electrons in metals, interacting particle system, lattice vibrations, virial coefficients, Weiss molecular field approximation.
Note: Students who have received credit for PHYS 654 may not take this course for credit.

PHYS 644 Advanced Classical Mechanics and Relativity (3 credits)
This course covers generalized coordinates, Lagrange's equations, method of Lagrange multipliers, variational formulation, Hamilton's equations of motion, canonical transformations, Hamilton-Jacobi theory, special theory of relativity, Einstein's axioms, Lorentz transformations, form invariance and tensors, four-vectors, gravity.
Note: Students who have received credit for PHYS 658 may not take this course for credit.

PHYS 646 Electrodynamics (3 credits)
This course covers the electrostatic boundary-value problem with Green's function, Maxwell's equations, energy-momentum tensor, guided waves, dielectric wave-guides, fibre optics, radiation static field, multipole radiation, velocity and acceleration field, Larmor's formula, relativistic generalization, radiating systems, linear antenna, aperture in wave guide, scattering, Thompson scattering, Bremsstrahlung, Abraham-Lorentz equation, Breit-Wigner formula, Green's function for Helmholtz's equation. Noether's theorem.

PHYS 648 Non Linear Waves (3 credits)
Linear stability analysis and limitations, modulated waves and nonlinear dispersion relations, Korteweg-de Vries, sine-Gordon, and nonlinear Schrödinger equations. Hydro-dynamic, transmission-line, mechanical, lattice, and optical solitions. Applications in optical fibres, Josephson junction arrays. Inverse scattering method, conservation laws.

PHYS 649 Selected Topics in Theoretical Physics (3 credits)
This course reflects the research interests of the Physics faculty in theoretical physics and/or those of the graduate students working with them.

Topics in Applied Physics (670 - 679)

PHYS 679 Selected Topics in Applied Physics (3 credits)
This course reflects the research interests of the Physics faculty in Applied Physics and/or those of the graduate students working with them.

Seminar, Thesis, and Comprehensive Examination

PHYS 760 MSc Seminar on Selected Topics (3 credits)
Students must give one seminar in the field of their research. In addition, full time students must participate in all seminars given in the department, and part time students must attend, during their studies, the same number of seminars that are normally given during the minimum residence requirement for full time students. The course in evaluated on a pass/fail basis. No substitution is permitted.

PHYS 790 Master's Research and Thesis (30 credits)

PHYS 861 Doctoral Seminar on Selected Topics I (3 credits)
Students must present one pedagogical seminar on a topic from physics to an advanced-level undergraduate student audience. This course is evaluated on a pass/fail basis. No substitution is permitted.

PHYS 862 Doctoral Seminar on Selected Topics II (3 credits)
Students must present one seminar in their current research area to a critical audience. In addition, students

are required to attend and participate in all departmental seminars. This course is evaluated on a pass/fail basis. No substitution is permitted.

PHYS 870 Comprehensive Examination and Research Proposal (6 credits)

PHYS 890 Doctoral Research and Thesis (69 credits)
Note: Students admitted prior to 1997-98 should register for PHYS 850 (70 credits). Students admitted after summer 1997 will register for PHYS 850 (66 credits).

Political Science

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Political Science Website

Doctor of/Doctorate in Philosophy (Political Science)
Master of/Magisteriate in Arts (Public Policy and Public Administration) (MPPPA)

Doctor of/Doctorate in Philosophy (Political Science)

Admission Requirements

Admission to the PhD in Political Science requires a Master of/Magisteriate in Arts in political science, political studies, international relations, public policy, or another relevant field from an accredited university. A superior academic record and strong references are both essential; professional work experience will be taken into consideration. Applicants are selected on the basis of past academic record, letters of recommendation, statement of purpose, writing sample, and the relevance of their proposed research to the research expertise in the department. Enrolment in the PhD in Political Science is limited in part by the availability of research supervisors.

Proficiency in English. Any student applying from outside Canada whose first language is other than English must demonstrate proficiency in the English language by writing the Test of English as a Foreign Language administered by the Educational Testing Service. Information and applications to write the test may be obtained by writing to: Test of English as a Foreign Language, Educational Testing Service, Princeton, New Jersey, 08540, U.S.A.

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to complete a minimum of 90 credits. In order to fulfill the requirements of the program, students will select two areas of specialization. The requirements are 21 credits of course work, 12 credits in the form of two comprehensive exams, 3 credits of thesis proposal, and 54 credits of thesis.
- **Residence Requirements.** The minimum period of residence is two calendar years (6 terms) of full-time graduate study beyond the Master's degree or the equivalent in part-time study.

- **Courses** (21 credits). All candidates must take seven 3-credit courses as described below:

  All students will select two areas of specialization (for example Canadian Politics and International Politics). Course work is divided into core courses and elective courses. Each student will take:
  - 2 core courses, one in each of the two chosen areas of specialization (POLI 801-805 Advanced Seminars);
  - 2 elective courses, one in each of the same two chosen areas of specialization (POLI 811-815);
  - 1 core course in public policy (POLI 805), where public policy is one of the two chosen areas of specialization, the elective course is to be selected from a third area;
  - 1 elective course from any area of specialization or a cognate course in a related field;
  - 1 methods course (POLI 844).
- **Comprehensive Examination** (12 credits in the form of 2 comprehensive examinations). All candidates are required to write two 6-credit comprehensive exams in their two areas of specialization, so that they are deemed competent to teach at the university level in these two areas. For each area of specialization there will be a four-hour written exam and a one-hour oral defence of the exam within three weeks of writing the former. Students must pass the written exam to move forward to the oral exam, but can still fail an exam with an incompetent oral performance. If either part (written or oral) is failed, the student will be permitted one re-take of the entire exam both oral and written. If the student then fails either the written or oral part, the second failure will result in the student being withdrawn from the program.
- **Thesis Proposal** (3 credits). After completion of the course work and comprehensive exams, the candidate with the concurrence and assistance of the Graduate Program Director finalizes the three-member supervisory committee, consisting of the principal supervisor and two other members of the department. Students are required to complete and defend their thesis proposal before the supervisory committee in a meeting chaired by the Graduate Program Director. The thesis proposal will include a literature review and a fully justified research agenda. In cases where the supervisory committee is not satisfied with the proposal, the student can resubmit and re-defend. A second unsatisfactory proposal would result in the student being withdrawn from the program.
- **Thesis** (54 credits). The candidate who has passed the PhD Comprehensive Examinations and the thesis proposal will proceed to the final requirement. The final requirement is the writing and defence of an original doctoral thesis that contributes to one of the student's areas of concentration. It shall be of publishable quality, and the defence will be before the Chair (Dean of the School of Graduate Studies or representative) and a five-person voting examining committee including the student's original supervisory committee members (the principal supervisor and two other departmental members) and two external committee members (one external to the department within the university and one external to the university).

- **Language Requirement.** PhD candidates must pass an examination either in French or in a language (other than English) which is required in their area of research.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must maintain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** A graduate student who receives one grade of *C* will be evaluated by the Departmental Graduate Studies Committee with respect to that student's continuance in the program. Two C's will be grounds for automatic withdrawal from the program.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program.
- **Time Limit.** All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

The Department offers graduate courses in the following five core fields:

- Comparative Politics
- International Politics
- Canadian and Québec Politics
- Political Theory
- Public Policy and Administration

Core Courses

POLI 801 Advanced Seminar in Comparative Politics (3 credits)
This course is a survey of the field of comparative politics at an advanced level. It examines major theories, concepts and methods of comparative political analysis.

POLI 802 Advanced Seminar in International Politics (3 credits)
This course is a survey of core concepts of international politics at an advanced level. It examines major theoretical perspectives and their application to historical and contemporary international issues.

POLI 803 Advanced Seminar in Canadian and Québec Politics (3 credits)
This course is a survey of the field at an advanced level. It presents a discussion of contemporary issues and controversies in Canadian and Québec politics.

POLI 804 Advanced Seminar in Political Theory (3 credits)
This course is a survey of leading research in political theory and political philosophy, including the history of political thought, normative political theory and contemporary political thought.

POLI 805 Advanced Seminar in Public Policy and Public Administration (3 credits)
This course surveys several theoretical models and paradigms of public policy and public administration. It examines critically the intellectual and ideological traditions of policy analysis.

POLI 844 Research Design (3 credits)
This course explores differing research philosophies, the principles of research design and research strategies. It also considers philosophical critiques of different approaches and practical aspects of conducting research.

Elective Courses

POLI 811 Special Topics in Comparative Politics (3 credits)
Topics vary from year to year.

POLI 812 Special Topics in International Politics (3 credits)
Topics vary from year to year.

POLI 813 Special Topics in Canadian and Québec Politics (3 credits)
Topics vary from year to year.

POLI 814 Special Topics in Political Theory (3 credits)
Topics vary from year to year.

POLI 815 Special Topics in Public Policy and Public Administration (3 credits)
Topics vary from year to year.

POLI 898 Directed Studies (3 credits)
Prerequisite: Permission of the PhD Committee.
This special reading course is designed to explore topics and themes relevant to a student's doctoral research.

Comprehensive Exams

POLI 885 Comprehensive Exam (6 credits)
POLI 886 Comprehensive Exam (6 credits)

Thesis

POLI 889 Thesis Proposal (3 credits)
POLI 890 Thesis (54 credits)

Master of/Magisteriate in Arts (Public Policy and Public Administration) (MPPPA)

Options

Option A. Courses Only
Option B. Internship
Option C. Thesis

Upon application, students enter Option A (MPPPA with Courses only). Once admitted to the program, students have the opportunity to transfer to Option B (MPPPA with Internship) or Option C (MPPPA with Thesis). To enter either the Internship or Thesis option students must complete the prescribed coursework and normally achieve a minimum GPA of 3.30 for admission to Option B and 3.50 for Option C.

Admission Requirements. An undergraduate honours degree or the equivalent is required. Students who do not have the necessary background in public policy and public administration as well as in the concentration which they have chosen, may be required to take specific undergraduate courses in addition to the regular program. In certain cases, applicants may be required to complete a qualifying program in order to be eligible for admission to the graduate program.

Students who were educated outside Canada and whose mother tongue is neither English nor French will be required to successfully complete TOEFL (Test of English as a Foreign Language) exam before being admitted.

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to complete a minimum of 45 credits.
- **Core Courses.** All students must complete two 3-credit core courses, POLI 636 (Theories of Public Policy and Public Administration), and POLI 644 (Research Methods).
  In addition, students in Options A or B must take one of the following five courses: POLI 600 or 604 or 618 or 622 or 624.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.

- **Language Requirement.** Students in the Master of/Magisteriate in Arts (Public Policy and Public Administration) Option B Internship are expected to demonstrate an ability to read and understand literature relevant to their field in French.

Academic Regulations.

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students in research master's/magisteriate programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts (Public Policy and Public Administration)
Option A (Courses Only)

- **Core Courses.** POLI 636, 644, and one of the following five courses: POLI 600 or 604 or 618 or 622 or POLI 624 (9 credits).
- **Concentration Courses.** Four 3-credit courses chosen from the subfield of Public Policy and Administration (12 credits).
- **Approved Elective and Cognate Courses.** Four 3-credit courses chosen from any of the following subfields: Canadian and Quebec Politics, Comparative Politics, International Politics, Political Theory, or POLI 601 (Research Design), or from cognate courses offered in related disciplines. For cognate courses, approval of the Director is required. In some cases approval for registration in cognate courses must be obtained from the department involved (12 credits).
- **Extended Research Essay.** POLI 691. The Extended Research Essay is a directed study supervised by a faculty member with whom a student completed a course in their area of concentration. Requiring additional research, this degree requirement builds on a term paper submitted at the graduate level in a concentration course and is considered to be a significant revision and extension of that paper, with an extensive bibliography (12 credits).

Master of/Magisteriate in Arts (Public Policy and Public Administration)
Option B (Internship)

Language Requirement: All Option B candidates must pass an examination in French based on a test administered by the Department. This exam consists of translating a passage of literature, relevant to the field, from French into English.

- **Core Courses.** POLI 636, 644, and one of the following five courses POLI 600 or 604 or 618 or 622 or 624 (9 credits).
- **Concentration Courses.** Three 3-credit courses chosen from the subfield of Public Policy and Administration (9 credits).
- **Approved Elective and Cognate Courses.** Two 3-credit courses chosen from the following subfields: Canadian and Quebec Politics, Comparative Politics, International Politics, Political Theory, or POLI 601 (Research Design), or from cognate courses offered in related disciplines. For cognate courses, approval of the Director is required. In some cases approval for registration in cognate courses must be obtained from the department involved (6 credits).
- **Internship with Research Paper.** POLI 693. The internship is a four-month job placement in either the public or private sector. Under the direction of a faculty supervisor, the student prepares an original, theoretical work that comprises a series of policy recommendations that contribute to the policy process in Canada. The student is required to defend the paper before his/her faculty supervisor and two readers (21 credits).

Master of/Magisteriate in Arts (Public Policy and Public Administration)
Option C (Thesis)

- **Core Courses.** POLI 636, 644 (6 credits).
- **Concentration Courses.** Two 3-credit courses chosen from the subfield in which the student intends to write a thesis. Students can write a thesis in the following subfields: Public Policy and Administration, Canadian and Quebec Politics,International Politics, Comparative Politics and Political Theory. (6 credits).
- **Approved Elective and Cognate Courses.** Two 3-credit courses chosen from any of the following subfields: Public Policy and Administration, Canadian and Quebec Politics, Comparative Politics, International Politics, Political Theory, or POLI 601 (Research Design), or from cognate courses offered in related disciplines. For cognate courses, approval of the Director is required. In some cases approval for registration in cognate courses must be obtained from the department involved (6 credits).
- **Thesis Proposal.** POLI 694. This course is a directed study involving a comprehensive understanding of the literature in the area of research directly relevant to the thesis topic under the direction of a faculty supervisor. The written assignments involve a comprehensive literature review, annotated

bibliography and research design that culminate in a thesis proposal presented in an oral defence before the thesis supervisor and two faculty members in the graduate program.(3 credits).

- **Master's Thesis.** POLI 696. Students are required to demonstrate their ability to carry out original, independent research. The thesis, which is researched and written under the direction of a supervisor and thesis committee, is defended before the student's thesis committee (24 credits).

Courses

All courses are one-term, 3-credit courses unless otherwise indicated. Some sections of some courses may be offered in French.

Core Courses for students in Options A, B and C

POLI 636 Theories of Public Policy and Public Administration
POLI 644 Research Methods

Students in Options A and B must also take one of the following five core courses:

POLI 600 Public Policy and the Governmental Process in Canada
POLI 604 Comparative Public Policy
POLI 618 Canadian Public Administration
POLI 622 Comparative Public Administration
POLI 624 Public Administration of Intergovernmental Affairs.

Public Policy and Administration

POLI 600 Public Policy and the Governmental Process in Canada
POLI 604 Comparative Public Policy
POLI 605 Environmental Policy and Governance
POLI 607 Ageing and Public Policy
POLI 610 Economic Policy After Keynes
POLI 612 Public Policy and Business Cycles
POLI 617 Knowledge in International Relations
POLI 618 Canadian Public Administration
POLI 622 Comparative Public Administration
POLI 624 Public Administration of Intergovernmental Affairs
POLI 628 Ethics and Values in Public Policy Making
POLI 630 Organization Theory
POLI 634 Policy Analysis and Program Evaluation

POLI 635 Biotechnology, Agriculture and Food Policy
POLI 645 Indigenous Peoples and the State
POLI 648 Feminist Critiques of Public Policy
POLI 652 Science, Technology and Power
POLI 683 Special Topics in Public Policy and Administration
POLI 695 Directed Studies

Canadian and Quebec Politics

POLI 600 Public Policy and the Governmental Process in Canada
POLI 606 Policy Making and the National Purpose in Canada
POLI 607 Ageing and Public Policy
POLI 611 Judicial Politics and Policy
POLI 613 Political Socialization: A Comparative Perspective
POLI 615 The Politics of Citizenship in Canada
POLI 618 Canadian Public Administration
POLI 624 Public Administration of Intergovernmental Affairs
POLI 634 Policy Analysis and Program Evaluation
POLI 638 Seminar in Canadian and Quebec Politics
POLI 645 Indigenous Peoples and the State
POLI 658 Authors of the Political Imagination
POLI 684 Special Topics in Canadian and Quebec Politics
POLI 695 Directed Studies

Comparative Politics

POLI 604 Comparative Public Policy
POLI 613 Political Socialization: Comparative Perspective
POLI 621 Political Leadership and Decision Making
POLI 622 Comparative Public Administration
POLI 626 Seminar in Comparative Politics
POLI 629 Critical Perspectives in Development
POLI 637 Democracy and Regime Change
POLI 643 Rational and Public Choice
POLI 649 Gender and Global Politics
POLI 657 Nationalism and Ethnicity
POLI 681 Special Topics in Comparative Politics
POLI 695 Directed Studies

International Politics

POLI 603 International Relations Theory
POLI 605 Environmental Policy and Governance
POLI 608 Globalization and Regional Integration
POLI 614 Political Economy of Advanced Industrial Nations
POLI 616 Theories of Foreign Policy
POLI 617 Knowledge in International Relations
POLI 619 International Peacekeeping
POLI 646 History of Thought in Political Economy
POLI 647 International Human Security
POLI 649 Gender and Global Politics
POLI 659 International Organizations
POLI 662 International Political Economy
POLI 687 Special Topics in International Politics
POLI 695 Directed Studies

Political Theory

POLI 623 Ethics, Morality and Justice
POLI 625 Policy Discourse of Biotechnology
POLI 628 Ethics and Values in Public Policy Making
POLI 631 Political Texts
POLI 632 Seminar in Political Theory
POLI 646 History of Thought in Political Economy
POLI 654 Concepts of the State
POLI 658 Authors of the Political Imagination
POLI 685 Special Topics in Political Theory
POLI 695 Directed Studies

Research Design, Extended Research Essay, Internship with Research Paper, Thesis Proposal, Thesis

POLI 601 Research Design (3 credits)
POLI 691 Extended Research Essay (12 credits)
POLI 693 Internship with Research Paper (21 credits)
POLI 694 Thesis Proposal (3 credits)
POLI 696 Master's Thesis (24 credits)

Courses

All courses listed are one-term, 3-credit courses unless otherwise indicated. Some courses are offered in French.

Political Science

POLI 600 Public Policy and the Governmental Process in Canada
The course is designed to familiarize students with the structures and processes of policy-making in Canadian government. Particular attention is given to theories of public policy, the role of key institutions and agencies in the formulation and analysis of policy, and recent organizational developments in the executive-bureaucratic arena.

POLI 601 Research Design
This course explores differing research philosophies, the principles of research design and research strategies. It also considers philosophical critiques of different approaches and practical aspects of conducting research.
Note: Students who have received credit for this topic under a POLI 685 number may not take this course for credit.

POLI 603 International Relations Theory
This course explores the major theories, approaches and contemporary debates within international relations theory. Topics include the development of realism, liberalism, constructivism and critical approaches. Major aspects of international relations theory, such as security, political economy, and international organization, are also explored.

POLI 604 Comparative Public Policy
This course analyses policy development in industrialized countries. It focuses on various areas such as economic, education, fiscal and social policies. Moreover, this course examines contributions that address methodological issues related to comparative research.

POLI 605 Environmental Policy and Governance
Students in this seminar course conduct a theoretical and empirical survey of contemporary approaches to environmental policy development and implementation at various levels of governance, including municipal, national and international. Case studies may include toxic waste, oceans management, the impact of trade agreements, biodiversity conservation, and climate change.

POLI 606 Policy Making and the National Purpose in Canada
This course focuses upon the American challenge to Canadian independence in the economic, cultural, defence and other spheres, and examines policy initiatives taken by Canadian governments and the various proposals advanced by nationalist groups to meet this challenge.

POLI 607 Ageing and Public Policy

Substantial improvement in health, hygiene and working conditions combined with declining fertility rate is creating an important demographic shift. As a result, the number of individuals aged 65 and above is expected to double by 2031. This has multiple policy and political consequences across industrialized countries. The object of this course is to analyze this demographic shift from a comparative perspective.
Note: Students who have received credit for this topic under a POLI 681 number may not take this course for credit.

POLI 608 Globalization and Regional Integration

A study of the long range historical tendencies towards large and complex interdependent organizations in the post industrial world. These trends juxtapose the regional confederation of the European community as well as the rising trade blocs of North America and the Pacific, with the development of a single political economic and cultural super-system of global scope.

POLI 610 Economic Policy After Keynes

This course introduces students to the controversy surrounding the economics of Keynes and the implications of his work for the current problems of unemployment and growth. Interpretations of Keynes are explored in the context of the current eclipse of Keynesianism in public policy circles.

POLI 611 Judicial Politics and Policy

This course considers the increased policy-making functions of Supreme Courts in systems that have statutory and entrenched bills of rights. By focusing on the interaction between courts and legislatures, and the increasing use of litigation strategies by interest groups, the implications of public policy in a rights context are examined.

POLI 612 Public Policy and Business Cycles

This course explores the public policy of managing the business cycle. The emphasis is on both the theoretical literature associated with modern notions of managing the economic cycle and on applied case studies. The focus is both Canadian and comparative.

POLI 613 Political Socialization: A Comparative Perspective

The course presents an overview of the central concepts and theories used in political socialization research. Students learn about the major sources of political opinions, attitudes and values. This course also investigates how political socialization is used in practice in Canadian politics and within several other sub-disciplines of political science.
Note: Students who have received credit for this topic under a POLI 683 number may not take this course for credit.

POLI 614 Political Economy of Advanced Industrial Nations
The course provides an overview of the scholarly debate and research on political economy issues considered central to an examination of the political economy of advanced countries.

POLI 615 The Politics of Citizenship in Canada
This course examines key debates in the study and practice of citizenship in Canada. It explores the different forces which are transforming our understanding of citizenship, including globalization, nationalism, welfare state reform, international migration, and multiculturalism. Topics include citizenship and social exclusion; social rights and the welfare state; and economic citizenship, employment and social identity.
Note: Students who have received credit for this topic under POLI 685J may not take this course for credit.

POLI 616 Theories of Foreign Policy
This course explores the major international and domestic determinants of foreign policy. Principal topics include the influence of the international system, geography, leadership, regime-type, transnationalism and non-governmental organizations on foreign policy. Rather than focusing on any particular country, the course draws upon the experiences of a variety of Western democratic states utilizing case studies of American, British, French and Canadian foreign policy to illustrate and evaluate course themes.

POLI 617 Knowledge in International Relations
This course examines the creation and use of expertise in policy-making, including questions of knowledge construction, the sway of science versus norms on decision-makers, and the impact of bureaucratic processes on the quality of policy. Alternative conceptions of knowledge and its effects on decision-making from political science, sociology, economics, and psychology are applied to issues including national security, environmental politics and economics.
Note: Students who have received credit for this topic under a POLI 687 number may not take this course for credit.

POLI 618 Canadian Public Administration
Discussion is directed towards an understanding of public administration in the Canadian federal setting. Some of the main problems of public administration are related to important changes which have taken place over the last twenty years and which are continuing to take place.

POLI 619 International Peacekeeping
This course is a seminar on the theory and practice of multinational peace and stability operations. The course covers theoretical perspectives on peace operations; the origins and evolution of peace operations, with particular focus on the expansion and transformation of peace operations since the end of the Cold War; the organizational and international politics of peace operations; causes of peace operations' success and failure; problems of managing and coordinating actors involved in peace operations; and prospects for

organizational learning and reform. The course examines specific cases of peacekeeping, peacebuilding and peace enforcement.
Note: Students who have received credit for this topic under a POLI 687 number may not take this course for credit.

POLI 621 Political Leadership and Decision Making
This course considers the ways political actors attempt policy and institutional changes through an examination of leadership skills and decision making styles. It considers the philosophical treatments by Plato and Machiavelli and the relationship between morality and leadership by analyzing modern leadership within a constrained constitutional context.
Note: Students who have received credit for this topic under POLI 687M may not take this course for credit.

POLI 622 Comparative Public Administration
A comparative study of the public administration systems in various western countries with emphasis on a comparison vis-à-vis the Canadian federal system.

POLI 623 Ethics, Morality and Justice
This course focuses on the essential political concepts of ethics, justice and morality which underlie and motivate almost all political activity. The course explores both ancient and contemporary perspectives on the meaning of these concepts and examines the problems and theoretical challenges that arise when a definitive notion of justice is used to assess or generate public policy.
Note: Students who have received credit for this topic under a POLI 685 number may not take this course for credit.

POLI 624 Public Administration of Intergovernmental Affairs
This course deals with intergovernmental affairs that have become a significant part of the policy process in many countries. An analysis of power relations in the federal state, both in institutional and societal terms, will be a primary focus of this course. The Canadian case will serve as the main area of inquiry.

POLI 625 Policy Discourse of Biotechnology
This course examines the philosophical, political, and theoretical counsel to policymakers and broader public discourse surrounding the development and implementation of new laws and regulations pertaining to issues in advanced biotechnology, such as cloning, stem cell research, and psychopharmacology.
Note: Students who have received credit for this topic under a POLI 685 number may not take this course for credit.

POLI 626 Seminar in Comparative Politics
This course is a survey of the field of comparative politics. It examines major theories, concepts and methods of comparative political analysis.

Note: Students who have received credit for this topic under a POLI 681 number may not take this course for credit.

POLI 628 Ethics and Values in Public Policy Making
This course provokes critical thinking on value judgements underlying policy-making and familiarizes students with practical measures available for promoting integrity in public institutions. Students examine the principles underlying ethical standards, various professional codes of ethics, issues such as potential conflicts between personal convictions and public duties, and the ethical responsibility of public officials and civil servants in democratic societies.

POLI 629 Critical Perspectives in Development
This course examines key debates surrounding the concept and the politics of development in the 'less developed' world with a particular emphasis on institutional structures, such as the state, the market and non-governmental organizations, through which development has been pursued.
Note: Students who have received credit for this topic under POLI 687K may not take this course for credit.

POLI 630 0rganizational Theory
This is a seminar in organization theory, an interdisciplinary field concerned with the sources, determinants, functions, and effects of complex organizations. The course focuses on political organizations and the political effects of organizations by reviewing the historical development of organization theory and considering how current debates help us understand the nature and functions of organizations in the twenty-first century. Topics include the nature and sources of formal organizations; organizational structure; organizational decision-making; organizational culture; organizational reliability and failure; and the interaction between organizations and their environments.

POLI 631 Political Texts
The course is an intensive study of a text by a major author such as Plato, Machiavelli, Hobbes, or Nietzsche. Students systematically explore the issues and problems raised by the text and the interpretive traditions that follow from it.
Note: Students who have received credit for this topic under a POLI 685 number may not take this course for credit.

POLI 632 Seminar in Political Theory
This course is a survey of leading research in and approaches to political theory and political philosophy, including the history of political thought, normative political theory and contemporary political thought.
Note: Students who have received credit for this topic under a POLI 685 number may not take this course for credit.

POLI 634 Policy Analysis and Program Evaluation
This course focuses upon methods of assessing consequences of public policies. The main purpose of the course is to allow students to survey evaluation research in political science and to present research designs that will enable them to make plausible assumptions about the outcome of governmental programs in the absence of experimental control.

POLI 635 Agriculture, Biotechnology and Food Policy
The purpose of this course is to explore the ethical and policy dilemmas that rapid scientific and technological advances in biotechnology pose for issues of agriculture and food security. The course focuses on Canadian policy within a comparative perspective and examines alternative policy responses, such as found in the US, EU and developing countries.
Note: Students who have received credit for this topic under a POLI 685 number may not take this course for credit.

POLI 636 Theories of Public Policy and Public Administration
The course explores the diverse intellectual and ideological origins of Public Administration and Public Policy. The focus is on the comparative and critical analysis of the theoretical models under study. Students are encouraged to think analytically and to apply theoretical frameworks to their own empirical enquiries.

POLI 637 Democracy and Regime Change
This seminar examines the various definitions and understandings of democratic and authoritarian regimes and the principal moments of regime change (breakdown, transition, post-transition, and consolidation). It focuses on institution-building, the actors involved in the process of regime change and the political economy of transitions.
Note: Students who have received credit for this topic under POLI 687B may not take this course for credit.

POLI 638 Seminar in Canadian and Quebec Politics
This course is a survey of the field at an advanced level. It presents a discussion of contemporary issues and controversies in Canadian and Quebec Politics.
Note: Students who have received credit for this topic under a POLI 683 number may not take this course for credit.

POLI 643 Rational and Public Choice
This course deals with understanding the micro-analytical foundations of individual and group behaviour in political life. It introduces students to the main concepts, theorems and their applications in positive analytical politics including game theory, spatial modeling and institutional analysis.
Note: Students who have received credit for this topic under POLI 687C may not take this course for credit.

POLI 644 Research Methods
This course introduces students to the logic and methodology of Political Science research and public policy analysis.

POLI 645 Indigenous Peoples and the State
This course examines the political and administrative context in which Indigenous Peoples and the state coexist as well as the tensions between European and Indigenous modes of governance. It focuses on the evolution of institutions and policies regulating this relationship, and the governance strategies developed consistent with Indigenous traditions. The Canadian case serves as the focus but other countries may be considered.
Note: Students who have received credit for this topic under POLI 683M may not take this course for credit.

POLI 646 History of Thought in Political Economy
This course presents a survey of the major ideas which have shaped the various approaches to political economy from the classical theorists to twentieth century thinkers. The historical and contemporary influence of these ideas on public policy is evaluated.

POLI 647 International Human Security
An introduction to the growing literature and controversies surrounding the concept of 'human security' in international politics, applied specifically to the Canadian foreign policy context. Examined actors include states, non-governmental organizations, international institutions, and 'civil society'.
Note: Students who have received credit for this topic under POLI 687O may not take this course for credit.

POLI 648 Feminist Critiques of Public Policy
This course provides an in-depth examination of feminist and critical perspectives of public policy and administration. The course seeks to examine the ways in which social location is implicated in (and mediated by) public policy theory and practice. Specific topics may include the state of bureaucracy, state-society relations, public policy discourses, structures, processes and outcomes, and substantive issue areas, such as body politics, social and economic policy, and the labour market.
Note: Students who have received credit for this topic under a POLI 683 number may not take this course for credit.

POLI 649 Gender and Global Politics
This seminar focuses on the intersection of the global and the local through different methodological and theoretical approaches to the study of gender. Drawing from texts from the fields of comparative politics, international relations and sociology, the course exposes class participants to different scholarly treatments of gender and politics especially as these treatments have evolved in a post-Cold War era of increasing globalization.

POLI 652 Science, Technology and Power
This course introduces students to the growing field of science policy analysis. It provides an overview of the theoretical approaches and analytical tools used in the area and critically discusses various policy mechanisms now in place as well as current and emerging issues.

POLI 654 Concepts of the State
This course examines several of the most significant attempts made by modern political thinkers to answer the question, "What is the modern state?" It addresses both the historical emergence of the modern state and the various ways that this emergence has been theorized. Special emphasis is placed on the differences and interconnections between historical, theoretical, and practical questions.

POLI 657 Nationalism and Ethnicity
This seminar discusses the nature, dynamics and consequences of nationalism. The emphasis is placed on presenting and discussing various theoretical understandings of identity and nationalist mobilization. It examines conceptual issues relating to the study of nationalism, namely the nature, origins and characterizations of nations and nationalism and the strategies for regulation of nationalist conflict.
Note: Students who have received credit for this topic under POLI 687H may not take this course for credit.

POLI 658 Authors of the Political Imagination
This course examines a broad range of literary and non-literary genres for their potential to inform and redirect the political imagination. The seminar adopts a broadly comparative perspective on literature, culture, politics and individual motivation.

POLI 659 International Organizations
This course explores the role of international organizations, institutions and regimes in world politics. The course covers intergovernmental and non-governmental organizations as well as informal institutional arrangements. It surveys theoretical debates regarding the origins, dynamics, and significance of international organizations, and examines their role in areas such as international security, international political economy, and regional integration. The course also considers debates over democratic accountability within international organizations and the efficacy of global governance.
Note: Students who have received credit for this topic under a POLI 687 number may not take this course for credit.

POLI 662 International Political Economy
This course covers theories from macroeconomics and international relations and their application to major historical and contemporary events in the evolution of the global political economy. Topics include international trade and finance, economic development,regional integration and globalization, North-South relations, the emergence of multinational corporations, and international organizations such as the World Bank, IMF, WTO, OECD, and UNCTAD.

POLI 681 Special Topics in Comparative Politics

POLI 683 Special Topics in Public Policy and Administration

POLI 684 Special Topics in Canadian and Quebec Politics

POLI 685 Special Topics in Political Theory

POLI 687 Special Topics in International Politics

POLI 691 Extended Research Essay (12 credits)
The Extended Research Essay is a directed study supervised by a faculty member with whom a student completed a course in their area of concentration. Requiring additional research, this degree requirement builds on a term paper submitted at the graduate level in a concentration course and is considered to be a significant revision and extension of that paper, with an extensive bibliography.

POLI 693 Internship with Research Paper (21 credits)
The Internship is a four-month job placement in either the public or private sector. Under the direction of a faculty supervisor, the student prepares an original, theoretical work that comprises a series of policy recommendations that contribute to the policy process in Canada. The student is required to defend the paper before his/her faculty supervisor and two readers.

POLI 694 Thesis Proposal (3 credits)
This course is a directed study involving a comprehensive understanding of the literature in the area of research relevant to the thesis topic under the direction of a faculty supervisor. The written assignments involve a comprehensive literature review, annotated bibliography and research design that culminate in a thesis proposal presented in an oral defence.

POLI 695 Directed Studies
Independent study in the area of concentration.

POLI 696 Master's Thesis (24 credits)
Students are required to demonstrate their ability to carry out original, independent research. The thesis, which is researched and written under the direction of a supervisor and thesis committee, is defended before the student's thesis committee.

Cognate Courses

Students may enrol in cognate courses in the John Molson School of Business and in the Departments of Communication Studies, Economics, Education, and Sociology and Anthropology in the Faculty of Arts and

Science. Permission of the Graduate Program Directors of both the Master of/Magisteriate in Arts (Public Policy and Public Administration) and the second department is required.

Psychology

▪ Back to Original Version

Psychology Website

Doctor of/Doctorate in Philosophy (Psychology)
Master of/Magisteriate in Arts (Psychology)
Diploma in Clinical Psychology

Specific Information about all Programs

Admission Requirements. Admission to the PhD degree requires a master's degree in psychology from a recognized university. Admission to the MA degree requires an honours degree in psychology or its equivalent. Enrolment in these programs is limited in part by the availability of research supervisors and, for the Research and Clinical Training Option, by space in that option.

Applicants are selected on the basis of past academic record, letters of recommendation, the results of the Graduate Record Examination (optional, but highly recommended), and the relevance of their proposed research to the research expertise of the faculty. Students successfully completing their master's program in psychology at Concordia University need submit only an application form and letters of recommendation when applying for the doctoral degree. Psychology graduate courses are not open to graduate-level independent students, except in specific circumstances as defined by the department.

Upon recommendation of their thesis supervisor, students enrolled in the Master of Arts (Psychology) program at Concordia University who have completed a minimum of 12 credits of graduate level course work and who have shown high academic performance and potential through performance in research may apply for accelerated admission to doctoral studies without submitting a master's thesis. Approval for accelerated admission must be obtained from the student's thesis committee and the graduate admissions subcommittee by August 15 to allow entry into the PhD program in the Fall term. Students in the Research and Clinical Training option may not obtain accelerated admission to the PhD program from MA Year I, but may apply for accelerated admission, upon recommendation of their thesis supervisor, from MA Year II.

Undergraduate Teaching. Students are encouraged to take opportunities to assist in undergraduate teaching. The department treats such teaching as part of the student's learning experience. Discussion of

aims and techniques as well as advice and criticism will be involved as part of the training that students obtain as teaching assistants.

Colloquia. All students are expected to attend departmental colloquia.

Language Requirements. Although no formal language courses or examinations are required, students intending to work in Quebec are strongly encouraged to develop a working knowledge of French. Students who plan to seek admission to the Order of Quebec Psychologists (OPQ) are advised that Article 46 of the professional code of the Province of Quebec states that a working knowledge of French is required for professional certification.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students receiving a grade of *C* in two courses will have their status within the program reviewed by the Graduate Committee. Normally a *C* in two courses is grounds for withdrawal. In cases of extenuating circumstances probationary continuation in the program will be considered.
- **F Rule.** Students receiving a failing grade in the course of their studies will have their status within the program reviewed by the Graduate Committee. Normally a failing grade is grounds for withdrawal. In the case of withdrawal, students may apply for re-admission.
- **Time Limits.** All work for the PhD degree must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study.
  All work for the MA degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
  All work for the Diploma in Clinical Psychology must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Doctor of/Doctorate in Philosophy (Psychology)

Requirements for the Degree

- **Residence.** The minimum residence requirement is two years (6 terms) of full-time study beyond the MA degree, or the equivalent in part-time study.
- **Credits.** A fully-qualified candidate is required to complete a minimum of 90 credits, including Core courses and elective Options.

Core Courses:

- Students are required to complete 72 credits of core courses as follows: PSYC 801, 802 (6 credits); PSYC 880 (0 credit); PSYC 890 (60 credits); PSYC 721, 724, 725, 726 or 727 (6 credits).
- **Comprehensive Examination.** Students are required to write a comprehensive examination (PSYC 880) within 12 months of being admitted for the degree. The examination will be in two parts, one dealing with general issues and the other with the candidate's area of specialization.
- **Thesis.** The research will be undertaken within one or more of the areas of research specialization of the department (Behavioural Neuroscience, Clinical and Health Research, Human Development and Developmental Processes, and Cognitive Science) under the supervision of a faculty member. The thesis is expected to make a significant contribution to the advancement of knowledge. The content and form of the thesis must be approved by a departmental committee prior to submission to the School of Graduate Studies. For purposes of registration, this work will be designated as PSYC 890: Research and Thesis (60 credits).

Research Option (18 credits):

In addition to the core courses, students select from the following sets of courses for a maximum of 18 credits:

- PSYC 844, 845, 846 or 847 (3 to12 credits). Each 3-credit seminar may be taken up to 4 times as an elective option provided the topic differs.
- PSYC 700, 701, 714, 716, 721, 724, 725, 726,727, 734, 850, or 851 (6-15 credits). Special Topics seminars PSYC 721, 724, 725, 726, and 727 may be taken up to 5 times as an elective option provided the topic differs.

Research and Clinical Training Option (18 credits):

In addition to the core courses, students select from the following sets of courses for a maximum of 18 credits:

- PSYC 823, 824, or 825 (3 credits); PSYC 834 (3 credits); PSYC 835, 836, or 837 (3 credits); PSYC 841, 842, or 843 (3 credits); PSYC 838, 839, or 840 (3 credits); and PSYC 885 (3 credits)
- At least one adult and one child client must be seen in the required practicum courses ((APC Practicum II or III, Extramural Practicum I). All students following the Research and Clinical Training Option are expected to attend case conferences at the Applied Psychology Centre training clinic.

Master of/Magisteriate in Arts (Psychology)

Requirements for the Degree (Research Option)

- **Residence.** The minimum period of residence is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits consisting of course work and thesis as follows: PSYC 601 (3 credits); PSYC 644, 645, 646, or 647 (3 credits); PSYC 714 (6 credits); 3 credits selected in consultation with the thesis supervisor from among PSYC 700, 716, 721, 724, 725, 726, 727 or 734; and PSYC 690 (30 credits).
- **Thesis.** The student must submit a thesis on a topic relating to one or more of the areas of research specialization of the department (Behavioural Neuroscience, Clinical and Health Research, Human Development and Developmental Processes, and Cognitive Science) chosen in consultation with his or her thesis supervisor. Topics must be approved by a committee of the department. The thesis shall be read and graded by the student's thesis director and by at least two other scholars, one of whom may be an outside examiner. For purposes of registration, this work will be designated as PSYC 690: Research and Thesis (30 credits).
- **Thesis Examination.** The student must defend the thesis and demonstrate knowledge of the field in which the thesis falls in an oral examination before a committee of the department.

Requirements for the Degree (Research and Clinical Training Option)

- **Residence.** The minimum period of residence is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits consisting of course work and thesis as follows: PSYC 601 (3 credits); PSYC 644, 645, 646, or 647 (0 credits); PSYC 700 (3 credits); PSYC 714 (6 credits; PSYC 734 (3 credits); and PSYC 690 (30 credits).Students in this option will concurrently complete the courses indicated under Diploma in Clinical Psychology.
- **Thesis.** The student must submit a thesis on a topic relating to one or more of the areas of research specialization of the department (Behavioural Neuroscience, Clinical and Health Research, Human Development and Developmental Processes, and Cognitive Science) chosen in consultation with his

or her thesis supervisor. Topics must be approved by a committee of the department. The thesis shall be read and graded by the student's thesis director and by at least two other scholars, one of whom may be an outside examiner. For purposes of registration, this work will be designated as PSYC 690: Research and Thesis (30 credits).

- **Thesis Examination.** The student must defend the thesis and demonstrate knowledge of the field in which the thesis falls in an oral examination before a committee of the department.

Diploma in Clinical Psychology

The Diploma in Clinical Psychology provides students enroled in the MA in Psychology (Research and Clinical Training Option) with clinical coursework and practica qualifying them for further clinical training provided in the PhD in Psychology (Research and Clinical Training Option).

Admission Requirements

The Diploma in Clinical Psychology is open only to students enrolled in the MA or PhD in Psychology (Research and Clinical Training Option).

Requirements for the Diploma in Clinical Psychology consist of 10 courses.

- **Credits.** (30 credits) Students are required to complete 30 credits as follows:
- **Courses.** PSYC 701, 702, 703, 704, 705, 706, 707, 720 (24 credits); PSYC 708, 709, or 710 (3 credits); and PSYC 711, 712, or 713 (3 credits).

Courses

The following are 3-credit courses unless otherwise indicated.

PSYC 601 Statistical Analysis and Experimental Design
A detailed consideration of selected issues in Psychological statistics. Topics include parametric and non-parametric techniques, analysis of variance, power of statistical tests, and hypothesis testing.

PSYC 644 Clinical and Health Research Area Seminar I
A seminar in which current research of faculty and students in clinical and health psychology is presented and discussed.

PSYC 645 Cognitive Science Area Seminar I
A seminar in which current research of faculty and students in cognitive science is presented and discussed.

PSYC 646 Human Development Area Seminar I
A seminar in which current research of faculty and students in human development and developmental processes is presented and discussed.

PSYC 647 Behavioural Neuroscience Area Seminar I
A seminar in which current research of faculty and students in behavioural neuroscience is presented and discussed.

PSYC 690 Research and Thesis (30 credits)

PSYC 700 Psychopathology
Prerequisite: Undergraduate course in behaviour disorders or equivalent.
This seminar deals with historical and current approaches to the study of behaviour disorders and problems of life adjustment in both adults and children, including critical evaluation of empirical findings in selected areas. Classification systems, including the current revision of the APA Diagnostic and Statistical Manual, are critically reviewed. Students with credit for PSYC 660 or 860 may not take this course for credit.

PSYC 701 Models of Assessment I
Prerequisite: PSYC 700; *Co-requisite:* PSYC 706 or permission of the Director of Clinical Training.
Focusing on cognitive and ability testing of children and adults, this course stresses the conceptual bases of ability testing, research results and their implications for test interpretation, and strengths and limitations of current test batteries for children and adults. Specific course content includes: a) measurement theory, including issues of test construction, reliability, validity, and evaluation; b) appropriate use and interpretation of specific cognitive assessment batteries (e.g. the Wechsler and Stanford-Binet scales for children and adults); and c) special assessment issues, including the testing of minorities and assessment-related ethical problems. A practicum in assessment techniques (PSYC 706) is typically taken in conjunction with this course.

PSYC 702 Models of Assessment II
Prerequisite: PSYC 701; *Co-requisite:* PSYC 707 or permission of the Director of Clinical Training.
This course is a continuation of Assessment I, and focuses on the measurement of behaviour related directly to personality and/or behaviour disorders in both adult and child populations. Interviewing, projective techniques and structural (quantitative) tests of personality such as the MMPI and CPI are included. The course stresses the evaluation of assessment procedures in terms of reliability and validity issues, and focuses on the selection and use of assessment procedures for specific types of prediction. The course also stresses the integration of assessment procedures into treatment planning and evaluation.

PSYC 703 Psychological Treatment I: Foundations and Systems
Prerequisite: PSYC 700.

Models of psychological intervention with both adults and children are examined with respect to: a) theoretical formulations and etiological assumptions; b) treatment objectives and strategies; c) issues related to the application of these models; d) the efficacy of treatment procedures, including general issues in outcome research. The major emphases are on behavioural and psychodynamic approaches. Among other topics, the ethics of therapeutic interventions are discussed.

PSYC 704 Psychological Treatment II: Empirically Supported Interventions
Prerequisite: PSYC 703.
A continuation of PSYC 703. Psychological Treatment I: Foundations and Systems.

PSYC 705 APC Practicum I
Prerequisite or Co-requisite: PSYC 700 and permission of the Director of Clinical Training.
Students participate in case supervision, observe and/or assist with clients in therapy, and attend case conferences at the Applied Psychology Centre (APC).

PSYC 706 Assessment Practicum I (1 credit)
Prerequisite or Co-requisite: PSYC 701, 705 and permission of the Director of Clinical Training.
This course focuses on the practical applications of the material discussed in Models of Assessment I (PSYC 701). Students administer intellectual tests under supervision. Techniques for administration, interpretation and report-writing of specific test batteries suitable for adults and children are stressed.

PSYC 707 Assessment Practicum II (2 credits)
Prerequisite: PSYC 706, *Co-requisite:* PSYC 702, and permission of the Director of Clinical Training.
This course focuses on the practical applications of the material discussed in models of Assessment II (PSYC 702). Students administer personality tests under supervision. Techniques for administration, interpretation and report writing of specific assessment test batteries suitable for adults and children are stressed.

PSYC 708 APC Practicum II: General
Prerequisite or Co-requisite: PSYC 703, 704, 706, 707 and permission of the Director of Clinical Training.
The focus of this course is the practical applications of the material discussed in Models of Assessment II and Models of Behaviour Change I and II PSYC 702, 703 and 704. Students are responsible for the assessment and treatment of selected clients of the Applied Psychology Centre under faculty supervision.

PSYC 709 APC Practicum II: Adult
Prerequisite or Co-requisite: PSYC 703, 704, 706, 707 and permission of the Director of Clinical Training.
The focus of this course is the practical applications of the material discussed in Models of Assessment II and Models of Behaviour Change I and II PSYC 702, 703 and 704. Students are responsible for the assessment and treatment of selected adult clients of the Applied Psychology Centre under faculty supervision.

PSYC 710 APC Practicum II: Child
Prerequisite or Co-requisite: PSYC 703, 704, 706, 707 and permission of the Director of Clinical Training.
The focus of this course is the practical applications of the material discussed in Models of Assessment II and Models of Behaviour Change I and II PSYC 702, 703 and 704. Students are responsible for the assessment and treatment of selected child clients of the Applied Psychology Centre under faculty supervision.

PSYC 711 Extramural Practicum I: General (non-credit)
Prerequisite: PSYC 701, 702, 703, 704, 706, 707 and permission of the Director of Clinical Training.
A four-month extramural practicum done under qualified supervisors in an applied setting approved by the department's internship committee, e.g., hospitals, clinics, schools, community and rehabilitation centres.

PSYC 712 Extramural Practicum I: Adult (non-credit)
Prerequisite: PSYC 701, 702, 703, 704, 706, 707 and permission of the Director of Clinical Training.
A four-month extramural practicum with adult clients, done under qualified supervisors in an applied setting approved by the department's internship committee, e.g. hospitals, clinics, schools, community and rehabilitation centres.

PSYC 713 Extramural Practicum I: Child (non-credit)
Prerequisite: PSYC 701, 702, 703, 704, 706, 707 and permission of the Director of Clinical Training.
A four-month extramural practicum with child clients, done under qualified supervisors in an applied setting approved by the department's internship committee, e.g., hospitals, clinics, schools, community and rehabilitation centres.

PSYC 714 Central Topics in Psychology (6 credits)
This general seminar deals with basic theoretical and research issues in Psychology. Topics are drawn from a wide range of areas in Psychology including perceptual and cognitive processes, learning, motivation, and psycho-pathology. Issues are considered with respect to developmental, physiological and social approaches. Students who have received credit for PSYC 602 may not take this course for credit.

PSYC 715 Vision and Audition
A seminar on physical, physiological and psychological aspects of visual and auditory perception with special emphasis on the comparison between normal and defective vision and hearing.

PSYC 716 Advanced Human Development
This seminar on theory and research focuses on human development and developmental processes. Subject matter will vary from term to term and from year to year. Students may re-register for this course, provided that the course content has changed. Change in content will be indicated by the letter following the course number.

PSYC 720 Seminar on Ethical and Professional Issues

Prerequisite or Co-requisite: PSYC 834 or permission of the Director of Clinical Training.

In this biweekly seminar, ethical and professional issues in clinical psychology are considered through case presentations by students, faculty and guest clinicians. The ethical principles of national accrediting bodies and of the Order of Psychologists of Québec are reviewed.

PSYC 721 Special Topics Seminar

This seminar provides an advanced treatment of specialized research literature in an integrative or selected area of psychology outside the department's major areas of specialization. It may be offered as a seminar, tutorial or directed reading course, or in any other format, subject to approval of the program director.

Subject matter varies from term to term and from year to year. Students may register for this course up to 5 times provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PSYC 721A, PSYC 721B. Students with credit for PSYC 603 or 803 may take this course for credit only if the subject matter is different.

PSYC 724 Special Topics in Clinical and Health Psychology

This course provides an advanced treatment of specialized research literature in an area of clinical and/or health psychology. It may be offered as a seminar, tutorial or directed reading course, or in any other format, subject to approval of the program director.

Subject matter varies from term to term and from year to year. Students may register for this course up to 5 times provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PSYC 724A, PSYC 724B. Students with credit for PSYC 603, 721, 803, or 805 may take this course for credit only if the subject matter is different.

PSYC 725 Special Topics in Cognitive Science

This course provides an advanced treatment of specialized research literature in an area of cognitive science. It may be offered as a seminar, tutorial or directed reading course, or in any other format, subject to approval of the program director.

Subject matter varies from term to term and from year to year. Students may register for this course up to 5 times provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PSYC 725A, PSYC 725B. Students with credit for PSYC 603, 721, 803, or 805 may take this course for credit only if the subject matter is different.

PSYC 726 Special Topics in Human Development

This course provides an advanced treatment of specialized research literature in an area of human development and developmental processes. It may be offered as a seminar, tutorial or directed reading course, or in any other format, subject to approval of the program director.

Subject matter varies from term to term and from year to year. Students may register for this course up to 5 times provided that the course content has changed. Changes in content are indicated by the letter

following the course number, e.g. PSYC 726A, PSYC 726B. Students with credit for PSYC 603, 721, 803, or 805 may take this course for credit only if the subject matter is different.

PSYC 727 Special Topics in Behavioural Neuroscience
This course provides an advanced treatment of specialized research literature in an area of behavioural neuroscience. It may be offered as a seminar, tutorial or directed reading course, or in any other format, subject to approval of the program director.
Subject matter varies from term to term and from year to year. Students may register for this course up to 5 times provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PSYC 727A, PSYC 727B. Students with credit for PSYC 603, 721, 803, or 805 may take this course for credit only if the subject matter is different.

PSYC 734 Multivariate Statistics
Prerequisite: PSYC 601.
Building upon material presented in PSYC 601, this course covers multivariate procedures, includes MANOVA, cluster analysis, canonical correlation, factor analysis, structural equation modelling, and multilevel modelling.
Note: Students who have received credit for PSYC 730 or PSYC 732 may not take this course for credit.

PSYC 801 Research Seminar I
A seminar attended by all doctoral students in which specific research proposals and related theoretical issues and methodological problems are presented for discussion by students and participating faculty.

PSYC 802 Research Seminar II
A continuation of PSYC 801.

PSYC 823 APC Practicum III: General
Prerequisite: PSYC 708 (or 709 or 710), 711 (or 712 or 713). *Prerequisite or Co-requisite:* PSYC 834, 835 (or 836 or 837), and permission of the Director of Clinical Training.
Advanced students are expected to begin to define clinical interests and treatment methods consonant with their career goals. They receive the appropriate clinical experience and supervision in this practicum (e.g., working with children, adolescents, adults, working with clients who present particular types of problems).

PSYC 824 APC Practicum III: Adult
Prerequisite: PSYC 708 (or 709 or 710), 711 (or 712 or 713). *Prerequisite or Co-requisite:* PSYC 834, 835 (or 836 or 837), and permission of the Director of Clinical Training.
Advanced students are expected to begin to define clinical interests and treatment methods consonant with their career goals. They receive the appropriate clinical experience and supervision in this practicum

working with adult clients, e.g. working with a particular orientation and/or with particular types of problems.

PSYC 825 APC Practicum III: Child
Prerequisite: PSYC 708 (or 709 or 710), 711 (or 712 or 713). *Prerequisite or Co-requisite:* PSYC 834, 835 (or 836 or 837), and permission of the Director of Clinical Training.
Advanced students are expected to begin to define clinical interests and treatment methods consonant with their career goals. They receive the appropriate clinical experience and supervision in this practicum working with child clients and families, e.g. working with a particular orientation and/or with particular types of problems.

PSYC 826 APC Practicum IV: General
Prerequisite: PSYC 823 (or 824 or 825) and permission of the Director of Clinical Training.
This course is a specialized practicum for advanced students involving clinical experience under supervision.

PSYC 827 APC Practicum IV: Adult
Prerequisite: PSYC 823 (or 824 or 825) and permission of the Director of Clinical Training.
This course is a specialized practicum for advanced students involving clinical experience with adult clients under supervision.

PSYC 828 APC Practicum IV: Child
Prerequisite: PSYC 823 (or 824 or 825) and permission of the Director of Clinical Training.
This course is a specialized practicum for advanced students involving clinical experience with child clients under supervision.

PSYC 834 Advanced Clinical Seminar I
Prerequisite: PSYC 711 (or 712 or 713), 708 (or 709 or 710), and permission of Director of Clinical Training.
This seminar provides an advanced treatment of issues in current psychological theory and research that are relevant to clinical practice, e.g., causal models and their assumptions, legal and ethical issues, classification by state, trait, and situational context; brain-behaviour relations. The aims are to foster in students a) regular review of clinically relevant literature; b) a critical perspective regarding current clinical practices; and c) guidelines and criteria for optimal assessment and treatment decisions tailored to the needs of clients.

PSYC 835 Advanced Clinical Seminar II: Adult
Prerequisite: PSYC 834.
The seminar provides an advanced analysis of issues in the assessment and treatment of behaviour disorders in adulthood. Prototype cases are presented for illustrative discussion of particular clinical issues, e.g. indicators of risk for suicide, homicide, and psychosis; imagery and dreams in psychological treatment;

stress-related physical disorders; anxiety-spectrum disorders; treatment for couples, families, and groups. Assessment and treatment approaches to particular disorders are compared with reference to etiological assumptions and levels of inference.

PSYC 836 Advanced Clinical Seminar II: Child

Prerequisite: PSYC 834.

The seminar provides an advanced analysis of issues in the assessment and treatment of behaviour disorders in children in a developmental context. Prototype cases are presented for illustrative discussion of particular clinical issues, e.g. stress-related physical disorders; family therapy; child abuse; age-related symptom expression and variability; non-verbal therapies.

PSYC 837 Advanced Clinical Seminar II: General

Prerequisite: PSYC 834.

This seminar is a blend of issues examined in PSYC 835 and 836 (see above).

PSYC 838 Extramural Practicum II: General

Prerequisite: Psych 708 (or 709 or 710), 711 (or 712 or 713), and permission of the Director of Clinical Training.

This course is a senior extramural practicum, done under qualified supervision in an applied setting approved by the department's practicum committee, e.g. hospitals, clinics, schools, community and rehabilitation centres.

PSYC 839 Extramural Practicum II: Adult

Prerequisite: Psych 708 (or 709 or 710), 711 (or 712 or 713), and permission of the Director of Clinical Training.

This course is a senior extramural practicum with adult clients, done under qualified supervision in an applied setting approved by the department's practicum committee, e.g. hospitals, clinics, schools, community and rehabilitation centres.

PSYC 840 Extramural Practicum II: Child

Prerequisite: Psych 708 (or 709 or 710), 711 (or 712 or 713), and permission of the Director of Clinical Training.

This course is a senior extramural practicum with child clients done under qualified supervision in an applied setting approved by the department's practicum committee, e.g. hospitals, clinics, schools, community and rehabilitation centres.

PSYC 841 Extramural Practicum III: General

This course is a senior extramural practicum, done under qualified supervision in an applied setting approved

by the department's practicum committee, e.g. hospitals, clinics, schools, community and rehabilitation centres.

PSYC 842 Extramural Practicum III: Adult
This course is a senior extramural practicum with adult clients, done under qualified supervision in an applied setting approved by the department's practicum committee, e.g. hospitals, clinics, schools, community and rehabilitation centres.

PSYC 843 Extramural Practicum III: Child
This course is a senior extramural practicum with child clients, done under qualified supervision in an applied setting approved by the department's practicum committee, e.g. hospitals, clinics, schools, community and rehabilitation centres.

PSYC 844 Clinical and Health Research Area Seminar II
This seminar provides the opportunity for faculty and students working in clinical and health psychology to present and discuss their current research.
Subject matter varies from term to term and from year to year. Students may register for this course up to 4 times provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PSYC 844A, PSYC 844B.

PSYC 845 Cognitive Science Area Seminar II
This seminar provides the opportunity for faculty and students working in cognitive science to present and discuss their current research.
Subject matter varies from term to term and from year to year. Students may register for this course up to 4 times provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PSYC 845A, PSYC 845B.

PSYC 846 Human Development Area Seminar II
This seminar provides the opportunity for faculty and students working on human development and developmental processes to present and discuss their current research.
Subject matter varies from term to term and from year to year. Students may register for this course up to 4 times provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PSYC 846A, PSYC 846B.

PSYC 847 Behavioural Neuroscience Area Seminar II
This seminar provides the opportunity for faculty and students working in behavioural neuroscience to present and discuss their current research.
Subject matter varies from term to term and from year to year. Students may register for this course up to 4

times provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. PSYC 847A, PSYC 847B.

PSYC 850 Practicum in Experimental Techniques (3 or 6 credits)
Prerequisite: Permission of the PhD Program Director.
This practicum is designed to give students the opportunity to develop their research skills by such activities as: (a) learning new experimental skills and techniques; (b) developing computer programs for the execution of experiments or the recording or analysis of experimental data; (c) developing new instruments to facilitate research on a problem, and other equivalent activities. Prior to beginning the work, students who elect to take this option submit to their thesis supervisor and to the program director a 3-5 page outline of what they want to do to meet the practicum requirements. Once the practicum is approved, students are responsible for carrying out the activities described in the outline. Students may complete one 6-credit practicum, or may complete up to two 3-credit practica. Changes in the content of the practica are indicated by a letter following the course number. The number of credits is based on the rule that 45 hours of work equals one credit.

PSYC 851 Teaching of Laboratory Techniques
Prerequisite: Permission of PhD Program Director.
This practicum is designed to train students in the teaching of laboratory techniques. Under supervision, the student is responsible for training an apprentice in specialized experimental skills that require extended on-the-job supervision. Suitable topics would include high pressure liquid chromatography, electrophysiological recording, in vivo voltammetry, or computer programming related to a specific experimental application. The number of credits is based on the rule that 45 hours of work equals one credit.

PSYC 880 PhD Comprehensive Examination (non-credit)

PSYC 885 Predoctoral Internship
Prerequisite: PSYC 835 (or 836 or 837), 823 (824 or 825), and permission of the Director of Clinical Training.
The pre-doctoral internship consists of the equivalent of 12 months full-time employment under qualified supervision in an applied setting approved by the department's internship committee. The internship is usually done after completion of course requirements, and after data collection and analysis, and a draft of the doctoral thesis have been completed.

PSYC 890 Research and Thesis (60 credits)

Religion

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Religion Website

Doctor of/Doctorate in Philosophy (Religion)
Master of/Magisteriate in Arts (History and Philosophy of Religion)
Master of/Magisteriate in Arts (Judaic Studies)

Doctor of/Doctorate in Philosophy (Religion)

This degree is offered conjointly with the Département des sciences religieuses of the Université du Québec à Montréal and the Faculté de théologie et de sciences religieuses of the Université Laval. There are five areas of concentration: theories of religion, history of religions, contemporary religious phenomena, Judaic studies, and comparative religion and ethics. A student chooses to register in one of the three universities on the basis of the match between faculty expertise and the student's specialization, and is subject to that university's regulations. Each student is graduated by the university of their registration. The joint degree provides a context for collaboration between the three departments, with some exchange of faculty for teaching and direction. There are two required doctoral seminars one of which is common to students at all three universities in alternate years.

The doctoral program in Religion at Concordia places strong emphasis on a comparative approach. The comparative study of religion incorporates a number of different but related inquiries, including: examination of the inter-relations between religious beliefs and practices; analysis of religions as social and cultural phenomena and of cultures and societies insofar as they have been influenced by religious traditions; study of inter-relations between religions and human values; investigation of religious ethics; as well as analysis of social issues from the perspective of religious values. These studies are comparative insofar as particular expressions of religions and ethics are viewed as unique but historically situated realities which often can best be understood by making formal or informal comparisons with other comparable realities.

Although the requirements are fundamentally the same in all three universities, the remainder of this section applies only to students registered at Concordia.

Admission Requirements. A Master of Arts in Religion, or equivalent, with high standing from a recognized university.

The Department will consider the application of students to the PhD program for entry without completion of the master's degree if the following requirements are met:

- the student has completed 18 credits of graduate level course work in Religion with high standing;
- the student is recommended by full-time members of the faculty of the Department of Religion;
- the student has acquired a breadth of knowledge in the study of Religion through course work or scholarly or professional experience;
- the student has demonstrated her or his ability to do independent graduate-level research in religious studies, and has demonstrated the ability to produce an original analysis of her/his research (in the form of research papers, conference papers, or publications);
- the student has a well-formed and focused research plan that will serve as a basis for her/his doctoral research.

Transfer Credits. See Transfer Credits in Graduate Admissions section.

Proficiency in English. Any student applying from outside Canada whose first language is not English must demonstrate proficiency in the English language by writing the Test of English as a Foreign Language administered by the Educational Testing Service. Information and applications to write the test may be obtained by writing to: Test of English as a Foreign Language, Educational Testing Service, Princeton, New Jersey, 08540, U.S.A.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 90 credits.
- **Residence.** The minimum period of residence is two years (6 terms) of full-time graduate study beyond the master's degree, or the equivalent in part time study, or three years (9 terms) of full-time graduate study beyond the bachelor's degree.
- **Doctoral Seminars.** All candidates must register for RELI 890 (6 credits) in their first or second or equivalent year of study. This seminar will deal with general and methodological issues in the study of religion. It will be held in common with UQAM and Université Laval; discussion and readings will be both in English and in French. In the first or second or equivalent year of the program, the student will register as well for one of the following seminars according to their specialization: RELI 891, Comparative Religion and Ethics (6 credits), or RELI 892, Judaic Studies (6 credits).
- **Courses.** A student is required to register for a minimum of 18 credits of directed reading. These courses are offered according to the resources of the department and the needs of the students. They are grouped into RELI 800-818 (Topics in Judaic Studies) and RELI 820-839 (Topics in

Comparative Religion and Ethics). Some of the courses at the Master of Arts level are open to PhD candidates, with the requirement of additional work and higher standards of performance.

- **Comprehensive Examination.** Graduate students in Religion at the doctoral level are expected to pursue a program of independent study and research in their chosen field. After course work is completed, all candidates must take RELI 860: Doctoral Comprehensive Examination (15 credits). The comprehensive examination will consist of three written exams followed by an oral examination which reviews these exams. In most cases, two of these written exams focus on topics from two distinct religious traditions; the third written exam will be on a topic related to a student's proposed thesis. One of the three exams should include a focus on theory and methodology. Credits are not distributed among these four examinations. For purposes of registration, this work will be designated as RELI 860 and is graded as pass/fail.
- **Thesis.** Each candidate will prepare a doctoral thesis which is to be an original contribution to scholarship. Although the topic should be provisionally chosen and serve as a coordinating factor throughout the student's doctoral program, a written proposal must be formally submitted and approved by the Graduate Studies Committee after the successful completion of the comprehensive examination. For purposes of registration, the thesis will be designated as RELI 870: Doctoral Thesis (45 credits).
- **Language Requirement.** Students must achieve an acceptable command of the classical and/or modern languages appropriate to their area of specialization. Specific requirements in terms of numbers of years of study and examinations or other demonstrations of competence are established in consultation with the Graduate Program Director and the thesis supervisor. Students are also expected to be proficient in the language or languages of the primary sources relevant to their thesis research. All Canadian students are required to demonstrate a working knowledge of both English and French.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** A graduate student who receives one grade of "C" will be evaluated by the Departmental Graduate Studies Committee with respect to that student's continuance in the program. Two "C"s will result in automatic withdrawal from the program. See Academic Standing in Academic Regulations section.

- **IP Rule.** Students who accumulate more than one IP (In Progress) notation or one IP that has turned into an F shall not normally be permitted to register for courses until the outstanding work is completed.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. See Academic Standing in Academic Regulations section.
- **Time Limit.** The limit to complete the doctoral program is six years (18 terms) of full-time study or eight years (24 terms) of part-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have satisfied all degree requirements and have a cumulative GPA of at least 3.00.

Courses

Since the topics of elective courses are subject to modification according to student enrolment and demands, no course list is provided in this calendar.

Master of/Magisteriate in Arts (History and Philosophy of Religion)

Admission Requirements. An undergraduate degree in religious studies or Judaic studies, or its equivalent. Qualified applicants requiring prerequisite courses may be required to take up to 12 undergraduate credits in addition to and as a part of the regular graduate program. Applicants with deficiencies in their undergraduate preparation may be required to take a qualifying program. Qualifying program students in the Department of Religion must complete their program with a minimum GPA of 3.50 with no courses graded lower than a “B” to be considered for admission to the graduate program. Qualifying students must reapply to the MA program on completion of their qualifying program.

Transfer Credits. See Transfer Credits in Graduate Admissions section.

Proficiency in English. Any student applying from outside Canada whose first language is not English must demonstrate proficiency in the English language by writing the Test of English as a Foreign Language administered by the Educational Testing Service. Information and applications to write the test may be obtained by writing to: Test of English as a Foreign Language, Educational Testing Service, Princeton, New Jersey, 08540, U.S.A.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time graduate study, or the equivalent in part-time study.

- **Program Options.** All students enter in option B (course-intensive, without thesis) and later have the opportunity to apply for option A (with thesis).

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** A graduate student who receives one grade of "C" will be evaluated by the Departmental Graduate Studies Committee with respect to that student's continuance in the program. Two "C"s will result in automatic withdrawal from the program. See Academic Standing in Academic Regulations section.
- **IP Rule.** Students who accumulate more than one IP (In Progress) notation or one IP that has turned into an F shall not normally be permitted to register for courses until outstanding work is completed.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. See Academic Standing in Academic Regulations section.
- **Time Limits.** The time limit to complete the MA in History and Philosophy of Religion for full-time students is 4 years (12 terms) from the time of initial registration in the program or 5 years (15 terms) for part-time students.
- **Graduation Requirement.** In order to graduate, students must have satisfied all degree requirements and have a cumulative GPA of 3.00.

Master of/Magisteriate in Arts (History and Philosophy of Religion) with Thesis (Option A)

Candidates are required to take the following:

- **Core Courses.** RELI 609: Theories of Religion (3 credits); and RELI 610: Methodological Problems in the Study of Religion (3 credits).
- **Elective Courses.** Five other 3-credit courses (15 credits), normally including three courses in another religious tradition.
- **Thesis Proposal.** RELI 655: (3 credits). Students must submit a thesis proposal on a topic chosen in consultation with the thesis supervisor and the proposal must be approved by the Department's Graduate Studies Committee.
- **Thesis.** RELI 600: (21 credits). Students who wish to transfer to the thesis option should have a 3.50 GPA or higher. Once the Thesis Proposal (RELI 655) is approved the student will be transferred from

option B - without thesis to option A - with thesis. Each thesis shall be read and evaluated by the student's thesis supervisor and by two other scholars, one of whom may be an outside examiner.

- **Language Requirement.** Students are expected to acquire knowledge of the classical and/or modern languages appropriate to their area of specialization. Specific requirements will be established in consultation with the Graduate Program Director. Students who intend to pursue graduate studies at the PhD level are also encouraged to gain proficiency in the language or languages of the primary sources relevant to their proposed research.

Master of/Magisteriate in Arts (History and Philosophy of Religion) without Thesis (Option B)

Candidates are required to take the following:

- **Core Courses.** RELI 609: Theories of Religion (3 credits); and RELI 610: Methodological Problems in the Study of Religion (3 credits).
- **Elective Courses.** Ten other 3-credit courses (30 credits), normally including four courses in another religious tradition.
- **Guided Research Paper.** RELI 603 (9 credits) involves the preparation of a substantial research paper.
- **Language Requirement.** Students are expected to acquire knowledge of the classical and/or modern languages appropriate to their area of specialization. Specific requirements will be established in consultation with the Graduate Program Director. Students who intend to pursue graduate studies at the PhD level are also encouraged to gain proficiency in the language or languages of the primary sources relevant to their proposed research.

Courses for the Master of/Magisteriate in Arts (History and Philosophy of Religion)

Candidates for the Master of Arts in the History and Philosophy of Religion may select courses from the course category listings below, as well as those offered by the Master of Arts program in Judaic Studies, which are listed in the next section. Courses are selected in consultation with the Graduate Program Director.

No graduate student may take more than two 3-credit courses or one 6-credit course outside the Department. Permission to substitute outside courses must be granted before taking the course by both the Graduate Program Director in the History and Philosophy of Religion program and by the other Department involved.

All of the general course categories listed below are for one-term, 3-credit courses unless otherwise indicated. A list designating which specific courses are to be offered in any given year, with description of content is available from the Graduate Program Assistant, and on the Department website

Topics in World Religions

Courses offered in recent years include: Islam in North America; Survey of Islamic literature; The Systems of Yoga; Advaita Philosophy of Sankara; Social History of Indian Religions; Women and Buddhism; Hindu Myth and Myth Theory; Buddhist Cosmologies; Power and the Body in Hindu and Buddhist Tantra; Tibetan Religions; and Religions of Iran.

RELI 608 Studies in the History of Religions
RELI 611 Concepts in the Historical Study of Judaism
RELI 612 History of Islamic Thought and Institutions
RELI 613 Modern Islamic Thought and Institutions
RELI 614 History of Hindu Thought and Institutions
RELI 615 Modern Hindu Thought and Institutions
RELI 616 History of Buddhist Thought and Institutions
RELI 617 Modern Buddhist Thought and Institutions
RELI 618 Studies in World Religions and Problems in Modernization in the Middle East and Asia
RELI 619 Reading Course in World Religions
RELI 620 Studies in Iranian Religions

Topics in Religious and Philosophical Thought

Courses offered in recent years include: Religious Wars, Violence, and Sacrifice; Religion and Postmodernism; Jewish and Christian Responses to the Holocaust; Faith and Reason in Medieval Judaism, Islam, and Christianity; Abrahamic Faiths; and Theories of Sacrifice.

RELI 621 Selected Readings in Modern Religious Thought
RELI 623 Selected Readings in Contemporary Religious Thought
RELI 626 Religious Language
RELI 627 Mysticism
RELI 628 Faith and Reason in Religion
RELI 629 Reading Course in Religious and Philosophical Thought

Topics in Religion and Society

Courses offered in recent years include: Love, Sex and Marriage in Judaism; Daoism and Chinese Popular Religion; Heresy and the Formation of Christian Tradition and Justice; Ethics and Religion in a Secular Culture; Gnosticism; and Christian Reformation.

RELI 630 Theoretical Problems in Religion and Culture
RELI 632 Comparative Ethics I
RELI 633 Comparative Ethics II
RELI 636 Religion and Images of Man in Contemporary Cultures
RELI 637 Christianity and Society-Ancient and Medieval Periods
RELI 638 Christianity and Society-Reformation and Modern Periods
RELI 639 Reading Course in Religion and Society

Topics in Christian Studies

Courses offered in recent years include: History of Popular and Official Christianity; Body and Soul - Questions of Dualism; Diversity in Early Christianity; History of Women and Christianity; and From Toleration to Political and Social Activism.

RELI 640 Biblical Studies
RELI 641 History of Christian Thought
RELI 643 Contemporary Catholic Thought
RELI 644 Protestantism
RELI 646 Christian Ethics
RELI 647 Orthodox Christianity
RELI 649 Reading Course in Christianity

Topics in Judaic Studies

See listings for Master of/Magisteriate in Arts (Judaic Studies) below.

Thesis, Research Paper, Thesis Proposal, Methodology

RELI 600 Master's Thesis in History and Philosophy of Religion (21 credits)
RELI 603 Research Paper (9 credits)
RELI 609 Theories of Religion (3 credits)
RELI 610 Methodological Problems in the Study of Religion (3 credits)
RELI 655 Master's Thesis Proposal (3 credits)

Master of/Magisteriate in Arts (Judaic Studies)

Admission Requirements. An undergraduate degree in Judaic Studies or its equivalent, including courses corresponding to RELI 301 (The Hebrew Bible), RELI 326 (Ancient Judaism), RELI 327 (Medieval Jewish Thought and Institutions), RELI 328 (Modern Jewish Thought and Institutions). Qualified applicants requiring prerequisite courses may be required to take up to 12 undergraduate credits in addition to and as a part of

the regular graduate program. Applicants with deficiencies in their undergraduate preparation may be required to take a qualifying program. Qualifying program students in the Department of Religion must complete their program with a minimum GPA of 3.50 with no courses graded lower than a "B" to be considered for admission to the graduate program.
Candidates must demonstrate proficiency in the reading of Hebrew by taking an examination.

Transfer Credits. See Transfer Credits in Graduate Admissions section.

Proficiency in English. Any student applying from outside Canada whose first language is not English must demonstrate proficiency in the English language by writing the Test of English as a Foreign Language administered by the Educational Testing Service. Information and applications to write the test may be obtained by writing to: Test of English as a Foreign Language, Educational Testing Service, Princeton, New Jersey, 08540, U.S.A.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is 3 terms of full-time study, or the equivalent in part-time study.
- **Program Options.** All students enter in course option B (course intensive, without thesis), and later have the opportunity to apply for option A (with thesis).

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** A graduate student who receives one grade of "C" will be evaluated by the Departmental Graduate Studies Committee with respect to that student's continuance in the program. Two "C"s will result in automatic withdrawal from the program. See Academic Standing in Academic Regulations section.
- **IP Rule.** Students who accumulate more than one IP (In Progress) notation or one IP that has turned into an F shall not normally be permitted to register for courses until outstanding work is completed.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. See Academic Standing in Academic Regulations section.

- **Time Limits.** The time limit to complete the MA in Judaic Studies for full-time students is 4 years (12 terms) from the time of initial registration in the program or 5 years (15 terms) for part-time students.
- **Graduation Requirement.** In order to graduate, students must have satisfied all degree requirements and have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts (Judaic Studies) with Thesis (Option A)

- **Core Courses.** RELI 610 (3 credits), and RELI 609 (3 credits) or RELI 611 (3 credits)
- **Elective Courses.** Five other 3-credit courses, which may include one course in another religious tradition (15 credits).
- **Thesis Proposal.** RELI 655 (3 credits). Students must submit a thesis proposal on a topic chosen in consultation with the thesis supervisor and the proposal must be approved by the Department's Graduate Studies Committee.
- **Thesis.** RELI 602 (21 credits). Students who wish to transfer to the thesis option should have a 3.50 GPA or higher. Once the Thesis Proposal is approved the student will be transferred from option B without thesis to option A with thesis. Each thesis shall be read and evaluated by the student's thesis supervisor and by two other scholars, one of whom may be an outside examiner.
- **Language Requirement.** Students are expected to acquire knowledge of Hebrew as a condition for admission to the program. In addition, if the candidates' research necessitates knowledge of another classical or modern language, the Graduate Studies Committee may require proficiency in that language. Specific requirements will be established in consultation with the Graduate Program Director. Students who intend to pursue graduate studies at the PhD level are especially encouraged to gain proficiency in the language or languages of the primary sources relevant to their proposed research.

Master of/Magisteriate in Arts (Judaic Studies) without Thesis (Option B)

- **Core Courses:** RELI 610 (3 credits), and RELI 609 (3 credits) or RELI 611 (3 credits).
- **Elective Courses.** Ten other 3-credit courses, including at least one course in another religious tradition (30 credits).
- **Guided Research Paper:** RELI 603 (9 credits) involves the preparation of a substantial research paper.
- **Language Requirement.** Students are expected to acquire knowledge of Hebrew as a condition for admission to the program. In addition, if the candidates' research necessitates knowledge of another classical or modern language, the Graduate Studies Committee may require proficiency in that language. Specific requirements will be established in consultation with the Graduate Program Director. Students who intend to pursue graduate studies at the PhD level are especially encouraged

to gain proficiency in the language or languages of the primary sources relevant to their proposed research.

Courses for the Master of/Magisteriate in Arts (Judaic Studies)

Candidates for the Master of Arts in Judaic Studies may select courses from the general course categories listed below, as well as those offered by the Master of Arts program in History and Philosophy of Religion, which are listed in the previous section. Courses are selected in consultation with the Graduate Program Director.

No graduate student may take more than two 3-credit courses or one 6-credit course from those offered outside the Department. Permission to substitute outside courses must be granted by both the Graduate Program Director in the Judaic Studies program and by the other Department involved.

All of the general course categories listed below are for one-term, 3-credit courses unless otherwise indicated. A list designating which specific courses are to be offered in any given year, with description of content is available from the Graduate Program Assistant, and on the Department website

RELI 611 Concepts in the Historical Study of Judaism

Other graduate courses offered by the Judaic Studies program fall into the following categories:

RELI 650-659 Topics in Hebrew Bible and Ancient Near Eastern Studies
RELI 660-669 Topics in Rabbinic Judaism
RELI 670-679 Judaism in Late Antiquity
RELI 680-689 Topics in Medieval Judaism
RELI 690-699 Topics in Modern Judaism

Topics in Hebrew Bible and Ancient Near Eastern Studies

Courses offered in recent years include: Women in the Hebrew Bible and The Book of Judges.

RELI 650 Hebrew Bible I
RELI 651 Hebrew Bible II
RELI 655 Ancient Near Eastern Studies I
RELI 656 Ancient Near Eastern Studies II
RELI 659 Reading Course in Ancient Near Eastern Studies

Topics in Rabbinic Judaism

Courses offered in recent years include: Judaic Law-Gender Issues and Early Rabbinic Texts.

RELI 664 Tannaitic Literature
RELI 665 Midrash
RELI 666 Talmud
RELI 669 Reading Course in Rabbinic Judaism

Topics in Judaism in Late Antiquity

Courses offered in recent years include: Midrash and Talmudic Mysticism.

RELI 670 Judaism in Late Antiquity
RELI 677 Hellenistic Literature
RELI 679 Reading Course in Judaism in Late Antiquity

Topics in Medieval Judaism

Courses offered in recent years include: Jewish Law and Ethics and Jews and Christians in the Middle Ages.

RELI 680 Medieval Jewish History I
RELI 685 Medieval Jewish History II
RELI 686 Medieval Jewish Thought I
RELI 687 Medieval Jewish Thought II
RELI 688 Jewish Mysticism
RELI 689 Reading Course in Medieval Judaism

Topics in Modern Judaism

Courses offered in recent years include: Judaism and Pluralism; Religion and State in Israel; Impact of the Holocaust on Religious Thought; and Gender Issues in Modern Jewish History.

RELI 694 Modern Jewish Thought I
RELI 695 Modern Jewish Thought II
RELI 696 Modern Jewish Thought III
RELI 697 Modern Jewish History I
RELI 698 Modern Jewish History II
RELI 699 Reading Course in Modern Judaism

Topics in the History and Philosophy of Religion (Especially relevant to the program in Judaic Studies)

RELI 628 Faith and Reason in Religion
RELI 641 History of Christian Thought

Thesis, Research Paper, Thesis Proposal, Methodology

RELI 602 Master's Thesis (Judaic Studies) (21 credits)
RELI 603 Research Paper (9 credits)
RELI 609 Theories of Religion (3 credits)
RELI 610 Methodological Problems in the Study of Religion (3 credits)
RELI 655 Master's Thesis Proposal (3 credits)

School of Community and Public Affairs

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School of Community and Public Affairs Website

Diploma in Community Economic Development (CED)
Diplôme en développement économique communautaire (DEC)

Diploma in Community Economic Development (CED)

Admission Requirements. To be admitted into the program, applicants will generally be expected to have completed an undergraduate degree with a GPA of 2.70 and must be able to read, write, and express themselves in either English or French.

Each applicant's background, practical experience and learning goals will be fully considered. Applicants are required to submit a two-to-four page personal statement in which they outline their particular field(s) of interest, their strengths and weaknesses, what they expect or hope from their studies, how these expectations tie into their personal or professional goals, and what they expect to contribute to a better understanding of CED.

The Graduate Diploma Program in CED will comply with all other admission criteria established by the School of Graduate Studies.

Residence Requirements. Courses are offered during an extended weekend once a month over the three consecutive terms of the program. A half-time option is also available.

Requirements for the Diploma

To obtain the Graduate Diploma in CED, students will have to obtain a minimum of 30 course credits and a minimum GPA of 2.70. Courses offered by the program are divided between required core courses, open sessions, a project, as well as elective courses. A typical progression through the program takes one year (three semesters):

- Fall Semester: three required courses (9 credits) and one open session (1 credit);

- Winter Semester: two required courses (6 credits), first four months of the student's project course (3 credits), and one open session (1 credit);
- Summer Semester: two elective courses from the areas of concentration (6 credits)*, the last four months of the student's project course (3 credits), and one open session (1 credit).

* Students may take either two courses (Part I and Part II) in a single area of concentration, or one course (Part I) in two areas of concentration, subject to available resources. (All Part II courses require successful completion of Part I in the same area of concentration).

To remain in good academic standing, students have to maintain a minimum GPA of 2.70.

Language of Courses

Students are required to have an excellent knowledge of written and spoken English or French. This program alternates annually between English (years 2010, 2012...) and French (years 2011, 2013...). Students must be able to express themselves in the language in which courses are offered. They can submit written work in either language.

Courses

Required Core Courses

SCPA 501 Introduction to Community Economic Development (3 credits)
This course provides an overview of CED. It traces the historical and intellectual roots of CED as well as critically situates CED in the context of theories of community, local and regional development. Students are provided with basic tools of macro-economic analysis and policy evaluation as it relates to the practice of CED. This course focuses on the institutional environment in which CED initiatives operate to identify the potential and the limitations of local, community-based development strategies. Special focus is given to the perspectives of CED arising out of the feminist movement, cultural communities, Aboriginal communities, the popular sector and other social change movements.

SCPA 502 Comparative Approaches and Models in CED (3 credits)
This course focuses on the objectives of CED by examining the various strategies and diversity of models of CED practices in Quebec, as well as many found elsewhere in Canada, the United States, in Europe and in southern hemispheric countries. The differences in organizational structures and empowerment processes, as well as their social, cultural and economic context is studied and evaluated, mainly through case studies of selected communities.

SCPA 503 Fundamental Skills for CED Practice (3 credits)
This course focuses on helping students acquire a working knowledge of the practical skills required for

building community economic capacity. This includes developing tools to map the material, environmental and human resources within communities. This course assists students in designing socio-economic indicators and a framework for evaluation of CED initiatives and strategic planning. Students are encouraged to identify, as soon as possible, how the use of such skills can be incorporated into either a CED project or an internship within a CED initiative.

SCPA 504 Community Organizing and CED (3 credits)
This course focuses on helping students acquire a working knowledge of the practical skills required in community organizing and capacity building for individual and community empowerment within a CED context. The course explores the role of popular education in community mobilization and collective action, and delves into the strategies, tactics and techniques of community intervention.

SCPA 505 Social Enterprise Development and Social Entrepreneurship (3 credits)
This course provides a framework for business development within a CED perspective. Basic tools for enterprise development, including comprehensive business planning, data evaluation, financial analysis, and forecasting are to be integrated into a social and ethical framework to maintain the democratic objectives of CED. Students develop skills in evaluating a successful commercial venture within the context of these larger objectives.

Project

SCPA 510 CED Field Project - Part I (3 credits)
SCPA 510 structures the Field Project. It introduces students to tools that can be used to design and implement their projects. During this course, students begin to implement their plan with the host organization. Assignments are based on the integration of the tools with the work undertaken in the field project.
Note: This course is part of the requirement that students complete a two-semester field project in some aspect of community economic development. This project is selected and negotiated by the student with a community organization and addresses a particular challenge raised within this setting.

SCPA 511 CED Field Project - Part II (3 credits)
Prerequisite: SCPA 510.
Students continue their field project for a second term within the framework of this course. They build on the practice of the previous term and advance it to reach the objectives established with their host organization. This course aims to strengthen the student's skills in the critical evaluation of practice. Students examine their practice and the reasons for its success, as well as examine strategies for overcoming the barriers they faced. This course offers a framework for the final written report required of students, to be both shared with their host organizations and submitted for the course.

Areas of Concentration: Elective Courses

Areas of concentration are identified according to CED practices in order to help students choose elective courses relevant to their fields of professional specialization or of personal interest. Students will have indicated their priority areas of concentration on their application for admission form.

Up to five areas of concentration are offered, resources permitting, in a given year. The areas are: financing CED initiatives; housing, land use, and urban planning from a CED perspective; communications, technology and CED; international development and CED; Aboriginal CED.
Courses corresponding to these areas of concentration are the following:

SCPA 508 Financing CED Initiatives: Part I (3 credits)
This course examines the roles which can be played by both traditional (banks) and non-traditional (community loan funds) financial institutions in supporting CED initiatives. Special emphasis is placed on exploring alternative financial CED structures. Skills are developed to understand and generate financial planning, as well as investment decisions in traditional and non-traditional enterprises.

SCPA 509 Financing CED Initiatives: Part II (3 credits)
Prerequisite: SCPA 508.
This course uses a case study approach to critically examine and evaluate existing alternative CED initiatives in Canada and the US. This may include on site visits, interviews and occasional guest lecturers.

SCPA 515 Housing and Land Use from a CED Perspective: Part I (3 credits)
This course examines the institutional, economic, political, and environmental factors which affect land policy, and the development of affordable housing. It identifies public and private financial sources and various forms of ownership models including community land trusts and housing cooperatives, among others. Among the skills developed are those related to market analysis and housing needs assessment, site selection and control, and preparing housing projects.

SCPA 516 Housing and Land Use from a CED Perspective: Part II (3 credits)
Prerequisite: SCPA 515.
This course uses a case study approach to critically examine and evaluate existing housing projects, affordable housing and land policy based on a selection of experiences in the U.S. and in Canada. This may include on site visits, interviews and occasional guest lecturers.

SCPA 522 Communications, Technology and CED: Part I (3 credits)
This course explores issues related to information management, analysis and dissemination using different vehicles available including mass media, the Internet, and other new technologies as they emerge. Basic computer literacy is required.

SCPA 523 Communications, Technology and CED: Part II (3 credits)
Prerequisite: SCPA 522.
This course equips practitioners with skills required to share and diffuse CED practices across communities that work in isolation and helps to develop the skills required for communities to use the new technologies and resources necessary for development purposes.

SCPA 529 International Development and CED: Part I (3 credits)
This course explores community-based economic development approaches in countries of the South within their socio-political and historical context. Many economic initiatives in the North have borrowed from these experiences. The course explores the advantages and disadvantages of importing and exporting development models and practices and equips the students with the skills to evaluate the appropriateness of CED models and how to adapt the models, wherever required.

SCPA 530 International Development and CED: Part II (3 credits)
Prerequisite: SCPA 529.
This course explores existing North/South networking and collaboration by identifying non-governmental organizations, community groups and social movements which are working together to develop CED strategies in their respective countries. Discussion is encouraged through class seminars and occasional guest lectures.

SCPA 536 Aboriginal CED: Part I (3 credits)
This course assists participants in exploring specific issues related to Aboriginal community economic development in particular settings (on reserve, urban, rural and northern communities), and addresses challenges common to Aboriginal CED. The course assists participants in exploring historical and contemporary relationships between Aboriginal communities and the predominant cultural and economic forces, and compares traditional Aboriginal organizing and economic practices with the new approaches being proposed by CED.

SCPA 537 Aboriginal CED: Part II (3 credits)
Prerequisite: SCPA 536.
This course uses a case study approach to evaluate one or more community economic development strategies applied within an Aboriginal community. A historical overview of this experience outlines the cultural and political context which has shaped these strategies as well as their results. CED approaches are examined in the context of this individual experience. This course may include on site visits and guest lecturers.

Open Sessions

SCPA 543 A-Z Open Sessions (1 credit each)
The themes and content of the various open sessions are determined at the beginning of each academic year. Three open sessions are offered every year (1 credit each for a total of 3 credits). Possible topics may include: feminist approaches to CED, lobbying decision-making bodies, consensus management, coalition-building, and using the internet for community development purposes - as well as topics related to current events.

Diplôme en développement économique communautaire (DEC)

Conditions d'admission. De façon générale, pour être admis au programme, il faut avoir obtenu au préalable un diplôme universitaire de 1er cycle avec une moyenne générale d'au moins 2.70. Il faut aussi pouvoir lire, écrire et s'exprimer correctement en anglais ou en français.

Les antécédents et les objectifs d'apprentissage de chacun-e des candidat-e-s seront étudiés à fond. Les candidat-e-s doivent soumettre une déclaration personnelle de deux à quatre pages dans laquelle ils/elles décrivent leurs champs d'intérêt spécifiques, leurs forces et leurs faiblesses ce qu'ils/elles espèrent obtenir de leurs études, comment ces attentes sont liées à leurs buts personnels ou professionnels, et en quoi ils/elles comptent contribuer à une meilleure compréhension du DÉC.

Le Diplôme de 2e cycle en DÉC respectera tous les autres critères établis par l'École des études supérieures.

Présence requise. Les cours sont offerts une fois par mois pendant un long week-end durant les trois trimestres consécutifs du programme. L'option à demi-temps est également disponible.

Exigences du programme

Pour obtenir le Diplôme de 2e cycle en DÉC, les étudiant-e-s doivent cumuler un minimum de 30 crédits avec une moyenne générale de 2.70. Les cours du programme sont répartis entre cours obligatoires, cours optionnels, sessions ouvertes, et un projet d'intervention. Un parcours typique se fait en un an (trois trimestres):

- Trimestre d'automne : trois cours obligatoires (9 crédits) et une session ouverte (1 crédit);
- Trimestre d'hiver : deux cours obligatoires (6 crédits), les quatre premiers mois du projet (3 crédits) et une session ouverte (1 crédit);
- Trimestre d'été : deux cours correspondant au champ de spécialisation optionnel (6 crédits)*, les quatre derniers mois du projet (3 crédits) et une session ouverte (1 crédit).

* Les étudiant-e-s peuvent prendre deux cours dans un champ de spécialisation (Partie I et Partie II) ou un cours (Partie I) dans deux champs de spécialisation, selon les ressources disponibles. (Pour s'inscire dans les cours de la Partie II, il faut avoir complété avec succès la Partie I du même champ de spécialisation).

Les étudiant-e-s doivent maintenir une moyenne générale minimum de 2.70 pendant la durée du programme.

Langues d'enseignement

Les étudiant-e-s doivent maîtriser le français ou l'anglais à l'oral comme à l'écrit. Le programme est offert alternativement en anglais et en français. Les cours se donnent en anglais durant l'année inaugurale du programme (automne de l'an 2008), puis en français l'année suivante, et ainsi de suite. Les cours du programme seront donc offerts en français à l'automne de l'an 2011, 2013… Les participant-e-s doivent s'exprimer couramment dans la langue d'enseignement utilisée durant l'année où leur programme se donne. Ils/Elles peuvent soumettre leurs travaux écrits en français ou en anglais.

Cours

Cours obligatoires du tronc commun

SCPA 501 : Introduction au développement économique communautaire (3 crédits)
Ce cours offre une vue d'ensemble du DÉC. Il retrace l'historique et les fondements intellectuels du DÉC et situe le DÉC par rapport aux théories du développement communautaire local et régional. Le cours fournit également aux étudiant-e-s des outils de base pour l'analyse macro-économique et pour l'évaluation des politiques sociales relatives à la pratique du DÉC. Ce cours se concentre sur l'environnement institutionnel dans lequel les initiatives de DÉC opèrent afin d'identifier le potentiel et les limites des stratégies de développement axées sur les communautés locales. Une attention particulière est portée aux perspectives de DÉC émanant du mouvement féministe, des communautés culturelles, des communautés autochtones, du mouvement populaire et d'autres mouvements de changement social.

SCPA 502 : Approches comparatives et modèles de DÉC (3 crédits)
Ce cours se concentre sur les objectifs du DÉC en examinant les diverses stratégies et les différents modèles de pratique de DÉC au Québec, ainsi qu'ailleurs au Canada, aux États-Unis, en Europe et dans les pays de l'hémisphère sud. Des études de cas de communautés sélectionnées sont principalement utilisées afin d'étudier et d'évaluer les différences existant au sein des structures organisationnelles et des processus d'*empowerment,* ainsi que leur contexte social, culturel et économique.

SCPA 503 : Compétences de base en DÉC (3 crédits)
Ce cours aide les étudiants et étudiantes à acquérir une connaissance d'usage des compétences pratiques requises pour bâtir la capacité de prise en charge économique d'une communauté. Ceci comprend l'élaboration d'outils permettant d'inventorier les ressources matérielles, environnementales et humaines au sein d'une communauté. Ce cours aide aussi les étudiants et étudiantes à élaborer des indices socio-économiques ainsi qu'un cadre d'évaluation des initiatives de DÉC et de la planification stratégique. Les

étudiant-e-s sont encouragé-e-s, le plus tôt possible, à identifier comment ils/elles pourront inclure ces compétences dans un projet de DÉC ou un stage à l'intérieur d'une initiative de DÉC.

SCPA 504 : Organisation communautaire et DÉC (3 crédits)
Ce cours permet aux étudiant-e-s d'acquérir une connaissance d'usage des compétences pratiques nécessaires pour maîtriser l'organisation communautaire et pour développer l'*empowerment* des individus et des communautés dans un contexte de DÉC. Ce cours explore le rôle que joue l'éducation populaire dans la mobilisation des communautés et dans l'action collective, et approfondit les tactiques, stratégies et techniques de l'intervention communautaire.

SCPA 505 : Développement d'entreprises sociales et entreprenariat social (3 crédits)
Ce cours propose un cadre de référence pour le développement d'entreprises selon une perspective de DÉC. Des outils de base pour le développement d'entreprises, incluant le développement de plans d'affaires complets, l'évaluation de données, l'analyse financière et l'élaboration de prévisions, seront intégrés dans un cadre social et éthique afin de préserver les objectifs démocratiques du DÉC. Les étudiant-e-s développent les compétences requises afin d'évaluer le succès d'une entreprise commerciale en tenant compte du contexte global de ces objectifs.

Projet

SCPA 510 : Projet en DÉC. Partie I (3 crédits)
En suivant le programme à temps plein, les participant-e-s devront, une fois les trois premiers cours principaux du trimestre d'automne complétés, entreprendre un cours de projet de deux trimestres dans un domaine du développement économique communautaire relié à leur spécialisation ou à champ d'intérêts. Ce projet peut se dérouler au sein du milieu de travail ou de bénévolat du/de la participant-e.

Le projet pratique constitue une occasion pour les participant-e-s de faire face - de manière participative - à un défi particulier qui les passionne et qui est perçu comme important par l'organisme au sein duquel le projet se déroule. Les participant-e-s devront faire appel à leurs forces, leurs expériences passées, et leurs talents, tout en tenant compte de leurs objectifs d'apprentissage. Tous les participantes et participants devront assumer la responsabilité de définir, chercher et négocier leurs projets pratiques par eux-mêmes, avec, bien sur, l'appui du programme de diplôme de 2e cycle en DÉC.

SCPA 511 : Projet DÉC. Partie II (3 crédits)
Préalable : SCPA 510.
Dans la deuxième partie du cours, les participant-e-s analyseront de façon critique leur progrès au sein de leurs projets respectifs, et rédigeront un rapport final résumant et évaluant le projet et les expériences que celui-ci les a amené-e-s à vivre. Ce projet permettra de vérifier les compétences acquises et de valider les

idées et théories apprises dans une situation réelle. Des practicien-ne-s de DÉC sont invité-e-s à participer à l'évaluation des résultats du projet.

Domaines de spécialisation : cours optionnels

Les domaines de spécialisation sont identifiés selon les pratiques de DÉC de façon à aider les étudiant-e-s à choisir des cours optionnels adaptés à leurs spécialités professionnelles ou leurs intérêts personnels; le choix de domaine de spécialisation est spécifié dans la demande d'admission.

Jusqu'à cinq domaines de spécialisation sont offerts chaque année. Les domaines identifiés sont: le financement des initiatives de DÉC; le logement, l'aménagement du territoire et l'urbanisme dans une perspective de DÉC; les communications, la technologie et le DÉC; le développement international et le DÉC; le DÉC en milieu autochtone.

Les cours qui correspondent à ces domaines de spécialisation sont les suivants:

SCPA 508 : Le financement des initiatives de DÉC. Partie I (3 crédits)
Ce cours permet d'étudier les rôles que peuvent jouer les institutions financières traditionnelles (les banques) et non traditionnelles (les associations communautaires de prêt) pour soutenir les initiatives de DÉC. Une attention particulière est portée à l'étude des structures financières alternatives de DÉC. Les compétences requises afin de comprendre et d'initier la planification financière ainsi que la prise de décision quant aux investissements dans les entreprises traditionnelles et non traditionnelles sont également développées.

SCPA 509 : Le financement des initiatives de DÉC. Partie II (3 crédits)
Préalable : SCPA 508.
La seconde partie de ce cours empruntera une approche d'étude de cas pour examiner de façon critique et évaluer des initiatives originales de DÉC au Canada et aux États-Unis. Cela pourrait comprendre la visite de sites, des entrevues et des conférences occasionnelles.

SCPA 515 : Logement et aménagement du territoire dans une perspective de DÉC. Partie I (3 crédits)
Ce cours examine les facteurs institutionnels, économiques, politiques et environnementaux qui influent sur la politique d'aménagement du territoire et la création de logements à prix modique. Il décrit aussi les sources financières publiques et privées ainsi que diverses formes de propriété, y compris les fiducies foncières communautaires et les coopératives de logement. Il permet d'acquérir, entre autres, des compétences en analyse du marché, évaluation des besoins en logement, sélection et contrôle des sites, et préparation de projets domiciliaires.

SCPA 516 : Logement et aménagement du territoire dans une perspective de DÉC. Partie II (3 crédits)
Préalable : SCPA 515.
Ce cours se fonde sur des études de cas américaines et canadiennes afin d'effectuer un examen critique et une évaluation de projets domiciliaires existants, du logement à prix modique et de la politique d'aménagement du territoire. Il pourrait comprendre des visite de sites, des entrevues et des conférences occasionnelles.

SCPA 522 : Communications, technologie et DÉC. Partie I (3 crédits)
Ce cours explore les questions liées à la gestion, à l'analyse et à la diffusion de l'information par différents moyens, y compris les médias de masse, Internet, et les technologies en émergence. Les participant-e-s doivent posséder des connaissances de base en informatique.

SCPA 523 : Communications, technologie et DÉC. Partie II (3 crédits)
Préalable : SCPA 522.
Ce cours dote les praticien-ne-s des compétences nécessaires pour diffuser largement les pratiques de DÉC dans des collectivités qui travaillent souvent dans l'isolement, et pour leur transmettre les compétences dont elles ont besoin afin d'utiliser les nouvelles technologies comme instruments de développement.

SCPA 529 : Développement international et DÉC. Partie I (3 crédits)
Ce cours examine les approches communautaires de développement économique des pays du Sud dans leur contexte socio-politique et historique. De nombreuses initiatives économiques du Nord s'inspirent de ces expériences. Le cours explore aussi les avantages et les désavantages de l'importation et de l'exportation de modèles et de pratiques de développement, et permet d'acquérir les compétences nécessaires pour évaluer l'à-propos de modèles de DÉC et les adapter, au besoin.

SCPA 530 : Développement international et DÉC. Partie II (3 crédits)
Préalable : SCPA 529.
La seconde partie de ce cours explore les réseaux et la collaboration Nord-Sud en identifiant les organismes non gouvernementaux, les groupes communautaires et les mouvements sociaux qui travaillent ensemble pour formuler des stratégies de DÉC dans leur pays respectif. On encourage la discussion par des séminaires et des conférences occasionnelles.

SCPA 536 : Le DÉC en mileu autochtone. Partie I (3 crédits)
Ce cours aide les participant-e-s à étudier des enjeux spécifiques liés au développement économique autochtone, en particulier le contexte (réserve, milieu urbain, rural ou nordique), ainsi qu'à affronter des défis fréquents en DÉC autochtone. Le cours étudie également les rapports historiques et contemporains entre les communautés autochtones et les forces culturelles et économiques prédominantes, et compare les pratiques organisationnelles et économiques traditionnelles avec les nouvelles approches que propose le DÉC.

SCPA 537 : Le DÉC en mileu autochtone. Partie II (3 crédits)
Préalable : SCPA 536.
Ce cours utilise une approche d'étude de cas pour évaluer une ou plusieurs stratégies de développement économique communautaire en contexte autochtone. Un survol historique de cette expérience dessine le contexte qui a façonné ces stratégies autant que leurs résultats. Les approches de DÉC sont examinées dans le contexte de cette expérience particulière. Cela peut comprendre la visite de sites et des conférences occasionnelles.

Sessions ouvertes

SCPA 543 : A - Z Sessions ouvertes (1 crédit chacune)
Les thèmes et contenu des diverses sessions ouvertes sont déterminés au début de chaque année académique. Trois sessions ouvertes sont offertes chaque année (1 crédit chacune sur un total de 3 crédits). Voici quelques-uns des sujets possibles : les approches féministes en développement économique communautaire, le lobbying auprès d'instances décisionnelles, la gestion consensuelle, et la formation de coalitions et l'usage d'internet dans un but de développement communautaire - de même que des sujets liés à l'actualité.

Sociology and Anthropology

- Back to Original Version

Sociology and Anthropology Website

Doctor of/Doctorate in Philosophy (Social and Cultural Analysis)
Master of/Magisteriate in Arts (Social and Cultural Anthropology)
Master of/Magisteriate in Arts (Sociology)

Doctor of/Doctorate in Philosophy (Social and Cultural Analysis)

Admission Requirements. The normal requirement for admission to the PhD in Social and Cultural Analysis is a Master of/Magisteriate in Arts in sociology or in anthropology, with a minimum cumulative GPA of 3.00, from a recognized university. A superior academic record and strong references are both essential. The intended area of research is also a factor as admission is contingent on the availability of an appropriate research supervisor. Applicants who do not have the required background in either one of the disciplines will be required to take courses (undergraduate or graduate) before being admitted into the program. The number of credits required will vary depending on the student's personal background but will be limited to no more than 24 credits.

Any student applying from outside Canada whose first language is other than English must demonstrate proficiency in the English language by writing the TOEFL iBT and obtaining a minimum score of 90 (or 577 for TOEFL PBT).

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 90 credits.
- **Residence Requirements.** The minimum period of residence is two calendar years (6 terms) of full-time graduate study beyond the Master's degree or the equivalent in part-time study.
- **Required Courses** (12 credits). Students are required to take SOAN 800 (6 credits), 820 (3 credits) and 840 (3 credits).
- **Elective Courses** (6 credits). Students may choose two 3-credit courses from the list below.

  Note: Doctoral students will be asked to perform at a higher level as leaders in class discussions and will be given more in-depth work in the form of papers and oral presentations.

Anthropology

ANTH 600 Identity and Difference
ANTH 601 World Anthropologies
ANTH 610 Ethnographic Research and Ethics
ANTH 620 Writing Methods in Inter-Cultural Communication
ANTH 630 New Directions in Anthropological Research
ANTH 640 Special Topics I *
ANTH 641 Special Topics II *

Sociology

SOCI 602 Issues in Classical Sociological Theory
SOCI 603 Issues in Contemporary Sociological Theory
SOCI 612 Designing Sociological Research
SOCI 613 Techniques of Sociological Research
SOCI 620 Population and Society
SOCI 622 Studies in Race and Ethnicity
SOCI 625 Sociology of Culture
SOCI 626 North American Societies
SOCI 627 Social Movements and Social Change
SOCI 632 Sociology of the Family
SOCI 633 Sociology of Knowledge
SOCI 635 Gender Studies
SOCI 637 Development
SOCI 638 The City
SOCI 639 Social Problems
SOCI 640 Community Studies
SOCI 642 Studies in Governance
SOCI 644 Sociology of the Body
SOCI 645 Sociology of Men
SOCI 646 Globalization
SOCI 647 Democracy and Citizenship
SOCI 648 Health, Illness and Medicine
SOCI 649 Media and Communication
SOCI 652 Self and Subjectivity
SOCI 653 Intellectual Biography

- **Comprehensive Examinations (12 credits).** All candidates are required to write two 6-credit comprehensive exams (SOAN 850 and 860). The topics for these exams are set at the end of the first year and the exams completed within the second year of the program. Each comprehensive exam is assessed by a committee of three faculty members drawn from the two disciplines, and formed in consultation with the Graduate Program Director.
- **Thesis Proposal (3 credits).** A candidate who has passed the comprehensive examinations must then submit a thesis proposal to the Graduate Program Director and the thesis committee (selected in consultation with the GPD). This proposal will be explained to, and defended before the thesis committee. If accepted, this constitutes the completion of SOAN 870 (3 credits).
- **Thesis (57 credits).** The candidate who has passed the PhD comprehensive examinations and the thesis proposal will proceed to the final requirement. The thesis is expected to make an original contribution to knowledge, to be based on primary sources and to be presented in an acceptable literary form. The thesis will demonstrate knowledge of theories and methods associated with each discipline. The thesis will normally be no more than 400 pages in length in total. Subject to the approval of the GPD and the thesis committee, a component of the thesis can take the form of a film or CD Rom.
- **Language Requirement.** Given that the bulk of the literature in the two disciplines is written in English and French, reading assignments are given in both languages. Students are required to work towards reading proficiency very quickly. Upon completion of their coursework, students are required to demonstrate reading proficiency in both languages before being permitted to begin the thesis portion of their program. The proficiency level is verified through the administration of a translation test at the end of the coursework period.
  In addition, students whose research topic requires the knowledge of a third language will be expected to take the necessary courses and demonstrate proficiency in that language before embarking on their research.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a minimum cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students who obtain a grade of C in a course are required to repeat the course or take another course. Students receiving more than one C grade will be withdrawn from the program.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies are withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission are withdrawn from the program without any further possibility of re-admission.

- **Time Limits.** All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Required Courses

SOAN 800 General Seminar (6 credits)
This course focuses on orientating the common epistemological interests of sociological and anthropological approaches to social and cultural analysis in the four areas of specialization. In order to maximize interdisciplinary coverage, the seminar will be led by two faculty members, one trained in sociology and one in anthropology.

SOAN 820 Professional Development
This course is designed as a seminar in which guest speakers orally present the results of their work and practical information on various professional skills (professionalization). Students are exposed to a variety of research conducted in the two disciplines and acquire communication and teaching skills necessary for working in the real world (defined as both academic and non-academic). Students learn how to present research results to a variety of audiences, how to address issues related to university teaching, and how to deal with ethical issues in the research context. The course is graded as Pass/Fail. It is mandatory for all students in the program. Each week, students must submit a written report on the presentation of the previous week.

SOAN 840 General Seminar
Designed as a preparation to the research involved in the thesis, the second general seminar focuses on the development of writing and research capacities, preparing research proposals, addressing issues in theory and method in relation to various topics, covering literature reviews. One faculty member is responsible for this seminar.

SOAN 850 Comprehensive Exam I (6 credits)
SOAN 860 Comprehensive Exam II (6 credits)

Towards the end of their 1st year in the program, and in consultation with the Graduate Program Director, PhD students will form an advisory committee of three faculty members, including their thesis supervisor, to assist in the preparation of the comprehensive exams (6 credits each). A core reading list of 50 to 100 titles is suggested as reasonable for each of the exams. The first comprehensive exam is non-related to the thesis topic while the second is broadly connected to it (but not so closely as to be a potential chapter of the thesis). In both cases, the ultimate goal of the exams is to establish a future faculty member's academic

specialization. After completing them, the student should have acquired sufficient background to teach a course and/or conduct advanced research in the area.

The examinations normally take place before the end of the student's second year in the program. Each exam takes the form of a written essay (20-25 pages) that the student has three weeks to write. The submission of the written examination is followed in the next three weeks by an oral defense before the advisory committee. Students who fail one of these exams are allowed to take it for a second time during the following term. A second failure leads to the students' withdrawal from the program.

SOAN 870 Thesis Proposal
A candidate who has successfully completed the course requirements and the comprehensive exams must submit a thesis proposal to the Graduate Program Director and the thesis committee. The thesis committee, selected in consultation with the GPD, is composed of three members representing both Sociology and Anthropology. It may be the student's initial advisory committee. The thesis proposal should describe the topic of the thesis, situate it in the relevant literature, and discuss the intended research methods. The written version of the proposal is approved by the members of the thesis committee and followed by an oral defense before the committee members. Following this, the PhD candidate will be invited to present his thesis proposal in a departmental seminar.

SOAN 890 Thesis (57 credits)
Doctoral candidates submit a thesis based on their research and defend it in an oral examination. The thesis is expected to make an original contribution to knowledge, to be based on primary sources and to be presented in an acceptable form. The thesis should normally be no more than 400 pages in length (or equivalent if a non-literary format is used).

Social and Cultural Anthropology

Master of/Magisteriate in Arts (Social and Cultural Anthropology)

Admission Requirements. An undergraduate degree with honours or specialization in anthropology or joint specialization in anthropology and sociology, with a grade point average of 3.00 (B average) is required. An undergraduate degree with a major in anthropology, with a grade point average of 3.00 (B average) will be considered, provided that the background preparation is acceptable.

Applicants who lack certain prerequisite courses may be required to take a qualifying program of up to 12 undergraduate credits in addition to the regular graduate program. For the qualifying program a grade point average of 3.00 (B average) is required.

Applicants with deficiencies in their undergraduate preparation may be required to take up to 24 undergraduate independent credits.

International students must pass the TOEFL iBT language test with a minimum score of 80 (or 550 for TOEFL PBT). Similar scores on comparable tests are acceptable.

Applications to the program must be accompanied by a preliminary statement (roughly 500 words in length) of the student's intentions regarding research, fieldwork and thesis.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits. Additional courses may be taken from outside the program, subject to the advice and approval of the student's supervisor or the Graduate Program Director.
- **Residence.** The minimum residence requirement is one year (3 terms) of full time study, or the equivalent in part-time study.
- **Supervision.** At the beginning of the first term of full-time or part-time study, the student is assigned an interim advisor for the duration of the first term. At the beginning of the second term in the case of full-time study, or the equivalent in terms of part-time study, the student must select a permanent thesis supervisor as well as a second faculty member to serve on the Thesis Committee. Members of the Thesis Committee evaluate the thesis. The thesis will be examined by an Examining Committee, composed of the thesis supervisor and the second committee member, and a third faculty member chosen in consultation with the Graduate Program Director. The responsibility for the composition of the Thesis Committee rests with the student in consultation with and subject to the approval of the Graduate Program Director.
- **Language Requirement.** A working knowledge of English and French is recommended, although written work may be submitted in either language. Where appropriate, students are encouraged to acquire competence in the language of the community they choose to study; this may be achieved in the context of ANTH 640.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative Grade Point Average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students in master's/magisteriate programs are allowed to receive no more than one *C* grade to remain in good standing in the University.

- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limits.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

Each student must satisfactorily complete the following program: ANTH 600, ANTH 601, ANTH 610, ANTH 620, ANTH 630, and ANTH 660. Each student must further complete the fieldwork and thesis component of the degree program, which is composed of ANTH 690, ANTH 691 and ANTH 692.

All courses listed below are worth 3 credits unless otherwise noted.

ANTH 600 Identity and Difference
This course explores the processes of social differentiation and identification.

ANTH 601 World Anthropologies
This course examines the roots of anthropological theory in Western culture and the decolonization of anthropology since the 1960s.

ANTH 610 Ethnographic Research and Ethics
This course explores the methods used to gather ethnographic material and the ethical dynamics of the fieldwork encounter, and the duties of the anthropologist as cultural mediator.

ANTH 620 Writing Methods in Inter-Cultural Communication
This course examines a range of methods and styles for presenting ethnographic material, from ethnographic realism to fiction, and encourages further experimentation.

ANTH 630 New Directions in Anthropological Research
This course explores emergent concepts, methods and topics in anthropology.

ANTH 640 Special Topics I *
This course, selected in consultation with the student's thesis supervisor, may be taken from a cognate discipline.

ANTH 641 Special Topics II *

This course, selected in consultation with the student's thesis supervisor, is offered as the occasion arises, for example, when a faculty member returns from the field, or when a visiting professor is in residence.

ANTH 660 Professional Development Seminar

This seminar is designed to help students develop the professional skills needed to pursue a career in research, practice or teaching. Students are exposed to a variety of research approaches through presentations by a diversity of faculty researchers. This seminar takes place every two weeks over the course of the Fall and Winter semesters. Credit for this course is obtained on a pass/fail basis.

ANTH 690 Thesis Proposal

The student develops a research proposal under the direction of his/her thesis supervisor.

ANTH 691 Fieldwork: Stage (6 credits)

The fieldwork requirement, which may last from 3-4 months, involves undertaking research in a community which differs in important respects from the student's community of reference, and collecting ethnographic data. This research will form the basis of the student's thesis.

ANTH 692 Thesis (18 credits)

The thesis is required to demonstrate that the student has been able to carry out independent field research. It should be a work of near publishable quality. The thesis is evaluated by the student's Thesis Committee and one other faculty member. The student is also required to defend the thesis orally before the above-mentioned examiners.

* Subject matter varies from term to term and from year to year. Students may re-register for this course provided that the course content has changed. Changes in content are indicated by the letter following the course number, e.g. ANTH 640A, ANTH 640B, etc.

Sociology

Master of/Magisteriate in Arts (Sociology)

Admission Requirements. An undergraduate degree with honours or specialization in sociology, with a grade point average of 3.00 (*B* average) is required. An undergraduate degree with a major in sociology, with a grade point average of 3.00 (*B* average) will also be considered provided that the background preparation is acceptable. Applicants with degrees in cognate disciplines with higher grade point averages will also be considered.

Applicants who lack certain prerequisite courses may be required to take a qualifying program of up to 12 undergraduate credits in addition to the regular graduate program. For the qualifying program a grade point average of 3.00 (*B* average) is required.

Applicants with deficiencies in their undergraduate preparation may be required to take up to 24 undergraduate independent credits.

International students must pass the TOEFL iBT language test with a minimum score of 80 (or 550 for TOEFL PBT). Similar scores on comparable tests are acceptable.

Applications to the program must be accompanied by a preliminary statement (roughly 500 words in length) of the student's intentions regarding research and thesis.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits. Additional courses may be taken from outside the program, subject to the advice and approval of the student's supervisor or the Graduate Program Director.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Supervision.** At the beginning of the first term of full-time or part-time study, the student is assigned an interim advisor for the duration of the first term. At the beginning of the second term in the case of full-time study, or the equivalent in terms of part-time study, the student must select a permanent thesis supervisor and a second faculty member to serve on the Thesis Committee. Members of the Thesis Committee evaluate the thesis. The thesis will be examined by an Examining Committee, composed of the thesis supervisor and the second committee member, and a third faculty member chosen in consultation with the Graduate Program Director. The responsibility for the composition of the Thesis Committee rests with the student in consultation with and subject to the approval of the Graduate Program Director.
- **Language Requirement.** A working knowledge of English and French is recommended although written work may be submitted in either language.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

- **C Rule.** Students in master's/magisteriate programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree must be completed within 12 terms (4 years) of full-time study or 15 terms (5 years) of part-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts in Sociology with Thesis (Option A)

Courses. Each student must satisfactorily complete the following program: SOCI 602 (3 credits), SOCI 603 (3 credits), SOCI 612 (3 credits), SOCI 613 (3 credits), SOCI 660 (3 credits), and SOCI 690 (3 credits); a course in the area of research (3 credits); one elective course (3 credits), SOCI 691 (21 credits).

Thesis. Students enrolled in the thesis option are required to demonstrate their ability to carry out independent research which reflects a scientific approach. The thesis proposal, SOCI 690 (prepared within the confines of the thesis tutorial) will serve as the basis for the elaboration of the written thesis, SOCI 691. The student will then orally defend the thesis before an examining committee. The thesis may be written in either English or French.

Master of/Magisteriate in Arts without Thesis (Essay - Option B)

Courses. Each student must satisfactorily complete the following program: SOCI 602 (3 credits), SOCI 603 (3 credits), SOCI 612 (3 credits), SOCI 613 (3 credits), SOCI 660 (3 credits), SOCI 695 (18 credits) and 12 credits of electives.

Essay. SOCI 695 (18 credits): Each student is required to write the essay under the supervision of one faculty member and is evaluated by two faculty members, including the supervisor. It can either be a literature review of a substantive nature, or a report on empirical research. Students are expected to submit work of publishable or near publishable quality. The appropriate length of the essay is approximately 40 pages.

Note 1. All students are required to plan courses related to their own interests with the help of advisors.
Note 2. No more than 6 credits of elective studies taken outside the discipline may be credited towards the degree.

Courses

SOCI 602 Issues in Classical Sociological Theory
This course is designed to examine selected classical texts and analyze the work of recent interpreters and critics. During this course, we will endeavour to develop our critical understanding of the classics. In addition, we will strive to create an awareness of the diversity of readings of classical texts that will enhance our ability to make further critical appropriations, revisions, and uses of the classical tradition. (3 credits)

SOCI 603 Issues in Contemporary Sociological Theory (3 credits)
This course is an in-depth study of issues in contemporary sociological theory. It is designed to foster awareness of the plurality, diversity, and divergence among contemporary readers and readings of current texts. The focus is on critical analysis of major writings representing diverse theoretical orientations in recent sociology. Attention is given to fundamental assumptions and to practical implications of given orientations and styles of sociology.

SOCI 612 Quantitative Research Design and Methods (3 credits)
This course explores quantitative research design and methodology as a whole process, from conceptualization to research questions, methods, data analysis, and results dissemination. Topics include data structures and their relation to theory; data collection; access to and use of large data sets; coding and validity and reliability issues; statistical techniques as generalized linear models; linear and logistic regression. Students apply various methods to read data. Ethical issues are also considered.

SOCI 613 Qualitative Research Design and Methods (3 credits)
This course explores research methodology, design, analysis and dissemination. Topics include focus groups, participant observation, open-ended and structured interviewing, content and discourse analysis, life histories and historical analysis. Analysis will also explore approaches to coding qualitative data and the links between data and conceptual and theoretical categories. Ethical issues as well as issues of researcher safety in the field are considered.

SOCI 660 Professional Development Seminar (3 credits)
This seminar is designed to help students develop the professional skills needed to pursue a career in research, practice or teaching. Students are exposed to a variety of research approaches through presentations by a diversity of faculty researchers. This seminar takes place every two weeks over the course of the Fall and Winter semesters. Grading for this course is obtained on a pass/fail basis.

SOCI 690 Thesis Proposal (3 credits)
The student develops a research proposal under the direction of his/her thesis supervisor.

SOCI 691 Thesis
Students enrolled in the thesis option are required to demonstrate their ability to carry out independent

research which reflects a scientific approach. The thesis proposal, SOCI 690 (prepared within the confines of the thesis tutorial) will serve as the basis for the elaboration of the actual thesis, SOCI 691. This will take the form of a written thesis (21 credits) of at least article length. The student will then orally defend the thesis before an examining committee. The thesis may be written in either English or French.

SOCI 695 Essay
The essay is written under the supervision of one faculty member and is evaluated by two faculty members, including the supervisor. It can either be a literature review of a substantive nature, or a report on empirical research. Students are expected to submit work of publishable or near publishable quality. The appropriate length of the essay is approximately 40 pages.

Selected Topics

The offerings for the following courses will be reviewed each year in light of the interest of students and faculty members. Five elective courses are offered each academic year from the list given below. Courses numbered “700” are advanced studies and normally will be conducted on a tutorial basis. The corresponding 600-level course is a prerequisite to the 700-level course. All courses listed below are worth 3 credits unless otherwise noted.

SOCI 620/720 Population and Society
SOCI 622/722 Studies in Race and Ethnicity
SOCI 625/725 Sociology of Culture
SOCI 626/726 North American Societies
SOCI 627/727 Social Movements and Social Change
SOCI 632/732 Sociology of the Family
SOCI 633/733 Sociology of Knowledge
SOCI 635/735 Gender Studies
SOCI 637/737 Development
SOCI 638/738 The City
SOCI 639/739 Social Problems
SOCI 640/740 Community Studies
SOCI 642/742 Studies in Governance
SOCI 644/744 Sociology of the Body
SOCI 645/745 Sociology of Men
SOCI 646/746 Globalization
SOCI 647/747 Democracy and Citizenship
SOCI 648/748 Health, Illness and Medicine
SOCI 649/749 Media and Communication

SOCI 652/752 Self and Subjectivity
SOCI 653/753 Intellectual Biography

Additional Topics, Thesis, and Essay

SOCI 601 Topics in Advanced Theory
SOCI 611 Topics in Advanced Methodology
SOCI 650/750 Special Topic in Sociology I
SOCI 651/751 Special Topic in Sociology II
SOCI 691 Thesis (21 credits)
SOCI 695 Essay (18 credits)

Theological Studies

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Theology Website

Master of/Magisteriate in Arts (Theological Studies)

Admission Requirements. A solid undergraduate preparation with a range of competence similar to that demanded of Major students at Concordia, and a minimum *B* average in their undergraduate studies. Qualified applicants requiring prerequisite courses may be required to take up to 12 undergraduate credits in addition to and as a part of the regular graduate program. Admission into the program is on recommendation of the Graduate Studies Committee.

Language Requirements. Thesis proposals which depend on special linguistic skills will be accepted only from students competent in the appropriate languages.

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to complete 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time graduate study, or the equivalent in part-time study.
- Students may enter one of the two options, A or B, outlined below.

Academic Regulations

- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students in research master's/magisteriate programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.

- **Time Limit.** All work for a master's/magisteriate degree for full-time students is ideally completed within 6 terms but must not go beyond 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 8 terms and must not go beyond 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Option A: MA with Thesis

Required courses: THEO 603: Method in Theology (3 credits), THEO 604: Seminar in Ecclesiology (3 credits), THEO 685 Reading Course (6 credits).

Electives: 9 credits from THEO 620-675.

Thesis: THEO 695 Thesis Proposal (3 credits); THEO 697 Thesis (21 credits).

Option B: MA with Applied Project in Theology

Required courses: THEO 603: Method in Theology (3 credits), THEO 604: Seminar in Ecclesiology (3 credits)

Electives: 18 credits from THEO 620-675.

Research: THEO 691: Research Paper (12 credits), THEO 692: Applied Project in Theology (9 credits).

Courses

There will be at least 21 credits (7 courses) offered every year by the MA Program in Theological Studies. The required THEO 603 Method in Theology will be offered each year.

The courses offered are one-term, 3-credit courses unless otherwise indicated. A list designating which specific courses are to be offered in any given year, with description of content, will be compiled and distributed prior to registration.

Topic Courses

Topics in Scripture

THEO 621 Old Testament I
THEO 623 Old Testament II
THEO 627 Questions in Old Testament Research

THEO 629 Intertestament Studies
THEO 631 New Testament I
THEO 633 New Testament II
THEO 635 New Testament III
THEO 637 Questions in New Testament Research
THEO 639 Biblical Studies

Topics in Church History

THEO 641 History I
THEO 643 History II
THEO 645 History III
THEO 647 Research in History of Christian Thought
THEO 649 Questions in Christian Worship

Topics in Theology

THEO 651 Theology I
THEO 653 Theology II
THEO 655 Theology III
THEO 657 Questions in Theological Research
THEO 661 Ecclesiology I
THEO 663 Ecclesiology II
THEO 664 Ecclesiology III
THEO 667 Research In Ecclesiology
THEO 669 Theology & World Religions

Topics in Christian Ethics

THEO 671 Ethics I
THEO 673 Ethics II
THEO 675 Issues in Ethical Research

THEO 603 Method in Theology (3 credits)
The objective of this course, to be taken at the beginning of the program, is to give the students both a theoretical and a practical introduction to original research: the experience of seriously choosing a topic and a specific question, and in coming to grips with the reality of identifying the steps to be taken, the information to be collected, and so forth. The course will be the occasion of the student to choose a director

for their theses, practicum, or research papers, and to begin working with a specific research director. This course will serve as the chief instrument for incorporating new students into the program.

THEO 604 Seminar in Ecclesiology (3 credits)
The objective of this seminar, to be taken in the second semester if possible, will be to introduce students to the notion of church as interpretative community, and to experience diverse ways of exploiting this notion. This seminar will also serve to bring students together, and to exchange ideas drawn from their research in diverse theology courses.

THEO 685 Reading Course (6 credits)
The reading course will serve to deepen relevant aspects of the research project in the chosen field of theological studies that normally are not covered by regularly offered courses.

THEO 691 Research Paper (12 credits)
The guided research project involves the preparation of a substantial research paper. It may be prepared in conjunction with any seminar course but will be separate from the basic course requirements.

THEO 692 Applied Project in Theology (9 credits)
The aim of this course is to give the student the opportunity to engage in critical theological reflection by frequenting a milieu where theological interpretation occurs on a regular basis (e.g. a local parish, a confessional school, a religious formation program like the Christian Training Program, religious programming in the media, etc.) in order to assess the theological models presupposed in the activity studied. The practicum will include a 3 credit reading component related to the field of study.

THEO 695 Thesis Proposal (3 credits)
Students taking Option A must submit an extended thesis proposal on a topic chosen in consultation with the thesis supervisor and approved by an advisory committee. It shall consist of a description of the state of research on the topic in question, a statement of the question underlying the thesis project, a formulation of the hypothesis to be tested, and a relevant bibliography.

THEO 697 Thesis (21 credits)
The thesis shall consist in the presentation of the research results. Each thesis shall be examined by a committee consisting of the student's supervisor and by at least two other scholars from the Department. The remaining regulations concerning the thesis examination are in accordance with the School of Graduate Studies (See Thesis Regulations).

Cognate Courses

With permission of the Graduate Program Director up to 6 credits may be chosen from graduate offerings in other Departments at Concordia or other universities. Permission of the graduate director of the respective program must also be granted.

Engineering and Computer Science Programs

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English Language Proficiency

TOEFL/IELTS Admission Requirements

The provisional minimum acceptance score for the Internet-based Test of English as a Foreign Language (TOEFL iBT) for admission into a graduate program for students whose first language is not English and/or who have not received a substantial amount of their education in English is 85, with a minimum of 20 in each section. In all cases, Concordia reserves the right to require proof of English proficiency when such proof is deemed necessary. (Concordia will accept test results for the paper-based TOEFL if they are less than 2 years old). The minimum required score for the paper-based TOEFL is 563. The IELTS (International English Language Testing System) requires a minimum Band score of 6.5. Individual programs may require a higher score. Applicants should check their prospective program's requirements.

In addition to the general admission requirements, the Faculty may require applicants to write the Engineering Writing Test (EWT) as a condition of admission to all graduate programs in Engineering and Computer Science. Depending on the result, students may be required to complete remedial English language courses in addition to their program requirements.

Engineering Writing Test (EWT)

The Engineering Writing Test examines students' ability to provide reasoned assessment of a short technical composition in English or French, and their ability to provide a qualitative account of quantitative or graphically presented data. The test is offered a number of times throughout the year. Based on their performance in the test, students may be asked to take remedial courses.

Academic Regulations

All students registered in a Faculty graduate degree program are assessed at the end of each academic year. This assessment is based on:

- courses for which a grade point value has been assigned subsequent to their admission to their program, or in the case of reinstated students, subsequent to their reinstatement, and
- other degree requirements, for which no grade point value is assigned, such as doctoral seminars, comprehensive examinations, doctoral research proposals and theses which are graded on a pass/fail or equivalent basis.

Standings of students are determined as follows:

- **Good Standing.** Master's program: No failures on record and a weighted cumulative grade point average of at least 3.00 based on a minimum of 12 credits. PhD program: No failures on record, a maximum of one grade below *B* and a weighted cumulative grade point average of at least 3.00 based on a minimum of 8 credits.
- **Failed Standing.** Failure to meet the criteria for good standing.
- **Reinstatement.** Subject to regulation four below, failed students may apply to the Graduate Program Director of the appropriate Department for reinstatement. Where the recommendation is to reinstate, this will be forwarded to the Dean of Graduate Studies for approval. Any special conditions will be specified at the time of reinstatement.
- **Withdrawal.** Failed students who were previously assessed as failed must withdraw from the Faculty degree program.
- **Graduation Requirements.** To be considered for the award of a graduate degree, students must have satisfied all degree requirements and have obtained a weighted grade point average of 3.00 based on all courses credited towards the degree and taken at Concordia subsequent to first registration in the program, and, in the case of PhD students, a maximum of one grade below *B*.

Doctor of/Doctorate in Philosophy

The Doctor of/Doctorate in Philosophy program leads to the highest degree offered by the Faculty and is designed to provide students an opportunity to obtain the greatest possible expertise in their chosen field through intensive research. Advancement of analytical and/or experimental knowledge through a combination of specialized courses and a research thesis under the supervision of an experienced researcher forms the main component of the doctoral programs. Where possible, research of interest to industry is encouraged. The objectives of the PhD program is to educate highly qualified researchers required for the expansion of fundamental knowledge and technological innovation through research and development, as well as the needs of institutions of higher learning.

Admission Requirements. To be considered for admission on a full-time basis, applicants normally must hold a master's degree or equivalent with high standing in engineering or computer science, or in a cognate discipline. Holders of bachelor's degree will, in general, be considered for admission to a master's program

only. After completion of a minimum of two terms of full-time study, they may, upon application, be considered by the Faculty Graduate Studies Committee for admission to a PhD program.

To be considered for admission on a part-time basis, applicants must hold a master's degree with high standing in engineering, computer science or a cognate discipline. Applicants should understand that admission is contingent not only upon a superior academic record, but also on the availability of a research supervisor, of relevant programs of study and research, as well as adequate laboratory and library facilities. Where applicable, an ability to write programs in a standard computer language will be assumed. Students lacking this skill will be required to register for appropriate courses.

Requirements for the Degree

- **Credits.** A fully-qualified candidate entering the doctoral program with a master's degree is required to complete a minimum of 90 credits. A candidate admitted beyond the bachelor's level is required to complete a minimum of 106 credits. Candidates admitted with a master's degree in a cognate discipline, or if they need additional knowledge in an area pertinent to their research, will, in general, be required to complete more than the minimum number of credits. Students may not credit any undergraduate equivalent course towards the requirements of a 90-credit or 106-credit PhD program without the permission of their supervisor and of the Graduate Program Director.
- **Residence.** For candidates admitted with a master's degree, the minimum period of residence is two years of full-time study or the equivalent in part-time study. Part-time students may be required by the Faculty Graduate Studies Committee, upon the recommendation of the supervisory committee, to carry out a portion of their research on a full-time basis. Where a candidate has been admitted with a bachelor's degree, the minimum period of residence is 36 months of full-time study after completion of the bachelor's degree.
- **Transfer Credits.** Students may be granted transfer credit for courses taken in approved graduate studies prior to their entry into their program. A course submitted for transfer credit must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.
- **Courses.** Students admitted on the basis of a master's degree will normally be required to complete a minimum of 12 credits in course work. A student admitted on the basis of a bachelor's degree will normally be required to complete a minimum of 28 credits in course work. Students must also successfully complete the PhD seminar ENCS 8011 (2 credits). Each student's program must be approved by a supervisory committee consisting of three members of faculty, including the student's research supervisor. This supervisory committee will also arrange for the student's comprehensive examination, the presentation of the doctoral research proposal, and thesis evaluation.
- **Comprehensive Examination.** Students must take a comprehensive examination, ENCS 8501, which may be both written and oral. Normally the comprehensive examination is taken when course work

has been completed and within 12 (24) months after the first registration as a full-time (part-time) student in a PhD program. Students will be assessed on the basis of written and oral examinations of fundamentals related to their field of research. The comprehensive examination will normally be administered by a committee (the Comprehensive Examination Committee) consisting of the supervisory committee, at least one member external to the candidate's program and other members appointed at the discretion of the supervisory committee. Students who fail this examination are permitted to take it a second time in the following term. Students failing a second time are withdrawn from the program. Students should consult the program regarding specific examination procedures and requirements.

- **Doctoral Research Proposal.** Upon successful completion of the comprehensive examination, students must pass the doctoral research proposal ENCS 8511 (6 credits), within 18 (36) months after the first registration as a full-time (part-time) student in a PhD program, before they are admitted to candidacy for the PhD degree. Students will be assessed on the basis of written and oral presentations that must include: (i) a critical review of previous work relevant to the subject of the thesis, and (ii) a detailed research plan of action and expected milestones. Students are required to defend their doctoral research proposal before a committee that will normally be comprised of the same members as the Comprehensive Examination Committee. Students must demonstrate the viability of their project and their capacity to undertake doctoral thesis research. The proposal may be accepted, returned for modifications, or rejected. The rejection of a proposal will result in the student's withdrawal from the program. A student whose proposal is accepted will be admitted to candidacy for the PhD.
- **Thesis.** Students are required to plan and carry out a suitable research, development, or design project, which leads to an advance in knowledge. The student must submit a thesis based upon this work and defend it in an oral examination. For purposes of registration, this work will be designated ENGR 8911 or COMP 8901: Doctoral Research and Thesis (70 credits). Theses will be examined by a committee consisting of the student's supervisory committee, an external examiner, and other examiners as approved by the Faculty Graduate Studies Committee and the Dean of Graduate Studies.
- **Cross-Registration.** A student in the program wishing to take courses under the cross-registration scheme must first obtain approval of the Faculty Graduate Studies Committee. (See Inter-University Agreement in Graduate Registration section).
- **Time Limit.** All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of original registration in the program.

Master of/Magisteriate in Applied Science

This program is designed to provide students with an opportunity to strengthen, in some specific area or areas, the knowledge gained at the undergraduate level, and to provide a significant introduction to research. It will appeal primarily to the student interested in full-time study.

Admission Requirements. Applicants to the MASc program should hold a bachelor's degree in engineering or equivalent with high standing. Consideration will also be given to candidates with a degree in a cognate area with high standing; such students may be required to enrol in an extended program. In particular, applicants with a bachelor's degree in architecture will be considered for the MASc in Building Engineering. The Faculty Graduate Studies Committee will determine the acceptability of an applicant for admission to the program and may require an applicant to take specified undergraduate courses in order to qualify for acceptance. Qualified applicants requiring prerequisite courses may be required to take such courses in addition to their regular graduate program. Applicants with deficiencies in their undergraduate preparation may be required to take a qualifying program. An ability to write simple programs in a standard computer language will be assumed. Students lacking this skill will be required to register for a course prescribed by the Graduate Program Director. This course will be taken in addition to regular degree requirements.

Applications. Applications for admission from within Canada must be complete by June 1 for the Fall term, October 1 for the Winter term, and February 1 for the Summer term. Applications from outside Canada must be complete by February 15 for the Fall term, June 15 for the Winter term, and October 15 for the Summer term.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete successfully a minimum of 45 credits. For specific program requirements, refer to the relevant departmental entry in the following pages. Each individual program of study must be approved by the student's department and the Faculty Graduate Studies Committee.
- **Transfer Credits**. Student may be granted transfer academic credits for, in general, not more than eight credits taken in approved graduate studies prior to their entry into this program. A course submitted for transfer credits must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.
- **Cross-Registration**. A student in the program wishing to take courses under the cross-registration scheme must first obtain approval of the Faculty Graduate Studies Committee. (See Inter-University Agreement in Graduate Registration section)
- **Thesis**. Students must complete a 29-credit thesis as part of their degree requirements. The thesis must represent the results of the student's independent work after admission to the program. The proposed topic for the thesis, together with a brief statement outlining the proposed method of treatment, and the arrangement made for faculty supervision, must be approved by the Faculty Graduate Studies Committee. For purposes of registration, this work will be designated as ENGR

8901. The thesis will be evaluated by the student's supervisor(s), and at least two examiners appointed by the Faculty Graduate Studies Committee, one of whom shall be external to the student's department.

- **Time Limit**. All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 term (5 years).

Master of/Magisteriate in Engineering

This program is designed to provide practicing engineers with an opportunity to strengthen and extend the knowledge they have obtained at the undergraduate level, to develop their design skills, and to enhance their ability to present technical material in written form.

Admission Requirements. Applicants to the MEng Program must hold a bachelor's degree in engineering or equivalent with high standing. Applicants with a bachelor's degree in architecture with high engineering content may also be considered for the MEng program. Such students will be required to enrol in an extended program. The Faculty Graduate Studies Committee will determine the acceptability of an applicant for admission to the program and may require an applicant to take specified undergraduate courses in order to qualify for acceptance. Qualified applicants requiring prerequisite courses may be required to take such courses in addition to their regular graduate program. Applicants with deficiencies in their undergraduate preparation may be required to take a qualifying program. An ability to write simple programs in a standard computer language will be assumed. Students lacking this skill will be required to register for the appropriate course. This course will be taken in addition to regular degree requirements.

Applications. Applications for admission from within Canada must be complete by June 1 for the Fall term, October 1 for the Winter term, and February 1 for the Summer term. Applications from outside Canada must be complete by February 15 for the Fall term, June 15 for the Winter term, and October 15 for the Summer term.

Requirements for the Degree

- **Credits**. A fully-qualified candidate is required to complete successfully a minimum of 45 credits. For specific program requirements, refer to the relevant departmental entry in the following pages. Each individual program of study must be approved by the student's department.
- **Transfer Credits**. Student may be granted transfer academic credits for, in general, not more than 12 credits taken in approved graduate studies prior to their entry into this program. A course submitted for transfer credits must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.

- **Other Courses**. A limited number of credits are recognized toward the Master of/Magisteriate in Engineering degree for courses taken under the heading Impact of Engineering on Society and for cognate courses taken from the MBA program. For details refer to the relevant departmental entry in the following pages.
- **Cross-Registration**. A student in the program wishing to take courses under the cross-registration scheme must first obtain approval of the Faculty Graduate Studies Committee.
- **Time Limit**. All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 term (5 years).

Project. Depending on individual department requirements, students may choose to do one or more projects as part of their program. They do so by registering for one or more of the sequence ENGR 6971, 6981, 6991. Where students choose to carry out a multi-course project, the project will be graded by at least two professors.

ENGR 6971 Project and Report I (4 credits). The purpose of the project report is to provide students in the MEng program with an opportunity to carry out independent project work and to present it in an acceptable form. The project may consist of the following:

- A theoretical study of an engineering problem.
- A design and/or development project conducted at Concordia.
- A design and/or project conducted as part of the student's full-time employment, providing the student's employer furnishes written approval for the pursuit and reporting of the project.
- An ordered and critical exposition of the literature on an appropriate topic in engineering.

Before registration for a project course, a student must obtain written consent of a faculty member who will act as advisor for the report. A form for this consent is available in the Office of the Dean of Engineering and Computer Science.

A four-credit report is due on the last day of classes of the term (fall, winter, summer) in which it is registered. Students are expected to have a preliminary version of their report approved by their advisor before its final submission. On or before the submission deadline, students must submit three copies of the report to their advisors, who will grade the report. One copy of the report will be returned to the students, one retained by the advisors, and one by the department.

The report, including an abstract, must be suitably documented and illustrated, should be at least 5000 words in length, must be typewritten on one side of 21.5 cm by 28 cm white paper of quality, and must be enclosed in binding. Students are referred to *Form and Style: Thesis, Report, Term Papers, fourth edition by Campbell and Ballou, published by Houghton Migglin*.

ENGR 6981 Project and Report II (4 credits)

ENGR 6991 Project and Report III (5 credits)

With the permission of their Department, students in the MEng Program may register for these project courses if they wish to carry out a more extended project, or if they wish to complete further projects. Each project course requires prior approval by the faculty member who has accepted to supervise the work. Students working on a multi-course project must register for the corresponding project courses in successive terms. For ENGR 6991 and multi-course projects, the report is due on the last day of classes of the last term in which they are registered. In the case of ENGR 6991 and multi-course project, three copies of the report must be submitted to the advisor on or before this deadline, and students are also required to make an oral presentation to the evaluators, and other members of the community. The report will be evaluated by the advisor and at least one other Engineering and Computer Science member of the Faculty.

Industrial Experience Option in the Master of Engineering

Applicants to the Master of Engineering may apply to the Industrial Experience option in the industrial milieu through the Institute for Co-operative Education. Students should indicate their choice on the application form. The Institute for Co-operative Education will help them with resumes, cover letters and interview techniques. The suggested schedule is as follows: fall and winter terms will be dedicated to course work followed by one term in industry, culminating with two terms in University for the remaining course work. The industrial experience term will be noted on the student transcript/record.

Students apply to the Industrial Experience option as early as possible, preferably when they enter the program. It is preferable to be bilingual in French and English if they wish to work in Quebec. Students who lack good language skills and still want to be part of the program should improve their language skills prior to final acceptance.

Admission Criteria

Students need to be enrolled in the Industrial Experience option at least the semester before going on a work term. They begin applying for jobs the semester prior to the work term. Previous work experience cannot be used toward credit for the ENCS 6931. Students should have good grades (greater than a CGPA of 3.40) for the master's program, be full-time and have good communication skills. A Canadian work permit is required. The Departmental Co-op Program Director will recommend final acceptance to the Industrial Experience option.

ENCS 6931 Industrial Stage and Training (9 credits)
Prerequisite: Completion of at least twenty credits in the program and permission of the Departmental Co-

op Program Director.

This is an integral component of the Industrial Experience option that is to be completed under the supervision of an experienced engineer/computer scientist in the facilities of a participating company (a Canadian work permit is required).

Each student receives an assessment from the Departmental Co-op Program Director in consultation with the industry supervisor and the faculty advisor. Grading is on a pass/fail basis based on a proposal, monthly progress reports, a final report and a presentation.

Building, Civil and Environmental Engineering

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Building, Civil and Environmental Engineering Website

Doctor of/Doctorate in Philosophy (Building Engineering)
Master of/Magisteriate in Applied Science (Building Engineering)
Master of/Magisteriate in Engineering (Building Engineering)
Graduate Certificate in Building Engineering
Doctor of/Doctorate in Philosophy (Civil Engineering)
Master of/Magisteriate in Applied Science (Civil Engineering)
Master of/Magisteriate in Engineering (Civil Engineering)
Graduate Certificate in Environmental Engineering

Building Engineering

Doctor of/Doctorate in Philosophy (Building Engineering)

See the description of the Doctor of/Doctorate in Philosophy in the general section for the Faculty of Engineering and Computer Science. When PhD program profiles of individual students in Building Engineering extend into related fields such as computer science, economics, mathematics, sociology, etc., the students are required to take appropriate courses outside the Department.

Master's Programs in Building Engineering

The Department offers two 45-credit programs leading to the MASc or MEng degrees with specialization in one of the following four branches:

- Building Science (E21, E22)
- Building Environment (E07, E21, E23)
- Construction Management (E21, E24)
- Building Structures (E06, E21, E31)

Applicants lacking the appropriate engineering background will be required to enrol in an extended program of specified courses. These courses are in addition to the regular 45-credit program.

Requirements for the Degree

The requirements described here are in addition to the general degree requirements for the Master's programs in the Faculty of Engineering and Computer Science.

Master of/Magisteriate in Applied Science (Building Engineering)

Students must complete 45 credits as shown below.

- **Courses**. Four courses (16 credits) chosen from the Engineering Courses section, approved by the student's supervisor and either the Graduate Program Director or the Chair of the Department.
- **Thesis**. 29 credits.

Master of/Magisteriate in Engineering (Building Engineering)

Students must complete 45 credits of 6000 or 7000 level courses. The courses must be selected as follows:

- A minimum of 21 credits chosen from one of the Course Groups in List A. This set of courses may also include the project and seminar courses ENGR 6991, BCEE 6961 or the industrial training course ENCS 6931.

  Note: Students who have taken ENCS 6931 cannot take any of the following three courses: ENGR 6971, ENGR 6981 or ENGR 6991; and vice-versa.

- A minimum of 12 credits chosen from the Topic Area E35 and those Course Groups of List A other than the group chosen in (1) above. These groups of courses could include special program courses put on for or by a given industry in conjunction with the Faculty.
- A maximum of 12 credits chosen from the Engineering Courses section including E72 (MBA courses).

List A: Course Groups in Building Engineering Program

Group 1 - Building Environment: BLDG 6611** plus courses in the Topic Areas: E07, E21, E23.

Group 2 - Building Science: BLDG 6611** plus courses in the Topic Areas: E21, E22.

Group 3 - Building Structures: Topic Areas: E06, E21, E31.

Group 4 - Construction Management: Topic Areas: E21, and E24.

** Students who completed the undergraduate equivalent of BLDG 6611 must replace it by a course to be approved by the Graduate Program Director.

Graduate Certificate in Building Engineering

Admission requirements

Applicants to a certificate must hold a bachelor's degree in engineering or architecture or equivalent with an above-average standing. The Department will recommend on the acceptability of an applicant for admission to the program and may require the applicant to do specific remedial course work to meet the program requirements.

Requirements for completion

The program can be completed in one to three years. Students with high standing in their bachelor program and whose academic records satisfy the requirements for good standing in the Master's Program in Building Engineering may apply for transfer to the Master's program.

- **Credits**. A fully qualified candidate is required to complete a minimum of 16 credits.
- **Courses**. Candidates in the graduate certificate program must take 12 credits of core courses in an area of concentration while the balance of 4 credits may be chosen from the elective list or other courses offered by the Department. Core courses for which credits have been credited to another certificate or program must be replaced by elective courses in the area of concentration or by other courses on special permission.
- **Performance**. Students who have completed at least two courses will be assessed in June of each year. To be permitted to continue, students must have obtained a weighted cumulative grade point average (CGPA) of at least 2.75.
- **Graduation**. To be eligible to graduate, students must have obtained a CGPA of at least 2.75.

Courses

Building Science. Core courses: BLDG 6611, 6621*, 6751*.

Electives: BLDG 6651*, 6721*, 6731*, 7401, ENGR 6601, 6661.

Building Envelope. Core courses: BLDG 6601, 6611, 6661.

Electives: BLDG 6061, 6071, 6591*, 6621*, 6731, 6671.

Construction Management. Core courses: BLDG 6561*, 6571, 6831*.

Electives: BLDG 6581, 6801, 6811*, 6821*, 6851, 6861.

Energy Efficiency. Core courses: BLDG 6661, 6701, 6711.

Electives: BLDG 6611, 6741, 6761, 6781, ENGR 6651, 6601, 6811.

Indoor Environment. Core courses: BLDG 6701, 6731*, 6751*.

Electives: BLDG 6111, 6661, 6721*, 6791, ENGR 6601, CIVI 6601.

Rehabilitation of Urban Infrastructure. Core courses: ENGR 6721, ENGR 6731, BLDG 6831.

Electives: BLDG 6801, 6581, 7601, CIVI 6101, CIVI 6541, MECH 6501.

Facility Management. Core course: BLDG 6631, 6561, 6711.

Electives: BLDG 6581, 6701, 6741, 6751, 6761, 6111, 6781. One course from E72 may be taken with permission from GPD.

* This course cannot be taken for credit by students who have completed the undergraduate equivalent.

Civil Engineering

Doctor of/Doctorate in Philosophy (Civil Engineering)

See the description of the Doctor of/Doctorate in Philosophy requirements in the general section on the Faculty of Engineering and Computer Science

Master's Programs in Civil Engineering

The Department offers two 45-credit programs leading to the MASc or MEng degrees with specialization in one of the following six branches:

- Structural Engineering (E06, E31, E32)
- Water Resources (E04, E33)
- Geotechnical Engineering (E35)
- Transportation (E03, E34)
- Environmental Engineering (E36, E37)
- Construction Management (E21, E24)

Applicants lacking the appropriate background will be required to enrol in an extended program of specified courses. These courses are in addition to the regular 45-credit program.

Requirements for the Degree

The requirements described here are in addition to the general degree requirements for the Master's/Magisteriate programs in the Faculty of Engineering and Computer Science.

Master of/Magisteriate in Applied Science (Civil Engineering)

Students must complete 45 credits as shown below:

- **Courses**. Four courses (16 credits) chosen from the Engineering Courses section, approved by the student's supervisor and either the Graduate Program Director or the Chair of the Department.
- **Thesis**. 29 credits.

Master of/Magisteriate in Engineering (Civil Engineering)

Students must complete 45 credits of 6000 or 7000 level courses. The courses must be selected as follows:

- A minimum of 21 credits chosen from one of the Course Groups in List B. This set of courses may also include the project and seminar courses ENGR 6991, BCEE 6961 or the industrial training course ENCS 6931.

  Note: Students who have taken ENCS 6931 cannot take any of the following three courses: ENGR 6971, ENGR 6981 or ENGR 6991; and vice-versa.

- A minimum of 12 credits chosen from those Course Groups of List B other than the group chosen in (1) above. These groups of courses could include special program courses put on for or by a given industry in conjunction with the Faculty.
- A maximum of 12 credits chosen from the Engineering Courses section including E72 (MBA courses).

List B: Course Groups in Civil Engineering Program

Group 1 - Environmental Engineering and Water Resources:

Topic Areas: E04, E33, E36, E37

Group 2 - Geotechnical and Transportation Engineering:

Topic Areas: E03, E34, E35

Group 3 - Structural Engineering:

Topic Areas: E06, E31, E32

Group 4 - Construction Management:

Topic Areas: E21, E24

Graduate Certificate in Environmental Engineering

Admission requirements

Applicants to a certificate must hold a bachelor's degree in engineering with an above-average standing. The Department will recommend on the acceptability of an applicant for admission to the program and may require the applicant to do specific remedial course work to meet the program requirements.

Requirements for completion:

The program can be completed in one to three years. Students with high standing in their bachelor program and whose academic records satisfy the requirements for good standing in the Master's Program in Civil Engineering may apply for transfer to the Master's program.

- **Credits**. A fully qualified candidate is required to complete a minimum of 16 credits.
- **Courses**. Candidates in the graduate certificate program must take 12 credits of core courses in an area of concentration while the balance of 4 credits may be chosen from the elective list or other courses offered by the Department. Core courses for which credits have been credited to another certificate or program must be replaced by elective courses in the area of concentration or by other courses on special permission.
- **Performance**. Students who have completed at least two courses will be assessed in June of each year. To be permitted to continue, students must have obtained a weighted cumulative grade point average (CGPA) of at least 2.75.
- **Graduation**. To be eligible to graduate, students must have obtained a CGPA of at least 2.75.

Courses

Industrial Waste Management. Core courses: CIVI 6611, CIVI 6481, ENGR 6971.

Electives: CIVI 6641, CIVI 6491, CIVI 6651, CIVI 6621, CIVI 6631.

Environmental Auditing. Core courses: CIVI 6491, CIVI 6671, CIVI 6661.

Electives: CIVI 6481, CIVI 6631, POLI 6051, ENGR 6401, ENGR 6831.

Modelling in Environmental Systems. Core courses: CIVI 6601, CIVI 6651, CIVI 6611.

Electives: CIVI 6671, 6661, 6491, 6621, 6641, BLDG 6721.

Concordia Institute for Information Systems Engineering

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Concordia Institute for Information Systems Engineering Website

Doctor of/ Doctorate in Philosophy in Information and Systems Engineering
Master of/Magisteriate in Applied Science in Information Systems Security
Master of/Magisteriate in Engineering in Information Systems Security
Master of/Magisteriate in Applied Science in Quality Systems Engineering
Master of/Magisteriate in Engineering in Quality Systems Engineering
Graduate Certificate in Service Engineering and Network Management
Graduate Certificate in 3D Graphics and Game Development

Doctor of/ Doctorate in Philosophy in Information and Systems Engineering *

See the description of the Doctor of/ Doctorate in Philosophy requirements in the general section on the Faculty of Engineering and Computer Science

Master of/Magisteriate in Applied Science in Information Systems Security

Admission requirements

Applicants to the Master of/Magisteriate in Applied Science in Information Systems Security must hold a bachelor's degree or equivalent in:

- Computer Engineering
- Software Engineering
- Computer Science
- Any engineering or science discipline provided that the student has a strong background in information systems

Admission to the program is competitive and only applicants with high academic standing will be considered. Qualified applicants requiring prerequisite courses may be asked to take such courses in addition to their

regular graduate program. The Faculty Graduate Studies Committee, in consultation with the Institute, is responsible for the recommendation of all applications for admission.

Residence requirements. The minimum residence requirement for the Master's degree is three terms (one year) of full-time study, or the equivalent in part-time study.

Transfer from the Master of Engineering in Information Systems Security. Students, in good standing, who have completed a minimum of 12 credits in the Master of Engineering in Information Systems Security, may apply for a transfer to the Master of Applied Science in Information Systems Security.

Degree requirements

The requirements described here are in addition to the general degree requirements for the Master's programs in the Faculty of Engineering and Computer Science.

In order to graduate, students must have a CGPA of at least 3.00.

- **Program of Study.** The student will follow the proposed course sequence. In addition, students have to consult with their supervisor for selecting a research topic. Students can enter this program as Co-op students. See item 6. Thesis
- **Credits.** A fully qualified candidate is required to successfully complete a minimum of 45 credits. Additional credits may be required in some cases.
- **Transfer Credits.** Students may be granted transfer academic credits for, in general, not more than eight credits taken in approved graduate studies prior to their entry into this program. A course submitted for transfer credit must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.
- **Time Limit.** All work for this MASc degree for full-time students must be completed within 12 terms (four years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (five years).
- **Courses.** Students must complete a minimum of 20 credits, including 16 credits of core courses (INSE 6110, INSE 6120, INSE 6130, and INSE 6140) and one 4-credit course as shown below:
    - a course chosen from the topic area E69 Information Systems Security, approved by the student's supervisor, or
    - an INSE course, approved by the student's supervisor and either the Graduate Program Director or the Director of the Institute.
- **Thesis.** Students must complete a 25-credit thesis as part of their degree requirements. The thesis must represent the results of the student's independent work after admission to the program. The proposed topic for the thesis, together with a brief statement outlining the proposed method of treatment, and the arrangement made for faculty supervision, must be approved by the Faculty

Graduate Studies Committee. For purposes of registration, this work will be designated as INSE 8901. The thesis will be evaluated by the student's supervisor(s), and at least two examiners appointed by Faculty Graduate Studies Committee, one of whom shall be external to the student's department.

Students have the option to do the thesis work within the industrial milieu through the Institute for Co-operative Education. The suggested schedule of the program is as follows: fall and winter terms will be dedicated to course work, followed by two or three terms for research and development in industry, culminating in one or two terms in the Institute for the writing and defence of the thesis. Each student in this case will have a supervisor from the Institute and a mentor from industry. The intellectual property will be managed according to the University policy.

Master of/Magisteriate in Engineering in Information Systems Security

Admission Requirements

Applicants to the Master of/Magisteriate in Engineering in Information Systems Security must hold a bachelor's degree or equivalent in:

- Computer Engineering
- Software Engineering
- Computer Science
- Any engineering or science discipline provided that the student has a strong background in information systems

Admission to the program is competitive and only applicants with high academic standing will be considered. Qualified applicants requiring prerequisite courses may be asked to take such courses in addition to their regular graduate program. The Faculty Graduate Studies Committee, in consultation with the Institute, is responsible for the recommendation of all applications for admission.

Residence requirements. The minimum residence requirement for the Master's degree is three terms (one year) of full-time study, or the equivalent in part-time study.

Degree Requirements

The requirements described here are in addition to the general degree requirements for the Master's programs in the Faculty of Engineering and Computer Science.

In order to graduate, students must have a CGPA of at least 3.00.

- **Credits.** A fully qualified candidate is required to successfully complete a minimum of 45 credits. Additional credits may be required in some cases.
- **Transfer Credits.** Students may be granted transfer academic credits for, in general, not more than eight credits taken in approved graduate studies prior to their entry into this program. A course submitted for transfer credits must be appropriate to the student's program study at Concordia University. An application for such credit will be considered only at the time of admission.
- **Time Limit.** All work for this MEng degree for full-time students must be completed within 12 terms (four years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (five years).
- **Courses.** Students must take a total of 45 credits of course work at the 6000 or 7000 level. The breakdown of the 45 credits is as follows:
    - Twenty credits of core courses (INSE 6110, 6120, 6130, 6140, 6150) from topic area E69.
    - Twenty-five credits of 6000 or 7000 numbered courses from any topic area from departments within the Faculty of Engineering and Computer Science. Students shall only take one of the courses (INSE 6961, ENGR 6991, ENCS 6931) from topic area E63.

Master of/Magisteriate in Applied Science in Quality Systems Engineering

Admission Requirements

Applicants to the Master of/Magisteriate in Applied Science in Quality Systems Engineering program must hold a bachelor's degree or equivalent in:

- Mechanical Engineering
- Industrial Engineering
- Electrical Engineering
- Building Engineering
- Civil Engineering
- Environmental Engineering
- Software Engineering
- Computer Science
- Any engineering or science discipline provided that the student has the appropriate background

Admission to this program is competitive and only applicants with high academic standing will be considered. Qualified applicants requiring prerequisite courses may be asked to take such courses in addition to their regular graduate program. The Faculty Graduate Studies Committee, in consultation with the Institute, is responsible for the recommendation of all applications for admission.

Residence Requirements. The minimum residence requirement for the Master's degree is three terms (one year) of full-time study, or the equivalent in part-time study.

Transfer from the Master of Engineering in Quality Systems Engineering.

Students, in good standing, who have completed a minimum of 12 credits in the Master of Engineering in Quality Systems Engineering, may apply for a transfer to the Master of Applied Science in Quality Systems Engineering.

Degree Requirements

The requirements described here are in addition to the general degree requirements for the Master's programs in the Faculty of Engineering and Computer Science.

In order to graduate, students must have a CGPA of at least 3.00.

- **Program of Study.** The student will follow the proposed course sequence. In addition, students have to consult with their supervisor for selecting a research topic. Students can enter this program as Co-op students. See item 6. Thesis
- **Credits.** A fully qualified candidate is required to successfully complete a minimum of 45 credits. Additional credits may be required in some cases.
- **Transfer Credits.** Students may be granted transfer academic credits for, in general, not more than eight credits taken in approved graduate studies prior to their entry into this program. A course submitted for transfer credit must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.
- **Time Limit.** All work for this MASc degree for full-time students must be completed within 12 terms (four years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (five years).
- **Courses.** Students must take a total of 20 credits in course work. These include the three core courses specified in area E68 Quality Systems Engineering and two courses selected from the program elective courses in the topic areas E66, E67, E68, E69 and E70. The student may take a maximum of one elective course that is outside these topic areas, subject to the approval of the Graduate Program Director.
- **Thesis.** Students must complete a 25-credit thesis as part of their degree requirements. The thesis must represent the results of the student's independent work after admission to the program. The proposed topic for the thesis, together with a brief statement outlining the proposed method of treatment, and the arrangement made for faculty supervision, must be approved by the Faculty Graduate Studies Committee. For purposes of registration, this work will be designated as INSE 8901. The thesis will be evaluated by the student's supervisor(s), and at least two examiners

appointed by the Faculty Graduate Studies Committee, one of whom shall be external to the student's department.

Students have the option to do the thesis work within the industrial milieu through the Institute for Co-operative Education. The suggested schedule of the program is as follows: Fall and Winter terms will be dedicated to course work, followed by two or three terms for research and development in industry, culminating in one or two terms in the Institute for the writing and the defence of the thesis. Each student in this case will have a supervisor from the Institute and a mentor from industry. The intellectual property will be managed according to the University policy.

Master of/Magisteriate in Engineering in Quality Systems Engineering

Admission Requirements

Applicants to the Master of/Magisteriate in Engineering in Quality Systems Engineering program must hold a bachelor's degree or equivalent in:

- Mechanical Engineering
- Industrial Engineering
- Electrical Engineering
- Building Engineering
- Civil Engineering
- Environmental Engineering
- Software Engineering
- Computer Science
- Any engineering or science discipline provided that the student has the appropriate background

Admission to this program is competitive and only applicants with high academic standing will be considered. Qualified applicants requiring prerequisite courses may be asked to take such courses in addition to their regular graduate program. The Faculty Graduate Studies Committee, in consultation with the Institute, is responsible for the recommendation of all applications for admission.

Residence Requirements. The minimum residence requirement for the Master's degree is three terms (one year) of full-time study, or the equivalent in part-time study.

Degree Requirements

The requirements described here are in addition to the general degree requirements for the Master's programs in the Faculty of Engineering and Computer Science.

In order to graduate, students must have a CGPA of at least 3.00.

- **Credits.** A fully qualified candidate is required to successfully complete a minimum of 45 credits. Additional credits may be required in some cases.
- **Transfer Credits.** Students may be granted transfer academic credits for, in general, not more than eight credits taken in approved graduate studies prior to their entry into this program. A course submitted for transfer credit must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.
- **Time Limit.** All work for this MEng degree for full-time students must be completed within 12 terms (four years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (five years).
- **Courses.** Students must take a total of 45 credits of course work at the 6000 or 7000 level, including a minimum of 36 credits chosen from the Concordia Institute for Information Systems Engineering's graduate courses.

  The breakdown of the 45 credits is as follows:
  - Twelve credits from core courses in topic area E68.
  - Twenty-four credits from six courses selected from the program elective courses in topic areas E66, E67, E68, E69 and E70.
  - Nine credits from any topic area from departments within the Faculty of Engineering and Computer Science.

    In Topic Area E63 students shall only take ENGR 6991 or INSE 6961 or ENCS 6931.

Graduate Certificate in Service Engineering and Network Management

Admission Requirements

The admission requirement will be a Bachelor of Engineering or Computer Science with a CGPA of at least 3.00 or equivalent as well as a good knowledge in software engineering/development. The Institute will recommend on the acceptability of an applicant for admission to the program and may require the applicant to do specific remedial course work to meet the program requirements.

Requirements for Completion:

- **Credits.** A minimum of 20 credits.
- **Courses.** Candidates in the graduate certificate program must take 16 credits of core courses while the balance of 4 credits may be chosen from the elective list or other courses offered by the Institute or other ENCS departments.

- **Good Standing.** Students who have completed at least two courses will be assessed in June of each year. To be permitted to continue, students must have obtained a weighted cumulative grade point average (CGPA) of at least 3.00.
- **Graduation.** To be eligible to graduate, students must have obtained a CGPA of at least 3.00.
- **Courses**
  Core courses
  INSE 6120 Crypto-Protocol and Network Security
  ELEC 6861 Higher Layer Telecommunications Protocols
  INSE 7110 Value Added Service Engineering in Next Generation Networks
  INSE 7120 Advanced Network Management

  Electives
  INSE 6100 Advanced Java Platforms
  COMP 6471 Software Design Methodologies
  COEN 7311 Protocol Design and Validation
  COMP 7231 Distributed Computer Systems

  Prerequisites
  Special Permission must be obtained from the Concordia Institute for Information Systems Engineering.

Graduate Certificate in 3D Graphics and Game Development

Admission Requirements

The admission requirement will be a Bachelor of Engineering or Computer Science with a CGPA of at least 3.00 or equivalent, as well as knowledge in software engineering/development. The Institute will recommend on the acceptability of an applicant for admission to the program and may require the applicant to do specific remedial course work to meet the program requirements.

Requirements for Completion:

- **Credits.** A minimum of 16 credits.
- **Courses.** Candidates in the graduate certificate program must take 16 credits of the following core courses:
  INSE 6510 Video Game Technology and Development
  COMP 6761 Advanced 3D Graphics for Game Programming
  INSE 6530 3D Graphics and Computer Animation for Game Design
  COMP 7661 Advanced Rendering and Animation for 3D Games

Prerequisites

Special Permission must be obtained from the Concordia Institute for Information Systems Engineering

- **Good Standing.** Students who have completed at least two courses will be assessed in June of each year. To be permitted to continue, students must have obtained a weighted cumulative grade point average (CGPA) of at least 3.00.
- **Graduation.** To be eligible to graduate, students must have obtained a CGPA of at least 3.00.

Electrical and Computer Engineering

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Electrical and Computer Engineering Website

Doctor of/Doctorate in Philosophy (Electrical and Computer Engineering)
Master of/Magisteriate in Applied Science (Electrical and Computer Engineering)
Master of/Magisteriate in Engineering (Electrical and Computer Engineering)

Doctor of/Doctorate in Philosophy (Electrical and Computer Engineering)

See the description of the Doctor of/Doctorate in Philosophy requirements in the general section on the Faculty of Engineering and Computer Science

Master's Programs in Electrical and Computer Engineering

Requirements for the Degree

The requirements described here are in addition to the general degree requirements for the Master's/Magisteriate Programs in the Faculty of Engineering and Computer Science

Master of/Magisteriate in Applied Science (Electrical and Computer Engineering)

Students must complete 45 credits as shown below.

- **Courses.** A minimum of 16 credits chosen from the Engineering Courses section, approved by the student's supervisor and either the Graduate Program Director or the chair of the department.
- **Thesis**. 29 credits.

Master of/Magisteriate in Engineering (Electrical and Computer Engineering)

Students must complete 45 credits distributed as follows:

- A minimum of 36 credits consisting of 6000 numbered courses chosen from Topic Areas: E01, E03, E10, E42, E43, E44, E45, E47, E48, F03, and ELEC/COEN courses in E02.

- The remaining credits are chosen from the industrial training (ENCS 6931) or seminar and projects in E63. These credits may be taken from the Engineering Courses section with the permission of the Department on a case-by-case basis.

  Note: Students who have taken ENCS 6931 cannot take any of the following three courses: ENGR 6971, ENGR 6981 or ENGR 6991; and vice-versa.

Centre for Engineering in Society

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Centre for Engineering in Society Website

The Centre for Engineering in Society administers common engineering and computer science courses.

Mechanical and Industrial Engineering

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Mechanichal and Industrial Engineering Website

Doctor of/Doctorate in Philosophy (Mechanical Engineering)
Master of/Magisteriate in Applied Science (Mechanical Engineering)
Master of/Magisteriate in Engineering (Mechanical Engineering)
Master of/Magisteriate in Engineering (Aerospace)
Graduate Certificate in Mechanical Engineering
Doctor of/Doctorate in Philosophy (Industrial Engineering)
Master of/Magisteriate in Applied Science (Industrial Engineering)
Master of/Magisteriate in Engineering (Industrial Engineering)

A. Graduate Degrees in Mechanical and Industrial Engineering

1. Mechanical Engineering

Doctor of/Doctorate in Philosophy (Mechanical Engineering)

See the description of the Doctor of/Doctorate in Philosophy requirements in the general section on the Faculty of Engineering and Computer Science

Master's Programs in Mechanical Engineering

The Department offers two 45-credit programs leading to MASc or MEng degrees in Mechanical Engineering.

Requirements for the Degree

The requirements described here are in addition to the general degree requirements for the Master's Programs in the Faculty of Engineering and Computer Science

Master of/Magisteriate in Applied Science (Mechanical Engineering)

Students must complete 45 credits as shown below:

- **Courses.** (16 credits) chosen from the Engineering Courses section, approved by the student's supervisor and either the Graduate Program Director or the Chair of the Department.
- **Thesis**. 29 credits.

Master of/Magisteriate in Engineering (Mechanical Engineering)

Students may specialize in one of the following branches: a. Industrial Control Systems; b. Materials and Composites; c. Mechanical Systems; d. Thermofluid Engineering. Students must complete 45 credits in courses. Courses must be selected as follows:

- A minimum of 16 credits chosen from the courses listed in one of the following specialization areas:
  - **Industrial Control Systems:** MECH 6021, 6061, 6071, 6621, 6631; ENGR 6301, 6411.
  - **Materials and Composites:** MECH 6441, 6501, 6511, 6521, 6561, 6581.
  - **Mechanical Systems:** MECH 6431, 6481, 6751, 6761, 7711; ENGR 6301, 6311.
  - **Thermofluids Engineering:** MECH 6111, 6121, 6131, 6171, 6181; ENGR 6201, 6261.
- A minimum of 20 credits chosen from Topic Areas E01, E03, E04, E05, E06, E10, E11‡, E12, E51, E52, E53, E54, E56, E57, MECH courses in E02, E63 (ENCS 6931 or any of ENGR 6971, ENGR 6981, and ENGR 6991).
- The remaining credits may be chosen from:
  - Graduate seminar in Mechanical and Industrial Engineering, ENGR 7011 (1 credit)
  - Courses chosen from other Topic Areas in the Engineering Courses section. (The student must obtain written approval from the Department that offers the course).

‡ Students must obtain approval from the Aerospace Program Director for all the courses listed in topic area E11.

Master of/Magisteriate in Engineering (Aerospace)

Admission Requirements. Applicants must hold a Bachelor's degree in engineering or equivalent with high standing. For further details, refer to the section Admission Requirements for Master of/Magisteriate in Engineering in the appropriate pages of the graduate calendar.

Requirements for the Degree

Students must complete a minimum of 45 credits of academic work consisting of: 36 credits of course work in the 6000 or 7000 level (2 courses must be taken outside Concordia), Aerospace Case Study (minimum 3 credits) and an Industrial Stage (6 credits). The selection of courses must be approved by the program director. For course prerequisites, refer to the course descriptions.

Note: Some graduate courses are content equivalent with specified undergraduate courses. These courses are not available for credit to students who have completed the undergraduate equivalent. Refer to the course description where such courses are marked with an (*).

- **General/Preparatory Core Courses.** Normally, 12 credits are required to be completed from the list provided below. Any request for change on this requirement must be approved by the program director. Depending on the background, it may be required for the student to complete certain specified preparatory courses as part of their program.

  ENCS 6021, 6141; INDU 6131, 6351; ENGR 6121, 6131, 6181, 6201, 6421, 6441, 6461, 6501; MECH 6481.

- **Specialization Courses.** 24 credits are to be completed from the specialization courses in one or more of the areas listed below. For other courses available from the participating universities, consult their listings.

  Students should consult the program director at their home university for the selection of courses to suit their area of specialization and need not confine their choice to any one area. A minimum of two courses are to be taken outside of Concordia (minimum 3 credits per course), at least one each from any two of the participating universities (refer to the list of courses below). A second Aerospace Case Study course may be considered as a specialization course.

  - **Aeronautics and Propulsion.**

    ENGR 6251, 6261; MECH 6081, 6111, 6121, 6161, 6171, 6191, 6211, 6231, 6241.

    McGill University: Mech 532 (Aircraft Performance, Stability and Control), Mech 537 (Aerodynamics).

  - **Avionics and Control.**

    ENCS 6161; ELEC 6121, 6301, 6321, 6361, 6381, 6511, 6601, 7111, 7121, 7341, 7531; ENGR 6181, 6411, 7401, 7461; MECH 6061, 6091, 6251, 6621;

    École Polytechnique: ELE6208 (Dynamique du vol et auto-pilotage).

    McGill University: 304-593B (Antennas and Propagation), Com 538 (Person-Machine Communication).

    Note: Students may not take both ELEC 6511 and MECH 6621.

- **Structures and Materials**.
  ENGR 6311, 6511, 6521, 6531, 6541, 7331;

  MECH 6301, 6321, 6441, 6481, 6561, 6581, 7501;

  McGill University: Mech 432 (Aircraft Structures), Mech 532 (Aeroelasticity), Mech 635 (Fracture and Fatigue).

- **Space Engineering**.

  ENGR 6951, 7201; MECH 7221;

  École Polytechnique: ELE6502 (Instrumentation automatisée en micro-ondes).

  McGill University: Mech 542 (Spacecraft Dynamics).

- **Aerospace Case Study.** A minimum of three credits (up to a maximum of six credits) must be obtained from the Aerospace Case Study courses. These courses, organized by CIMGAS, are conducted by experts from industry, and are given at one of the participating universities. The material given in a particular case study course might be offered only once. It is, therefore, the responsibility of the student to choose an appropriate course when it is offered. Space in some case study courses may be limited. These courses are:

  MECH 6961 Aerospace Case Study I (3 credits)

  MECH 6971 Aerospace Case Study II (3 credits)

  ENGR 7961 Industrial Stage and Training (6 credits)
  Prerequisite: Completion of at least twelve credits in the composite option and at least twenty-one credits in the aerospace program or permission of program director.
  This is an integral component of the aerospace program in the Mechanical Engineering program that is to be completed under the supervision of an experienced engineer in the facilities of a participating company (Canadian work permit is required). The topic is to be decided by a mutual agreement between the student, the participating company and the program director. The course is graded on the basis of the student's performance during the work period, which includes a technical report.

  There may be some restrictions placed on students chosen for the industry sponsored "stage". For those students who are unable to obtain an industrial stage, it is possible to take ENGR 7961 for a

project carried out at the university. Such students must obtain the approval of the program director.

Career Prospects. In Montreal, graduates have found work in companies such as Pratt & Whitney Canada, Bell Helicopter, CAE Electronics, Bombardier Aerospace, and others. They hold positions as varied as consulting engineers, aircraft designers, manufacturing plant managers, vice presidents, and chief executive officers. Some have also gone on to form their own companies, while others have taken jobs across Canada and abroad. A number of our graduates hold teaching positions in several universities across North America and in other countries.

2. Industrial Engineering

Doctor of/Doctorate in Philosophy (Industrial Engineering) *

See the description of the Doctor of/Doctorate in Philosophy requirements in the general section on the Faculty of Engineering and Computer Science

Master's Programs in Industrial Engineering

The Department offers two 45-credit programs leading to MASc or MEng degrees in Industrial Engineering. Applicants lacking the appropriate engineering background will be required to enrol in an extended program of specified courses. These courses are in addition to the regular 45-credit program.

Requirements for the Degree

The requirements described here are in addition to the general degree requirements for the Master's Programs in the Faculty of Engineering and Computer Science

Master of/Magisteriate in Applied Science (Industrial Engineering)

Students must complete 45 credits as shown below:

- **Courses.** A minimum of four courses (16 credits) chosen from the Engineering Courses section, approved by the student's supervisor and either the Graduate Program Director or the Chair of the Department.
- **Thesis**. 29 credits.

Master of/Magisteriate in Engineering (Industrial Engineering)

Students must complete 45 credits of course-work as described below:

- **Specialization Courses:** A minimum of nine courses (36 credits) chosen as follows:
  - **Core Courses:** The following three INDU courses (12 credits) in topic area E12 must be completed:
    INDU 6111, 6211, 6311.
  - **Area Electives:** A minimum of 16 credits must be completed from the courses listed below:
    INDU courses in topic area E12 excluding the core courses;
    ENCS 6191;
    ENGR 7011 (1 credit);
    MECH 6421, 6611, 6631, 6941†.
  - **Department Electives:**
    Other INDU 6000, MECH 6000† and MECH 7000† level courses.
- **General Electives**
  Up to 9 credits may be chosen from courses listed under the Topic Area E72 or other topic areas in the Engineering Courses section. The student must obtain written approval from the Departments that offer these courses.
- **Project Courses**

  A student may take project courses (ENGR 6971, ENGR 6981, ENGR 6991) or the industrial training (ENCS 6931), replacing courses specified in Department Electives or courses specified in General Electives.

  † Students must obtain approval from the Aerospace Program Director for all the courses listed in Topic Area E11.

B. Graduate Certificate Program

Graduate Certificate in Mechanical Engineering

Admission Requirements. Applicants to the program must hold a bachelor's degree in engineering with above-average standing. The Faculty Graduate Studies Committee will determine the acceptability of an applicant for admission to the program and may require the applicant to do specific remedial course work to meet the program requirements.

Requirements for Completion

The Graduate Certificate program can be completed in one to three years. Students with high standing in their Bachelor's program and whose academic records satisfy the requirements for Good Standing in the Master's program in Mechanical Engineering (see Engineering Programs section) may apply for transfer to the Master's program.

- **Credits.** A fully-qualified candidate is required to complete a minimum of 16 credits in one of the fields of concentration listed below.
- **Courses.**
  - Minimum of 12 credits of core courses, depending on the area of concentration.
  - Maximum of 4 credits of electives, chosen from the elective courses listed or from core courses of any other areas of concentration.
- **Good Standing.** Students who have completed at least two courses will be assessed in June of each year. To be permitted to continue, students must have a cumulative grade point average (CGPA) of at least 2.75.
- **Graduation.** To be eligible to graduate, students must have obtained a cumulative grade point average (CGPA) of at least 2.75.

Courses

All courses are 4-credits. The core courses in the different areas of concentration are:

Aerospace

MECH 6091 Flight Control Systems
MECH 6121 Aerodynamics (*)
MECH 6161 Gas Turbine Design (*)
MECH 6171 Turbomachinery and Propulsion (*)
MECH 6231 Helicopter Flight Dynamics
MECH 6241 Operational Performance of Aircraft
ENGR 6201 Fluid Mechanics
ENGR 6421 Standards, Regulations and Certification
ENGR 6441 Materials Engineering for Aerospace
ENGR 6461 Avionic Navigation System

Composite Materials

MECH 6441 Stress Analysis in Mechanical Design
MECH 6501 Advanced Materials
MECH 6521 Manufacturing of Composites (*)
MECH 6581 Mechanical Behaviour of Polymer Composite Materials (*)
MECH 6601 Testing and Evaluation of Polymer Composite Materials and Structures

Controls and Automation

MECH 6021 Design of Industrial Control Systems (*)
MECH 6061 Analysis and Design of Hydraulic Control Systems (*)
MECH 6081 Fuel Control Systems for Combustion Engines
MECH 6091 Flight Control Systems
MECH 6621 Microprocessors and Applications (*)
ENGR 6181 Digital Control of Dynamic Systems
ENGR 6411 Robotic Manipulators I: Mechanics (*)
ENGR 6461 Avionic Navigation Systems

Theoretical and Computational Fluid Dynamics

ENGR 6201 Fluid Mechanics
ENGR 6251 The Finite Difference Method in Computational Fluid Dynamics
ENGR 6261 The Finite Element Method in Computational Fluid Dynamics
MECH 6101 Kinetic Theory of Gases
MECH 6111 Gas Dynamics (*)
MECH 6121 Aerodynamics (*)

Manufacturing Systems

INDU 6341 Advanced Concepts in Quality Improvement (*)
INDU 6351 System Reliability
MECH 6421 Metal Machining and Surface Technology
MECH 6431 Introduction to Tribology (Wear, Friction and Lubrication)
MECH 6511 Mechanical Forming of Metals (*)
ENGR 6711 Engineering Systems and Cost Analysis
ENCS 6191 Fuzzy Sets and Fuzzy Logic

Elective Courses

ENCS 6141 Probabilistic Methods in Design
INDU 6111 Theory of Operations Research
INDU 6411 Human Factors Engineering (*)
ENCS 6161 Probability and Stochastic Processes
ENCS 6181 Optimization Techniques I (*)
ENGR 6131 Linear Systems (*)
ENGR 6301 Advanced Dynamics
ENGR 6311 Vibrations in Machines and Structures
ENGR 6371 Micromechatronic Systems and Applications

ENGR 6831 Technology Assessment: Life Cycle Assessment
MECH 6051 Process Dynamics and Control (*)
MECH 6181 Heating, Air Conditioning and Ventilation (*)
MECH 6301 Vibration Problems in Rotating Machinery
MECH 6311 Noise and Vibration Control
MECH 6441 Stress Analysis in Mechanical Design
MECH 6451 Computer-Aided Mechanical Design
MECH 6471 Aircraft Structures
MECH 6481 Aeroelasticity (*)
MECH 6531 Casting
MECH 6541 Joining Processes and Nondestructive Testing
MECH 6551 Fracture
MECH 6561 High Strength Materials
MECH 6611 Numerically Controlled Machines
MECH 6631 Industrial Automation
MECH 6641 Engineering Fracture Mechanics and Fatigue
MECH 6651 Structural Composites
MECH 6671 Finite Element Method in Machine Design
MECH 6751 Vehicle Dynamics (*)
MECH 6771 Driverless Ground Vehicles (*)

(*) This course cannot be taken for credit by students who have completed the undergraduate equivalent.

Engineering Courses

- Back to Original Version

Courses offered in the Certificate, Master's and PhD programs in Engineering are one-term four-credit courses unless otherwise specified. Not all courses are offered each year. In these programs, a one-term course consists of one three-hour period per week for thirteen weeks, or equivalent. All 4-credit courses include a project chosen in consultation with the course instructor, requiring a written report. The final examination in the one-term course will be written after the thirteenth week, or during an examination period specified for each term. A course given in the summer term will, in general, consist of two three-hour periods per week for six and one-half weeks, or equivalent. For additional information concerning course descriptions and schedules, contact the appropriate department or the Office of the Associate Dean. (See note regarding the permitted number of credits from topic area E72 under the degree requirements section for each program). The courses are listed below, grouped under appropriate topic areas. The content of some graduate courses is equivalent to that of specified undergraduate courses. Such graduate courses, marked with (*), cannot be taken for credit by students who have completed the undergraduate equivalent. Courses marked with (**) cannot be taken for credit by students who have completed the Bachelor of/Baccalaureate in Engineering (Building) Program.

List of Courses by Topic Areas

E00 - REVIEW/MAKE-UP COURSES

Students who lack the mathematics and systems background for graduate programs in engineering may be required to take the course in this section. This course cannot be taken for credit towards the requirements of a graduate degree.

ENCS 6001 Elements of Engineering Mathematics

E01 - MATHEMATICAL METHODS

ENCS 6021 Engineering Analysis
ENCS 6111 Numerical Methods
ENCS 6141 Probabalistic Methods in Design
ENCS 6161 Probability and Stochastic Processes

ENCS 6181 Optimization Techniques (*)
ENCS 6191 Fuzzy Sets and Fuzzy Logic

E02 - DEVELOPMENTS IN ENGINEERING

Note: Subject matter will vary from term to term and from year to year. Students may re-register for these courses, providing that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g., CIVI 691A, CIVI 691B, etc.

ENCS 591 Topics in Engineering and Computer Science
ENCS 691 Topics in Engineering and Computer Science I
ENGR 691 Topics in Engineering I
ENGR 791 Topics in Engineering II
BLDG 691 Topics in Building Engineering I
BLDG 791 Topics In Building Engineering II
CIVI 691 Topics in Civil Engineering I
CIVI 791 Topics In Civil Engineering II
COEN 691 Topics In Computer Engineering I
COEN 791 Topics In Computer Engineering II
ELEC 691 Topics in Electrical Engineering I
ELEC 791 Topics in Electrical Engineering II
INDU 691 Topics in Industrial Engineering
INSE 691 Topics in Information Systems Engineering
MECH 691 Topics In Mechanical Engineering I
MECH 791 Topics in Mechanical Engineering II

E03 - SYSTEMS AND CONTROL

ELEC 6041 Large-scale Control Systems
ELEC 6061 Real-time Computer Control Systems
ELEC 6091 Discrete Event Systems
ENGR 6071 Switched and Hybrid Control Systems
ENGR 6131 Linear Systems (*)
ENGR 6141 Nonlinear Systems
ENGR 7121 Analysis and Design of Linear Multivariable Systems
ENGR 7131 Adaptive Control
ENGR 7181 Digital Control of Dynamic Systems
MECH 6681 Dynamics and Control of Nonholonomic Systems

E04 - FLUID MECHANICS

ENGR 6201 Fluid Mechanics
ENGR 6221 Microfluidic Systems
ENGR 6241 Hydrodynamics
ENGR 6251 The Finite Difference Method in Computational Fluid Dynamics
ENGR 6261 The Finite Element Method in Computational Fluid Dynamics
ENGR 6281 Modeling Turbulent Flows
ENGR 6291 Rheology

E05 - DYNAMICS AND VIBRATIONS OF MECHANICAL AND BIOMECHANICAL SYSTEMS

ENGR 6191 Introduction to Biomedical Engineering
ENGR 6301 Advanced Dynamics
ENGR 6311 Vibrations in Machines and Structures (*)
MECH 6301 Vibration Problems in Rotating Machinery
MECH 6311 Noise and Vibration Control
MECH 6321 Optimum Design of Mechanical Systems
MECH 6351 Modal Analysis of Mechanical Systems
MECH 6361 Mechanics of Biological Tissues
ENGR 7331 Random Vibrations

E06 - STRUCTURAL MECHANICS

ENGR 6501 Applied Elasticity
ENGR 6511 Matrix Analysis of Structures (*)
ENGR 6531 The Finite Element Method in Structural Mechanics
ENGR 6541 Structural Dynamics
ENGR 6551 Theory of Elastic and Inelastic Stability
ENGR 6561 Theory of Plates and Shells
ENGR 6571 Energy Methods in Structural Mechanics
ENGR 6581 Introduction to Structural Dynamics (*)
ENGR 7521 Advanced Matrix Analysis of Structures
ENGR 7531 Boundary Element Method in Applied Mechanics

E07 - ENERGY CONVERSION

BLDG 6951 Passive Solar Building Design
ENGR 6601 Principles of Solar Engineering

ENGR 6611 Equipment Design for Solar Energy Conversion
ENGR 6661 Solar Energy Materials Science
ENGR 6811 Energy Resources: Conventional and Renewable

E08 - ACADEMIC, MANAGEMENT AND COMMUNICATION SKILLS

ENCS 5721 Composition and Argumentation for Engineers
ENCS 6041 Creativity, Innovation, and Critical Thinking
ENCS 6721 Technical Writing and Research Methods for Scientists and Engineers

E10 - ROBOTICS

ENGR 6411 Robotic Manipulators I: Mechanics (*)
ENGR 7401 Robotic Manipulators II: Control

E11 - AERONAUTICS AND ASTRONAUTICS

ENGR 6421 Standards, Regulations and Certification
ENGR 6441 Materials Engineering for Aerospace
ENGR 6461 Avionic Navigation Systems
ENGR 6471 Integration of Avionics Systems (*)
ENGR 6951 Seminar on Space Studies
ENGR 7201 Micro-gravity Fluid Dynamics
ENGR 7461 Avionic Systems Design
ENGR 7961 Industrial "Stage" and Training
MECH 6091 Flight Control Systems
MECH 6111 Gas Dynamics (*)
MECH 6121 Aerodynamics (*)
MECH 6161 Gas Turbine Design (*)
MECH 6171 Turbomachinery and Propulsion (*)
MECH 6231 Helicopter Flight Dynamics
MECH 6241 Operational Performance of Aircraft
MECH 6251 Space Flight Mechanics and Propulsion Systems
MECH 6471 Aircraft Stuctures
MECH 6941 Concurrent Engineering in Aerospace Systems
MECH 6961 Aerospace Case Study I
MECH 6971 Aerospace Case Study II

E12 - INDUSTRIAL ENGINEERING

INDU 6111 Theory of Operations Research
INDU 6121 Advanced Operations Research (*)
INDU 6131 Graph Theory with System Applications
INDU 6211 Production Systems and Inventory Control
INDU 6221 Lean Enterprise
INDU 6231 Scheduling Theory
INDU 6241 Lean Manufacturing
INDU 6311 Discreet System Simulation
INDU 6331 Advanced Quality Control
INDU 6341 Advanced Concepts in Quality Improvement (*)
INDU 6351 System Reliability
INDU 6411 Human Factors Engineering (*)
INDU 6421 Occupational Safety Engineering (*)

E21 - INTEGRATIVE STUDIES FOR BUILDING ENGINEERING

BLDG 6111 Computer-Aided Building Operation
BLDG 6151 Database Applications in Building and Civil Engineering
BLDG 6221 Design of Computer Aided Systems in Building and Civil Engineering
BLDG 6231 Applications of Artificial Intelligence in Building and Civil Engineering
BLDG 6541 Heat Transfer (**)
BLDG 6561 Building Economics I (**)
BLDG 6571 Project Management
BLDG 6581 Decision Analysis
BLDG 6591 Computer-Aided Building Design (*)
BLDG 6631 Fundamentals of Facility Management
BLDG 6861 Simulations and Design of Construction Operations
BLDG 7511 Integrated Building Design

E22 - BUILDING SCIENCE

BLDG 6601 Building Enclosure (*)
BLDG 6611 Building Science (**)
BLDG 6621 Modern Building Materials (*)
BLDG 6641 Industrialized Building
BLDG 6651 Fire and Smoke Control in Buildings (*)
BLDG 6661 Hydrothermal Performance of the Building Envelope
BLDG 6671 Diagnostics and Rehabilitation of Building Envelope
BLDG 7601 Durability of Building Materials

E23 - BUILDING ENVIRONMENT

BLDG 6701 Building Environment
BLDG 6711 Mechanical Systems in Building
BLDG 6721 Building Acoustics (*)
BLDG 6731 Building Illumination (*)
BLDG 6741 HVAC Control Systems
BLDG 6751 Indoor Air Quality and Ventilation (*)
BLDG 6761 Intelligent Buildings
BLDG 6781 Energy Management in Buildings
BLDG 6791 Thermal Building Simulation
BLDG 7401 Dispersion of Building Exhaust

E24 - CONSTRUCTION MANAGEMENT

BLDG 6801 Construction Planning and Control
BLDG 6811 Labour and Industrial Relations in Construction (*)
BLDG 6821 Legal issues in Construction (*)
BLDG 6831 Construction Processes (*)
BLDG 6851 Project Cost Estimating
BLDG 6921 Trenchless Technology for Rehabilitation Works
BLDG 7811 Project Acquisition and Control
BLDG 7831 Building Economics II
BLDG 7841 Information Technology Applications in Construction
BLDG 7861 Business Practices in Construction
BLDG 7871 Construction Equipment Management

E31 - STRUCTURAL ENGINEERING

BLDG 6061 Structural Systems for Buildings
BLDG 6071 Wind Engineering and Building Aerodynamics
BLDG 6931 Infrastructure Rehabilitation
CIVI 6001 Advanced Reinforced Concrete
CIVI 6011 Pre-cast and Pre-stressed Concrete Structures
CIVI 6051 Design of Industrial Structures
CIVI 6061 Structural Health Monitoring
CIVI 7001 Earthquake Engineering
CIVI 7031 Dynamics of Foundations

E32 - BRIDGE ENGINEERING

CIVI 6101 Planning and Design of Bridges
CIVI 7101 Theory and Design of Orthotropic Bridges
CIVI 7111 Theory and Design of Modern Bridge Systems
CIVI 7121 Cable Stayed Bridges

E33 - WATER RESOURCES

CIVI 6301 Hydrology (*)
CIVI 6331 Hydraulic Engineering
CIVI 6381 Hydraulic Structures
CIVI 7311 Groundwater Flow

E34 - URBAN TRANSPORTATION

CIVI 6401 Transportation Systems Analysis
CIVI 6411 Urban Transportation Planning (*)
CIVI 6441 Traffic Engineering (*)
CIVI 6451 Pavement Design
CIVI 7401 Design of Transportation Terminals

E35 - GEOTECHNICAL ENGINEERING

CIVI 6501 Foundation Engineering
CIVI 6511 Earth Structures and Slope Stability
CIVI 6521 Soil Behaviour
CIVI 6531 Soil Testing and Properties
CIVI 6541 Reinforced Earth

E36 - INDUSTRIAL WASTE MANAGEMENT

CIVI 6481 Hazardous Waste Management
CIVI 6491 Engineering Aspects of Site Remediation
CIVI 6631 Transportation of Hazardous Materials and Wastes
CIVI 6661 Environmental Impact Assessment
CIVI 6671 Fate and Transport of Contaminants in the Environment

E37 - ENVIRONMENTAL ENGINEERING

CIVI 6601 Modeling Aspects of Environmental Systems
CIVI 6611 Environmental Engineering
CIVI 6621 Engineering Aspects of Biological Treatment for Air and Water
CIVI 6641 Unit Operations in Environmental Engineering
CIVI 6651 Water Pollution and Control
CIVI 6901 Selected Topics in Civil Engineering I

E42 - COMMUNICATIONS

ELEC 6111 Detection and Estimation Theory
ELEC 6121 Spread Spectrum Communications
ELEC 6131 Error Detecting and Correcting Codes
ELEC 6141 Wireless Communications
ELEC 6151 Information Theory and Source Coding
ELEC 6171 Modeling and Analysis of Telecommunications Networks
ELEC 6181 Real-time and Multimedia Communication over Internet
ELEC 6831 Digital Communications I
ELEC 6841 Digital Communications II
ELEC 6851 Introduction to Telecommunications Networks
ELEC 6861 Higher Layer Telecommunications Protocols
ELEC 6871 Fiber-Optics Communication Systems and Networks
ELEC 6881 Fundamentals and Applications of MIMO Communications
ELEC 7151 Broadband Communications Networks
ENCS 6811 Optical Networking: Architectures and Protocols

E43 - MICRO-DEVICES AND FABRICATION PROCESSES

ELEC 6221 Solid State Devices 9 (*)
ELEC 6231 Design of Integrated Circuit Components (*)
ELEC 6241 VLSI Process Technology (*)
ELEC 6251 Microtransducer Process Technology
ELEC 6261 Optical Devices for High-Speed Communications
ELEC 6271 Nanoscience and Nanotechnology: Opto-Electronic Devices
ELEC 6281 Principles of Solid State Nanodevices

E44 - FIELDS, WAVES AND OPTOELECTRONICS

ELEC 6301 Advanced Electromagnetics
ELEC 6311 Radiation and Scattering of Waves

ELEC 6341 Antennas (*)
ELEC 6351 Modern Antenna Theory
ELEC 6361 Acoustics (*)
ELEC 6371 Design of Wireless RF Systems
ELEC 6381 Techniques in Electromagnetic Compatibility
ELEC 6391 Microwave Engineering (*)

E45 - ELECTRICAL POWER ENGINEERING

ELEC 6411 Power Electronics I (*)
ELEC 6461 Power Electronics II
ELEC 6471 Hybrid Electric Vehicle Power System Design and Control (*)
ELEC 6481 Computer-aided Analysis of Power Electronic Systems
ELEC 6491 Controlled Electric Drives
ELEC 7441 Design of Power Electronic Circuits
ELEC 7451 Power System Compensation

E47 - SIGNAL PROCESSING

ELEC 6601 Digital Signal Processing
ELEC 6611 Digital Filters
ELEC 6621 Digital Waveform Compression
ELEC 6631 Digital Video Processing
ELEC 6641 Two-dimensional Signal and Image Processing
ELEC 6651 Adaptive Signal Processing

E48 - COMPUTER ENGINEERING

COEN 6311 Software Engineering
COEN 6312 Model-Driven Software Engineering
COEN 6321 Applied Genetic and Evolutionary Systems
COEN 6331 Neural Networks
COEN 6611 Real-time Systems
COEN 6711 Microprocessors and Their Applications
COEN 6721 Fault-Tolerant Distributed Systems
COEN 6741 Computer Architecture and Design
COEN 7311 Protocol Design and Validation
COEN 7741 Advanced Computer Architecture

E51 - INDUSTRIAL CONTROL AND AUTOMATION

MECH 6011 Analysis and Design of Pneumatic Systems
MECH 6021 Design of Industrial Control Systems (*)
MECH 6041 Virtual Systems Engineering
MECH 6051 Process Dynamics and Control (*)
MECH 6061 Analysis and Design of Hydraulic Control Systems (*)
MECH 6081 Fuel Control Systems for Combustion Engines
MECH 6621 Microprocessors and Applications (*)
MECH 6631 Industrial Automation
MECH 7011 Dynamics of Hydraulics Control Systems

E52 - THERMODYNAMICS AND HEAT TRANSFER

MECH 6101 Kinetic Theory of Gases
MECH 6131 Conduction and Radiation Heat Transfer
MECH 6141 Heat Exchanger Design
MECH 6181 Heating, Air Conditioning and Ventilation (*)
MECH 6191 Combustion
MECH 7101 Convection Heat Transfer

E53 - MACHINE DESIGN AND PRODUCTION

ENGR 6161 Sensors and Actuators
ENGR 6371 Micromechatronic Systems and Applications
MECH 6421 Metal Machining and Surface Technology
MECH 6431 Introduction to Tribology (Wear, Friction and Lubrication)
MECH 6441 Stress Analysis in Mechanical Design
MECH 6451 Computer-Aided Mechanical Design
MECH 6481 Aeroelasticity
MECH 6491 Engineering Metrology and Measurement Systems
MECH 6641 Engineering Fracture Mechanics and Fatigue
MECH 6671 Finite Element Method in Machine Design
MECH 6691 Optical Microsystems

E54 - MATERIALS ENGINEERING AND PROCESSING

MECH 6511 Mechanical Forming of Metals (*)
MECH 6531 Casting

MECH 6541 Joining Processes and Nondestructive Testing
MECH 6551 Fracture
MECH 6561 High Strength Materials
MECH 6571 Corrosion and Oxidation of Metals
MECH 6661 Thermodynamics and Phase Equilibria of Materials

E56 - GROUND VEHICLE DYNAMICS

MECH 6741 Mechatronics (*)
MECH 6751 Vehicle Dynamics (*)
MECH 6761 Vehicular Internal Combustion Engines (*)
MECH 6771 Driverless Ground Vehicles (*)
MECH 6781 Guided Vehicle Systems (*)
MECH 7511 Vehicle Vibration and Control
MECH 7711 Handling and Stability of Road Vehicles

E57 - COMPOSITE MATERIALS

MECH 6501 Advanced Materials
MECH 6521 Manufacturing of Composites
MECH 6581 Mechanical Behaviour of Polymer Composite Materials
MECH 6601 Testing and Evaluation of Polymer Composite Materials and Structures
MECH 6651 Structural Composites
MECH 7501 Design Using Composite Materials

E61 - DOCTORAL/PhD SEMINAR

BLDG 8011 Doctoral Seminar in Building Engineering (***)
CIVI 8011 Doctoral Seminar in Civil Engineering (***)
ELEC 8011 Doctoral Seminar in Electrical Engineering (***)
MECH 8011 Doctoral Seminar in Mechanical Engineering (***)
ENCS 8011 PhD Seminar (****)

E62 - THESIS AND COMPREHENSIVE EXAMINATION

ENCS 8501 Comprehensive Examination
ENCS 8511 Doctoral Research Proposal
ENGR 8901 Master of Applied Science Research and Thesis (29 credits)

ENGR 8911 Doctoral Research and Thesis
INSE 8901 Master of Applied Science Research and Thesis (25 credits)

E63 - PROJECT, REPORT AND INDUSTRIAL TRAINING

ENCS 6931 Industrial Stage and Training
ELEC 6961 Graduate Seminar in Electrical and Computer Engineering
INSE 6961 Graduate Seminar in Information and Systems Engineering
ENGR 6971 Project and Report I
ENGR 6981 Project and Report II
ENGR 6991 Project and Report III

E66 - SYSTEMS ENGINEERING

INSE 6311 Sustainable Infrastructure Planning and Management Systems
INSE 6400 Principles of Systems Engineering
INSE 6411 Product Design Theory and Methodology
INSE 6421 Systems Integration and Testing
INSE 6431 Ad Hoc Wireless Networks: Architectures and Protocols

E67 - 3D GRAPHICS AND INTELLIGENT SYSTEMS

INSE 6510 Video Game Technology and Development
INSE 6530 3D Graphics and Computer Animation for Game Design

E68 - QUALITY SYSTEMS ENGINEERING

INSE 6210 Total Quality Methodologies in Engineering
INSE 6220 Advanced Statistical Approaches to Quality
INSE 6230 Total Quality Project Management
INSE 6240 Executive Communication
INSE 6250 Quality Methodologies for Software
INSE 6260 Software Quality Assurance
INSE 6270 Quality-Based Systems Engineering
INSE 6280 Quality Assurance for Systems Engineering
INSE 6290 Quality in Supply Chain Design
INSE 6300 Quality Assurance in Supply Chain Management
INSE 6310 Systems Engineering Maintenance Management

E69 - INFORMATION SYSTEMS SECURITY

INSE 6110 Foundation of Cryptography
INSE 6120 Crypto-Protocol and Network Security
INSE 6130 Operating Systems Security
INSE 6140 Malware Defenses and Application Security
INSE 6150 Security Evaluation Methodologies
INSE 6160 Database Security and Privacy
INSE 6170 Network Security Architecture and Management
INSE 6180 Security and Privacy Implications of Data Mining
INSE 6190 Wireless Network Security
INSE 6610 Cybercrime Investigations
INSE 6620 Cloud Computing Security and Privacy
INSE 6630 Recent Developments in Information Systems Security
INSE 6640 Smart Grids and Control System Security
INSE 6650 Trusted Computing

E70 - INFORMATION SYSTEMS ENGINEERING

INSE 6100 Advanced Java Platforms
INSE 6320 Risk Analysis for Information and Systems Engineering
INSE 6441 Applied Game Theory and Mechanism Design
INSE 7100 Design and Analysis of Security Protocols
INSE 7110 Value Added Service Engineering in Next Generation Networks
INSE 7120 Advanced Network Management

E71 - COMPUTER SCIENCE PROGRAM

COMP 6731 Pattern Recognition (*)
COMP 6741 Intelligent Systems (*)
COMP 7651 Advanced Analysis of Algorithms

E72 - BUSINESS ADMINISTRATION PROGRAM

MBA 607 Financial Accounting for Managerial Decisions
MBA 608 Managerial Statistics
MBA 614 Financial Management
MBA 616 Operations Management
MBA 628 Management Accounting

F03 - APPLICATION SPECIFIC INTEGRATED

COEN 6501 Digital System Design and Synthesis
COEN 6511 VLSI Circuit Design
COEN 6521 Design for Testability
COEN 6531 ASIC Synthesis
COEN 7501 Formal Hardware Verification
ELEC 6051 Introduction to Analog VLSI
ELEC 6071 Analog VLSI Techniques for Signal Processing
ELEC 6081 Modern Analog Filter Design

(*) Cross-listed courses
(***) Available only to students admitted prior to September 1997.
(****) Students admitted prior to September 1997 are not allowed to substitute ENCS 8011 for an equivalent course work.

Engineering Course Descriptions

Building Engineering

BCEE 6961 Graduate Seminar in Building and Civil Engineering (1 credit)
MEng students must attend a set of seminars identified by the Department and submit a comprehensive report on selected topics. The report, including an abstract, must be suitably documented and illustrated, should be at least 1000 words in length, must be typewritten on one side of 21.5 cm by 28 cm white paper of quality, and must be enclosed in binding. Students are referred to *Form and Style: Thesis, Reports, Term Papers, fourth edition by Campbell and Ballou,* published by Houghton Mifflin.
Note: This course cannot be taken by MASc or PhD students.

BLDG 6061 Structural Systems for Buildings (4 credits)
Building components and assembled systems. Structural efficiency and economy: rigid frames, shear walls, framed tube, latticed structures; membrane, air and cable supported structures. Selection and preliminary design of building structural systems, materials and components. Case studies.

BLDG 6071 Wind Engineering and Building Aerodynamics (4 credits)
Atmospheric circulations; atmospheric boundary layer; wind structure; wind speed and turbulence measurements; bluff body aerodynamics; mean and fluctuating wind forces on buildings; internal wind pressures; along-wind, across-wind and torsional building response to wind; snow drifting and accumulation problems; dispersion of gaseous pollutants. A case study or a project.

BLDG 6111 Computer-Aided Building Operation (4 credits)
Prerequisite: BLDG 6711.

Computer systems for energy management, including scheduling and operation of HVAC systems and lighting. Applications for intelligent buildings. Use of simulation and knowledge-based software for automatic regulation of building operation. Diagnosis of malfunctions and modifications of operations. Computerized building security systems. Actions during extraordinary conditions such as fire emergencies. A project.

BLDG 6151 Database Applications in Building and Civil Engineering (4 credits)
Components, properties and limits of databases and database management systems (DBMS). Database requirements for engineering tasks. Design of database schema and implementation in commercially available DBMS. Engineering data modeling techniques. Topics include: the entity/relationship model; the relational data model; the standard database language SQL; and the object-oriented data model. A project.
Note: Students who have taken ENGR 6151 may not take this course for credit.

BLDG 6221 Design of Computer-Aided Systems in Building and Civil Engineering (4 credits)
Object-oriented modeling of physical components, design objectives, performance requirements and engineering processes. Identification of objects and definition of their arrangement and interaction to model engineering processes. Overview of the life-cycle of an engineering software project. Project on implementation of a small scale computer-aided engineering system.
Note: Students who have taken ENGR 6221 may not take this course for credit.

BLDG 6231 Applications of Artificial Intelligence in Building and Civil Engineering (4 credits)
Introduction to artificial intelligence techniques in an engineering context; heuristic search methods, logical reasoning, knowledge-based systems, neural networks, genetics algorithms, and case-based reasoning. Algorithmic versus knowledge-based programming for engineering applications. Emphasis on knowledge-based systems and their characteristics, capabilities and limitations. Case studies in design, failure diagnosis and processing of standards. A project.
Note: Students who have taken ENGR 6231 may not take this course for credit.

BLDG 6541 Heat Transfer (4 credits)
(Cannot be taken for credit by students who have completed the Bachelor of/Baccalaureate in Engineering (Building) Program).
Steady state heat conduction. Convection and radiation heat exchange. Refrigeration cycles. Theory of air vapour mixtures. Introduction to heat transfer in building environment. Unsteady state of heat transfer. Case studies.

BLDG 6561 Building Economics I (4 credits)
(Cannot be taken for credit by students who have completed the Bachelor of/Baccalaureate in Engineering (Building) Program).
Development of economic performance measures of interest to developers, owners, contractors and users. Sources of finance and the determinants of the cost of money. Elementary estimating; cost indices;

forecasting techniques; value of money; economic comparison techniques; evaluation of projects in private and public sectors; tax regulations; inflation; life-cycle costing; risk analysis; non-economic attributes. Case studies of economic analysis of projects, single building and building components. A project.

BLDG 6571 Project Management (4 credits)
Introduction to managing the development, design and construction of buildings. Examination of project management for the total development process, including inter-relationships between owners, developers, financing sources, designers, contractors and users; methods of project delivery; introduction to planning and scheduling; role and tasks of the project manager; feasibility analyses; construction claims; financing and cash-flow analysis; government regulations; environmental and social constraints; introduction to control of cost, time and technical performance; human factors; computer applications. A project.

BLDG 6581 Decision Analysis (4 credits)
Development of a basic theory of decision making under uncertainty. Rationales of decision makers, utility, the concept of the value of perfect information. The Bayesian approach to decision making; pre-posterior analysis and optimal fixed-sized analysis for random processes. Decision analysis with multiple objective, structuring the problem, multi-attributed utility functions, case studies. A project.

BLDG 6591 Computer-Aided Building Design (*) (4 credits)
Prerequisites: BLDG 6561.
Identification of objectives, decision variables, processes and information flow in building design. Application and evaluation of computer systems to components of the building design process. Determination of decision variables in problem modelling and sensitivity of results. Current applications in structural analysis and design, space layout, electrical distribution systems, HVAC design, lighting design, estimating, specification editing and scheduling. Evaluation of issues of interdisciplinary information control and interchange. A project.

BLDG 6601 Building Enclosure (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
Prerequisite: BLDG 6611.
Schematic and detail design of walls, windows and roofs. Complex building types will be examined to show the relationships between massing, materials, energy conservation and building use. Solar shading, daylighting, rainscreen and air barrier principles will be emphasized. A project.

BLDG 6611 Building Science (4 credits)
(Cannot be taken for credit by students who have completed the Bachelor of/Baccalaureate in Engineering (Building) Program).
Environmental exterior and interior influences on inner environmental control. Topics include: thermal

energy exchanges, psychrometrics, vapour and fluid flow, air leakage, ventilation and design comfort conditions, selection of materials and building systems. A case study or a project.

BLDG 6621 Modern Building Materials (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
Prerequisite: BLDG 6611 previously or concurrently.
Structural, thermal and acoustical properties of new building materials such as: plastics, synthetic fibres, adhesives, sealants, caulking compounds, forams, sandwich panels, composites, polymer-concrete systems, fibre-reinforced concretes, plastic mortars, polymers for flooring, roofing, synthetic wall papers. Consideration of corrosion, bio- and thermal degradation, stability under ultraviolet and solar radiation. A project.

BLDG 6631 Fundamentals of Facility Management (4 credits)
Systems approach to planning, organization and implementation of a facility, including space allocation, leasing and marketing, operation, maintenance, and renovation over the life of the building. Forecast of budget requirements for effective operation, maintenance, and renovation. Correlation between the operation of the building and health risks, comfort, productivity, and costs. Integrated approach to the planning, analysis, evaluation, organization and optimization of physical systems of facilities. Case studies.

BLDG 6641 Industrialized Building (4 credits)
Trends toward off-site fabrication of buildings. Needs and technical requirements of international markets. Principal types of industrialized systems, materials and components. Optimization of industrialized production. Planning, design, construction and maintenance. Codes and standards. A case study and project.

BLDG 6651 Fire and Smoke Control in Buildings (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
Prerequisite: BLDG 6611.
Topics treated include: fire and smoke control; failure mechanisms of building enclosure, illustrated by case studies; performance codes for enclosure systems; enclosure design for extreme operation environments. A project.

BLDG 6661 Hygrothermal Performance of the Building Envelope (4 credits)
Prerequisite: BLDG 6611 previously or concurrently.
Modelling of dynamic building envelope thermal performance. Thermal bridges. Modeling of transient moisture transfer, condensation and accumulation. Advanced glazings and evaluation of window performance. Active building envelope components for heat and moisture control. Experimental techniques for performance evaluation of the building envelope; infrared thermography, guarded hot box and calibrated hot box tests. A project.

BLDG 6671 Diagnostics and Rehabilitation of Building Envelope (4 credits)
Failures in building envelopes. Modes of deterioration including freeze-thaw, chemical, movements. Diagnostics and investigation techniques including field survey instruments. Assessment of intervention magnitude and performance of proposed solutions. Codes, standards and regulations. Case studies.

BLDG 6701 Building Environment (4 credits)
Design criteria of indoor environment. Assessment of thermal comfort and sensation. Mathematical models of thermal comfort: predictive models and adaptive models. Prediction of thermal sensation using: computer simulation, and measurements with thermal comfort meter. Verification of compliance with standards. Visual comfort. Standards for quality of visual environment. Calculation of photometric parameters. Preliminary design of the indoor lighting system. Evaluation of illuminance level using commercially available software packages. Acoustical comfort. Standards for quality of acoustical environment. Sound control measures through the design of buildings and HVAC systems. Two projects.

BLDG 6711 Mechanical Systems in Building (4 credits)
Co-requisite: BLDG 6701.
HVAC Systems. Analysis, selection and operation; design of air and water distribution systems in buildings; waste water disposal and sprinkler systems. A project.

BLDG 6721 Building Acoustics (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
An understanding of sound and an examination of the major factors which contribute to a controlled acoustic environment in buildings. Topics covered include: basic vibration, sources, measurement and description of environmental noise, psychological and physiological aspects of sound perception; sound transmission through building elements; reverberation, measurement and control; and room acoustics. Case studies and a project.

BLDG 6731 Building Illumination (*) (4 credits)
Quantitative and qualitative aspects of illumination systems. Photometric quantities, visual perception and colour theory, standards, daylight and artificial illumination systems, radiative transfer. Fixture and lamp characteristics, control devices for improved energy efficiency. Design of advanced fenestration systems for daylighting. Field measurements and artificial sky tests. Virtual reality and other computer simulation techniques for lighting. A project.

BLDG 6741 HVAC Control Systems (4 credits)
HVAC control loops: classification and structure, specifications, hardware, tuning and testing. Optimization of single- and multi-loop control systems. Energy management systems for monitoring, control and diagnostics of HVAC system operation. A project.

BLDG 6751 Indoor Air Quality and Ventilation (*) (4 credits)
History and development of indoor air science. Relevant national and provincial standards and regulations. Principles of occupational hygiene; identification, evaluation and control of physical, biological, and chemical agents in indoor environment. Ventilation requirements. Definition of ventilation efficiency and removal effectiveness; measurement techniques and modelling. Indoor air monitoring; field studies of gases, fumes, solvents, and dusts. Plan for building walkthrough evaluations; strategies for improving indoor air quality. Building design for acceptable indoor air quality, material selection and specification. A case study or project.

BLDG 6761 Intelligent Buildings (4 credits)
Issues related to the Intelligent Building; automation, communication and security. Mechanical, electrical, electronic subsystems and their integration within the building; configuration and operational characteristics; performance specifications; analytical models; design methods; case studies. A project.

BLDG 6781 Energy Management in Buildings (4 credits)
Prerequisite: BLDG 6611 previously or concurrently.
Energy-related standards, codes and by-laws. Methods of assessment of the actual energy performance. Conventional and innovative measurement and analysis techniques. Energy-oriented renovation or replacement of building sub-systems (e.g. HVAC and lighting systems). Prediction of energy and cost savings using commercially available software packages. Verification of compliance with standards. Life cycle analysis. A case study and project.

BLDG 6791 Thermal Building Simulation (4 credits)
Prerequisite: BLDG 6611.
Mathematical models of heat and mass transfer phenomena through building components: transfer function methods and numerical methods. Models of radiative and convective heat transfer phenomena within buildings. Application to equipment-based modelling of HVAC systems: first principle models and correlation-based models. System-based modelling of HVAC systems. Validation of computer models. A project.

BLDG 6801 Construction Planning and Control (4 credits)
Prerequisite: BLDG 6571.
Methods of delivering construction. Contractual relationships and organizational structures. Phases of project development. Estimating resource requirements; costs and durations. Bidding strategies. Network analysis using CPM and PERT, time-cost trade-off, resource allocation. Cash flow analysis. Earned-value concept for integrated time and cost control. Quality control. Value engineering. A case study and project.

BLDG 6811 Labour and Industrial Relations in Construction (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
The study of labour legislation with special emphasis on the construction industry, union organization, the

theory and practice of negotiations, mediation, contract administration and arbitration. Review of actual contracts, discussion of future trends. Case studies.

BLDG 6821 Legal Issues in Construction (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
Legal concepts and processes applicable to the development of constructed facilities and to the operation of the construction firm. Emphasis on Quebec law and institutions. Case studies.

BLDG 6831 Construction Processes (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
A study of current construction methods and techniques. The subjects include wood framing, masonry, concrete forming, slipforming, precast construction, industrialized building, deep excavation shoring and underpinning. The methods are described in terms of materials involved, equipment required, current field practice and safety considerations. Case studies.

BLDG 6851 Project Cost Estimating (4 credits)
Techniques and procedures used for estimating cost of construction projects. Topics include: cost estimation process; elements of project cost; conceptual and detailed cost estimation methods; risk assessment and range estimating; case studies; computer-aided estimating. A project.

BLDG 6861 Simulations and Design of Construction Operations (4 credits)
Prerequisite: BLDG 6831.
Principles of modelling and simulation. Classification and validation of simulation models. Analysis of input data and outputs. Object Oriented Simulation (OOS). Simulation languages. Application of discrete event simulation in construction operations including earthmoving operations, building construction operations, and tunneling operations. A project.

BLDG 691 Topics in Building Engineering I (4 credits)
Note: Subject matter will vary from term to term and from year to year. Students may re-register for these courses, providing that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g. CIVI 691A, CIVI 691B, etc.

BLDG 6921 Trenchless Technology for Rehabilitation Works (4 credits)
State of Canadian urban infrastructure with a focus on underground facilities; current industry practice; common types of defects in underground pipes; diagnostics of defects and evaluation techniques for the conditions of water and sewer mains; planning, equipment, materials and methods for rehabilitation of water and sewer mains; case studies.
Note: Students who have taken ENGR 6721 may not take this course for credit.

BLDG 6931 Infrastructure Rehabilitation (4 credits)
State of Canadian urban infrastructure. Rehabilitation techniques as applicable to steel and concrete structures; degradation mechanisms; detection and classification of defects. Evaluation and assessment of the conditions of buildings and bridges. Rehabilitation materials and methods. Codes and guidelines. Case studies.
Note: Students who have taken ENGR 6731 may not take this course for credit.

BLDG 6951 Passive Solar Building Design (4 credits)
Prerequisite: BLDG 6611.
Design principles of solar buildings, including direct gain, indirect gain and solaria. Analytical and computer models of passive systems. Performance of glazing systems, transparent insulation, and airflow windows. Building-integrated photovoltaic systems. Thermal storage sizing for solar energy storage; phase-change thermal storage. Thermosyphon collectors. Prevention of overheating, shading systems and natural ventilation. A project.
Note: Students who have taken ENGR 6651 may not take this course for credit.

BLDG 7401 Dispersion of Building Exhaust (4 credits)
Prerequisite: BLDG 6611.
Atmospheric parameters, wind velocity profiles, meteorological data. Gaussian dispersion equations. Plume rise and trajectories. Evaluation of stack gas plume dispersion. Trapped plumes; Turner's approximation. Potential reingestion of building exhaust. Analytical, numerical and experimental modelling of dispersion process; design guidelines fumigation. A case study or a project.

BLDG 7511 Integrated Building Design (4 credits)
Prerequisites: BLDG 6601 and BLDG 6711.
Compatibility among building subsystems (structural, envelope, mechanical, lighting, materials) and between the building and the environment. Integration issues in the design, production and operation of the built facility. Case studies of failures caused by lack of compatibility. Consideration for tolerances and sustainable development. A project.

BLDG 7521 Advanced Computer-Aided Building Design (4 credits)
Prerequisite: BLDG 6231.
Characteristics of the building design process. Traditional versus emerging roles of computers pertaining to building design activities. Preliminary design and integrated design issues: analysis with incomplete/imprecise data, automatic sizing and checking based on Standards, interfaces between CAD and analysis routines, communications across disciplines and through design stages, standardization. Applications involving operations research techniques, KBS and analysis packages for engineering performance evaluation. A project.

BLDG 7601 Durability of Building Materials (4 credits)
Prerequisite: BLDG 6611 or equivalent.
Concepts underlying long-term performance of building materials such as: ceramics, stucco and synthetic stucco, lightweight concrete, wood and wood-based products, thermal insulation, selected composite materials, sealants, membranes used for waterproofing and air barriers. Methods of fabrication, properties and evaluation for durability. Failure mechanisms under combined actions of mechanical and environmental loads (temperature, moisture, freeze-thaw, solar radiation, salt solutions, air pollution, and microorganisms). A case study and project.

BLDG 7811 Project Acquisition and Control (4 credits)
Prerequisite: BLDG 6571, 6801.
Study of techniques and procedures used for construction project procurement and control. Topics treated include: marketing, bidding strategies, work break-down structure and contract packages, techniques for integrated time and cost control; management information systems for control, procurement; productivity measurement, contingency and escalation analysis and control. A project.

BLDG 7831 Building Economics II (4 credits)
Prerequisite: BLDG 6561, 6581.
Topics include: replacement analysis; risk analysis of projects; sensitivity analysis; forecasting techniques, profitability analysis; multi-attributed decision analysis, case studies. A project.

BLDG 7841 Information Technology Applications in Construction (4 credits)
Prerequisite: BLDG 7811.
Use of computers in estimating, cost engineering, scheduling and resource analyses, materials control, report generation and operations simulation. Information systems: information-based theories of management; information technology, cost and value information; analysis, design and implementation of a network based control system. Considerations for computer usage in construction firms; hardware, software, operations, economic, human and organizational. Product and process modelling; Internet use in product delivery. A project.

BLDG 7861 Business Practices in Construction (4 credits)
Prerequisite: BLDG 6801.
A study of business practices as they relate to the construction industry. Topics treated include: organization; marketing; bid preparation; bonding; personnel management; financing; accounting; cash-flow analysis; capital budgeting. The principles are first presented and then followed by case studies. A project.

BLDG 7871 Construction Equipment Management (4 credits)
Prerequisite: BLDG 6561.
The study of various classes of equipment, (cranes, excavators, loaders, tractors, etc.) used in construction.

Methods are developed for selecting, acquiring, maintaining and replacing equipment. Treatment of simulation and its use for the optimal selection of equipment spreads. A project.

BLDG 791 Topics in Building Engineering II (4 credits)
Note: Subject matter will vary from term to term and from year to year. Students may re-register for these courses, providing that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g. CIVI 691A, CIVI 691B, etc.

BLDG 8011 Doctoral Seminar in Building Engineering
Grading on a pass/fail basis only. No credit value.

Civil Engineering

CIVI 6001 Advanced Reinforced Concrete (4 credits)
Strength limits; modes of failure; flexural and inclined cracking strength; crack propagation; crack width; deformation; biaxial and multiaxial strength of concrete; ultimate strength in flexure; ultimate strength in diagonal splitting; ultimate strength of columns; current research progress and modelling for finite element analysis; new code regulations. A project.

CIVI 6011 Precast and Prestressed Concrete Structures (4 credits)
Prefabrication and prestressing concepts; segmental and modular structures and connections; composite and pre-and post-tensioned structures; analysis and design of determinate and indeterminate systems; design codes. A project.

CIVI 6051 Design of Industrial Structures (4 credits)
Problems in the design of industrial structures in steel, reinforced concrete, masonry, and timber; rejuvenation and expansion of existing plant facilities; design of bracing systems, foundations, silos and liquid storage tanks; connections, standard details and codes. A case study and project.

CIVI 6061 Structural Health Monitoring (4 Credits)
Review of the current state of infrastructure including bridges, dams, pipelines as well as buildings. Components of civil infrastructure including smart and innovative structures. Structural Health Monitoring (SHM): principles, techniques, implementation, interdisciplinary approach, advantages and challenges. SHM systems: component and system design, sensors and instrumentation, data acquisition, data management, interpretation of SHM data, assessment of structural condition, and decision making. Damage detection methods: local and global, analytical and experimental, non-destructive evaluation, vibration based damage identification. Field applications. A project.

CIVI 6101 Planning and Design of Bridges (4 credits)
History and development of bridges; basic parameters; material, system and geometry; selection of location and optimum proportioning of different structural types; selection and design of steel and concrete highway and railway bridge structures based on requirements of economics; maintenance, aesthetics and safety; modern trends in bridge design and construction; analysis of existing bridges; numerical examples. A project.

CIVI 6301 Hydrology (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
Weather elements; precipitation, stage-discharge relations; evapo-transpiration; ground water flow, method of images; streamflow hydrograph, unit hydrograph and its applications, synthetic hydrographs; laminar flow; hydrologic routing; instantaneous hydrography; hydraulic routing, method of characteristics, kinematic routing; statistical analysis, confidence intervals, stochastic generator, auto-regressive model; applications of hydrology. A case study and a project.

CIVI 6331 Hydraulic Engineering (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
Development of surface water resources; basic measurements in hydraulic engineering; storage reservoirs; practical problems; run-off characteristics of natural streams; control structures; economic analysis; energy dissipators; sediment transportation; transitions; elements of river engineering; navigation; control of floods. A case study and a project.

CIVI 6381 Hydraulic Structures (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
Design of storage dams; characteristics of spillways and other outlet works; design of control structures; principles and design of flow measuring structures; special topics. A project.

CIVI 6401 Transportation Systems Analysis (4 credits)
Aspects of probability and statistics as applied to transportation; network theory; system operations and safety management; applications of optimization and decision theory to selection of alternative systems and facility location; evaluation of traffic control devices; signal timing plans and management strategies. A project.

CIVI 6411 Urban Transportation Planning (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
Forecasting future travel patterns; travel characteristics; systems approach to transportation planning process; land use data collection and demand analysis; trip generation; trip distribution; model and root assignment; transportation of commodities; environmental impact analysis. Computer modelling. A project.

CIVI 6441 Traffic Engineering (4 credits)
(Cannot be taken for credit by students who have completed the undergraduate equivalent).
Analysis of existing traffic flow conditions; study of traffic characteristics; volume and speed surveys; capacity-performance relations for urban streets and intersections; signal timing and coordination; traffic and environmental management; computer applications in incident detection and control; analysis and management of safety. A project.

CIVI 6451 Pavement Design (4 credits)
Components of pavement systems; materials, tests and specifications; granular and treated bases, subgrade and drainage; earthwork and soil stabilization; axle loads and stresses in pavements; design methods for flexible and rigid pavements of highways and airports; maintenance and rehabilitation; pavement management; economic requirements; design projects and computer applications. A project.

CIVI 6481 Hazardous Waste Management (4 credits)
Characterization and sources of hazardous waste; toxicological aspects of waste management; legal issues; disposal; storage; physical, chemical and biological treatments; recycling, reuse and exchange; life cycle; environmental impact management in the light of ISO 14000; "Green" product as an environmental choice; lab demonstrations. A case study and a project.

CIVI 6491 Engineering Aspects of Site Remediation (4 credits)
Physico-chemical characteristics of subsurface; soil biology; introduction to subsurface transport of contaminants; site assessment techniques; bioremediation principles and techniques; physico-chemical remediation; thermal removal; in-situ and ex-situ groundwater techniques; natural attenuation; case studies; lab demonstrations. A project.

CIVI 6501 Foundation Engineering (4 credits)
Theoretical development of bearing capacity of shallow and deep foundations, settlement analyses, design of retaining walls, sheet piles, tiebacks and caissons, dynamic analyses of pile foundations, design of machine foundations, foundations on difficult soils, construction and performance of foundations, computer applications, case histories. A project.

CIVI 6511 Earth Structures and Slope Stability (4 credits)
Design and construction of earth and rockfill dams. Seepage problems, flow nets, seepage control, soil compaction and stabilization. Computer analysis of slope stability, factor of safety. Measures taken to limit and accommodate settlements. Case studies.

CIVI 6521 Soil Behaviour (4 credits)
Drained and undrained shear strength of soils, stress-strain relationships, two and three dimensional stress

paths. Pore water pressure coefficients in saturated and partially saturated clays. One and three dimensional consolidation theories, design of sand drains, and applications. Special geotechnical problems. A project.

CIVI 6531 Soil Testing and Properties (4 credits)
Measurement and evaluation of soil consolidation, strength, and pore water pressure characteristics by means of consolidation, triaxial and direct shear tests. Application of test results to design and research problems. A project.

CIVI 6541 Reinforced Earth (4 credits)
Design of geotechnical structures reinforced with geotextiles and geogrids to improve their strength and deformation properties. Use of geonets and geomembranes to accelerate the drainage and consolidation of soil systems. Soil nailing and inclined piling to prevent downhill creep and slope failure. Analysis and design of stone columns used to support light structures and prevent instability due to soil liquefaction. A project.

CIVI 6601 Modelling in Building and Environmental Engineering (4 credits)
Continuous and discrete forms of conservation laws: mass, momentum and energy, numerical methods (finite differences, implicit and explicit schemes, finite elements). Transport of contaminants and moisture in buildings and contaminants in the environment. Modelling and measuring sources and sinks of pollutants. Computer applications to building and environmental engineering. A case study and project.

CIVI 6611 Environmental Engineering (4 credits)
Introduction to waste water treatment and control; stream pollution and control; ground water pollution; air pollution; acid rain, meteorological aspects. Noise pollution; hazardous waste disposal; solid waste management. A case study and a project.

CIVI 6621 Engineering Aspects of Biological Treatment of Water and Air (4 credits)
Introduction to aerobic/anaerobic microbial processes, design of aerobic and anaerobic systems for biological treatment of municipal, industrial and agricultural water and air pollution, design and modelling of activated sludge reactors, trickling filters, plug flow reactors, lagoons, nutrient removal, constructed wetlands, phytoremediation, biofilters, bioscrubbers, management of biosolids, lab demonstration. A case study and project.

CIVI 6631 Transportation of Hazardous Materials and Wastes (4 credits)
Transportation and Environmental systems interface; hazardous materials and wastes, accidental spills and releases, dispersion models, environmental impacts; transportation network, truck accidents related to hazardous materials and wastes, risk analysis, risk assessment models; Moore's minimum path algorithm, minimum-risk route models, determination of safe truck routes and management; Federal and Quebec regulations; project and computer applications. A case study and a project.

CIVI 6641 Unit Operations in Environmental Engineering (4 credits)
Physical and chemical principles underlying coagulation, flocculation, sedimentation, sorption, reverse osmosis, electrodialysis, ion exchange and sludge dewatering. Design and scale-up equations for clarifiers, absorption columns, filters, centrifuges, electrodialysis stacks, air components and demineralization units, lab demonstration. A case study and a project.

CIVI 6651 Water Pollution and Control (4 credits)
Physical, chemical and biological characteristics of water, water quality standards, reaction kinetics and material balances, eutrophication. Containment of reactive contaminants. Natural purification processes in water system, adsorption, absorption; diffusion and dispersion, oxidation. Large-scale transport of contaminants, single and multiple source models; modeling of transport processes, computer simulation, introduction to groundwater pollution, sea-water intrusion. A case study and a project.

CIVI 6661 Environmental Impact Assessment (*) (4 credits)
Engineering activities and the environment; environmental ethics. Prediction and estimation, statistical analysis of impact on air, water, soil quality and biological, socio-economic, cultural environments. Water and air pollution law, solid and hazardous waste laws. Applications of GIS, Environmental inventories, assessment preparation and review. Federal and provincial laws and regulations on environmental assessment. Strategies for environmental compliance, resolution of environmental conflicts. Case studies and project.

CIVI 6671 Fate and Transport of Contaminants in the Environment (4 credits)
Physical and chemical properties of organic and inorganic contaminants, air-soil-water-cycle and contaminant interactions, adsorption/desorption models, soil components in contaminant transport, influence of groundwater composition, advective flow, diffusion transport, diffusion and dispersion coefficients, partition coefficients, mechanisms and modelling of contaminant transport in soil and groundwater, environmental fate of contaminants Case studies concerning landfills, greenhouse effects, soil and groundwater interactions, nuclear waste disposal. A project.

CIVI 691 Topics in Civil Engineering I (4 credits)
Note: Subject matter will vary from term to term and from year to year. Students may re-register for these courses, providing that the course content has changed. Changes in content will be indicated by the letter following the course number. e.g. CIVI 691A, CIVI 691B, etc.

CIVI 7001 Earthquake Engineering (4 credits)
Prerequisite: ENGR 6581.
Earthquake ground motion characteristics; behaviour of buildings, bridges, etc., methods and principles of structural dynamics; inelastic action and concept of energy absorption; evaluation of damage; soil structure interaction problems; design methods and code requirements; current research. A project.

CIVI 7031 Dynamics of Foundations (4 credits)
Prerequisite: ENGR 6581.
Principles of soil dynamics; dynamic loads, theory of vibrations and design considerations for foundations of different types; shallow foundations, deep foundations, massive machine bases; problems of soil-structure interaction. A project.

CIVI 7101 Theory and Design of Orthotropic Bridges (4 credits)
Prerequisite: CIVI 6101.
Natural and technical orthotropy; orthogonally stiffened plates; methods of bridge analysis and design; materials; specifications; analysis of existing orthotropic structures; numerical examples. A project.

CIVI 7111 Theory and Design of Modern Bridge Systems (4 credits)
Prerequisite: CIVI 6101.
Hybrid, post-stressed and composite plate girders and trusses; delta type girders; orthotropic, shell types and tubular bridges, cable-stayed and stiffened cable bridges; optimization of bridge systems; vibrations and damping capacity; aerodynamics and seismic stability; concept of safety; fatigue and carrying capacity; use of models; application of computers. A project.

CIVI 7121 Cable Stayed Bridges (4 credits)
Prerequisite: CIVI 6101.
Basic bridge systems; methods of structural analysis; aerodynamic stability; structural details; typical structures. A project.

CIVI 7311 Groundwater Flow (4 credits)
Prerequisite: ENCS 6021.
Groundwater storage and supply; storage in confined aquifers; water table fluctuation; aquifers; steady groundwater hydraulics; aquifer tests and pumping. A project.

CIVI 7401 Design of Transportation Terminals (4 credits)
Prerequisite: CIVI 6401 or 6411.
Functions of transportation terminals; airports, seaports, public transit terminals; systems approach to passenger and freight terminal design; criteria for evaluating the inter-modal transfer process and user requirements. Simulation models and analytical techniques for quality of service analysis and evaluation of terminal configurations; requirements of new systems; high capacity aircraft; V/STOL aircraft, LRT and HST systems. A project.

CIVI 791 Topics in Civil Engineering II (4 credits)
Note: Subject matter will vary from term to term and from year to year. Students may re-register for these

courses, providing that the course content has changed. Changes in content will be indicated by the letter following the course number. e.g. CIVI 691A, CIVI 691B, etc.

CIVI 8011 Doctoral Seminar in Civil Engineering
Grading on a pass/fail basis only. No credit value.

Electrical and Computer Engineering

COEN 6311 Software Engineering (4 credits)
Software life cycle, software requirements and requirement documentation. Software design: top-down and bottom-up approaches; design validation and design reviews. Software implementation, choice of a programming language and portability. Testing, debugging and verification. Design of test cases. Software documentation and its maintenance. Documentation tools and documentation portability, user interface design. A project.

COEN 6312 Model-Driven Software Engineering (4 credits)
Prerequisite: COEN 6311 or COMP 6471 or equivalent.
Model-Driven Architecture (MDA), domain-based system partitioning, Platform-Independent Modeling (PIM), Platform Specific Modeling (PSM), Unified Modeling Language (UML), static and dynamic modeling with UML, UML extension mechanisms, UML profiling, Object Constraint Language (OCL), model transformation, introduction to Query/View/Transformation standard, action specification (OAL), automatic system generation. A project.

COEN 6321 Applied Genetic and Evolutionary Systems (4 credits)
Motivation for the use of genetic algorithms (GAs). Theory: the Schema Theorem, the K-armed Bandit, the Building Block Hypothesis, the Idealized GA, comparison of GAs. Methodology: representation, fitness and selection, crossover and mutation, parameterization and constraints, implementation. Applications: function optimization, evolving computer programs, optimizing a pattern recognizer, system modeling. Identification of classes of problems suitable for the use of GAs. A project.

COEN 6331 Neural Networks (4 credits)
Prerequisite: ENGR 6131.
Fundamentals of artificial neural networks; rigorous analysis of and introduction to various network paradigms: perceptrons, backpropagation, counter-propagation, Hopfield nets, bi-directional associative memories, adaptive resonance theory, cognitron and neocognitron; neural network topologies, memories, learning, stability and convergence; applications to adaptive knowledge, knowledge processing, classification, pattern recognition, signal processing, communications, robotics and control; and assessment of current neural network technology. A project.

COEN 6501 Digital System Design and Synthesis (4 credits)
This course introduces students to VHDL language and modeling digital circuit with VHDL. Topics include: arithmetic and logic circuits. Storage devices. Finite State Machines. Algorithmic State Machines. Timing issues. Asynchronous Design. VHDL and modeling with VHDL. Synthesis and architectural models for synthesis. Project involving system design and modeling. A project.

COEN 6511 VLSI Circuit Design (4 credits)
Physical design of digital circuits using technologies of Very Large Scale Integration. CMOS and BiCMOS logic blocks. CMOS processing technology, design rules, CAD issues, and limitation of CMOS technologies. Physical layouts and parasitic elements of CMOS circuits. Characterization and performance evaluation. Electrical simulation using HSPICE. Design and implementation of CMOS logic structures, interconnects, and I/O structures, emphasis on optimizing operation speed and/or power dissipation/distribution. Project of circuit design using a specified CMOS technology. A project.

COEN 6521 Design for Testability (4 credits)
Prerequisite: COEN 6501 or COEN 6511.
Stuck-at faults, observability, controllability, fault coverage, test vectors, automatic test pattern generation (ATPG), statistical fault analysis, ad-hoc testing, level sensitive scan design (LSSD), serial scan, parallel scan, signature analysis and BILBO, boundary scan, built-in-self-test (BIST), IDDQ testing. A project.

COEN 6531 ASIC Synthesis (4 credits)
Prerequisite: COEN 6501 or COEN 6511.
Introduction to high level synthesis; synthesis models. The synthesis process; High Level Description Languages; scheduling; chaining and pipelining; clock optimization and synthesis; I/O synthesis. Behavioral synthesis; architectural trade-offs in power, area and delay. Design flow with FPGAs; design flow with full-custom and semi-custom ASIC's. A project.

COEN 6611 Real-time Systems (4 credits)
Taxonomy of real-time systems; Scheduling algorithms for static and dynamic tasks; Fault-tolerance and reliability; Resource and resource access control; Multiprocessor scheduling, resource access control, and synchronization; Real-time communication, Case studies in distributed real-time systems (e.g., HARTS, MARS, Spring, etc.). A project.

COEN 6711 Microprocessors and Their Applications (4 credits)
Introduction to microprocessors and their architectures. Examples of various microprocessors. Bus and I/O Organizations. Addressing modes. Timing. Software related issues. Memory and its hierarchy. Static and dynamic memory interfacing. Synchronous and asynchronous interfacing. Interrupts. DMA. Use of Co-processors. Single chip Micro-controllers. Examples of microprocessor applications at the system level. A project.

COEN 6721 Fault-Tolerant Distributed Systems (4 credits)
Fundamentals of the design and analysis of fault-tolerant systems, Models for distributed systems, Fault/error models, Techniques for providing hardware/software redundancy, Fault-detection in multiprocessors, Stable storage, Recovery strategies for multiprocessors (checkpointing), System diagnosis, Software design faults, Experimental validation techniques, Case studies in fault-tolerant distributed systems. A project.

COEN 6741 Computer Architecture and Design (4 credits)
Review of basic computer architecture designs. Fundamentals of computer design and performance. Cost issues. Instruction set design principles. Memory hierarchies: registers, caches and virtual memories. Basic processor implementation issues. High performance computing issues such as pipelining, superscalar and vector processing. Input/output subsystem designs. A project.

COEN 691 Topics In Computer Engineering I (4 credits)
Note: Subject matter will vary from term to term and from year to year. Students may re-register for these courses, providing that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g. COEN 691A, COEN 691B, etc.

COEN 7311 Protocol Design and Validation (4 credits)
Prerequisites: COEN 6311 and ELEC 6851 or COMP 6461.
OSI model, introduction to seven layers, protocols, services. Protocol modelling techniques: FSM models, Petri net models, Hybrid models. Temporal logic. Protocol specification languages of ISO: Estelle model and language. Lotos model and language. Protocol implementation and techniques from formal specification to implementation. Protocol verification techniques: communicating FSM, reachability analysis, verification using checking, protocol design validation. Protocol performance: performance parameters, performance measurement by simulation, extensions to Estelle. Protocol testing: test architectures, test sequences, test sequence languages, test design methodology. A project.

COEN 7501 Hardware Formal Verification (4 credits)
Prerequisite: COEN 6501.
Context of formal verification in circuit design methodology. Hardware description languages. Introduction to mathematical logic (propositional, first-order, higher-order). Overview and classification of existing verification methods. Modeling hardware using Binary Decision Diagrams: BDD representations, structure and behavior modeling, advanced BDD techniques and limitations. Decision diagrams based verification: temporal logic, liveness and safety properties, model checking, automata equivalence, automated verification tools Theorem proving verification: predicate logic, abstraction techniques, structure and behavior descriptions, proof techniques and tools Case Studies: Intel Pentium FPU bug verification, Ethernet protocol verification, Cache memory coherence verification, Pipelined processor verification, ATM switch verification. A project.

COEN 7741 Advanced Computer Architecture (4 credits)
Prerequisite: COEN 6741.
Multiprocessing, Parallel processing, Vector processing, MIMD, SIMD, ILP (Instruction Level Parallelism), Superscalar, VLIW, Multithreading, Systolic processors, etc. A project.

COEN 791 Topics In Computer Engineering II (4 credits)
Note: Subject matter will vary from term to term and from year to year. Students may re-register for these courses, providing that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g. COEN 791A, COEN 791B, etc.

ELEC 6041 Large-scale Control Systems (4 credits)
Prerequisite: ENGR 6131 or equivalent.
Introduction to large-scale systems and applications. Model-order reduction and minimal realization. Centralized and decentralized fixed modes (CDMs and DEMs). Characterization and computation of DEMs and approximate DEMs. Structured and unstructured DEMs. Quotient fixed modes and stabilizability of decentralized systems by means of linear time-varying control law. Effects of sampling on decentralized control systems. Centralized and decentralized robust servomechanism problem. Decentralized controller design using pole assignment technique and optimization method. A project.

ELEC 6051 Introduction to Analog VLSI (4 credits)
Challenges of IC techniques and of VLSI, BJT and MOS processes. Passive components; network models and simulations. Layout design rules and CAD packages. Switch, active resistor, current mirror and voltage references; differential amplifiers, comparators, operational amplifiers, transinductance amplifiers, voltage to current transducers. Noise considerations. Offset and precision techniques. Applications: RF amplifiers, filters, oscillators, current mode IC networks. A project.

ELEC 6061 Real-time Computer Control Systems (4 credits)
Introduction to real-time computer control systems; a review of discrete-time signals and systems, difference equations, z-transform; sampled data systems, sample and hold, discrete models; discrete equivalents of continuous-time systems; stability analysis; design specifications; design using root locus and frequency response methods; implementation issues including bumpless transfer, integral windup, sample rate selection, pre-filtering, quantization effects and computational delay; scheduling theory and priority assignment to control processes, timing of control loops, effects of missed deadlines; principles and characteristics of sensors and devices, embedded processors, processor/device interface. A project.

ELEC 6071 Analog VLSI Techniques for Signal Processing (4 credits)
Prerequisite: ELEC 6051.
Low noise amplifiers; LNA topologies, linearity and large-signal performance. RF mixers; nonlinear systems as linear mixers, multiplier based mixers. Oscillators; LC oscillators, negative resistance oscillators. Phase

locked loops; linear circuit models for PPL, noise properties, phase detectors, loop filters and charge pumps. High frequency Integrated Circuit Filters; OTA/gm-C architectures, filters using integrated inductors, Neural information processing. Statistical analysis techniques. A project.

ELEC 6081 Modern Analog Filter Design (4 credits)
Review of network analysis. Magnitude and frequency scaling. Magnitude and phase approximation in synthesis of filter functions. Second order active RC filters. Synthesis of all-pole LC ladder filters. Second order switched capacitor filters. Integrated circuit filters. A project.

ELEC 6091 Discrete Event Systems (4 credits)
Introduction to discrete-event systems (DES). Modeling (languages, automata and Petri nets). Supervisory control (controllability, modular control and control under partial observation). Architecture (decentralized and hierarchical schemes). Petri nets (modeling and analysis). Timed models. A project.

ELEC 6111 Detection and Estimation Theory (4 credits)
Prerequisite: ENCS 6161.
Basic hypothesis testing, cost functions, Bayes and Neyman Pearson tests, the power of a test, sequential tests; estimation, Bayes estimates, maximum a posteriori estimates; the Cramer-Rao inequality, maximum likelihood estimates; composite hypothesis testing, application of estimation theory to phase locked loops, vector representation of signals in noise, application of the Kharhunen-Loeve expansion, complex analytic representation of signals; detection and estimation of signals in white and non-white noise, the matched filter, composite hypothesis testing, random amplitude and phase, multi-path channels, waveform estimation, Wiener filters, Kalman filters. A project.

ELEC 6121 Spread Spectrum Communications (4 credits)
Prerequisite: ELEC 6831.
Direct sequence, frequency hopping, time hopping, chirp and hybrids, maximal Gold and nonlinear codes, probability or error analysis, under tone, partial band jamming for different systems, serial and parallel, initial acquisition, delay lock loops and tau dither loops, fading effects and potential coding techniques, new acquisition and tracking techniques, interception and repeated jammers. A project.
Note: Students who have received credit for ELEC 7131 may not take this course for credit.

ELEC 6131 Error Detecting and Correcting Codes (4 credits)
Prerequisite: ENCS 6161.
Communication channels and the coding problem; important linear block codes (cyclic, Hamming and BCH codes); encoding and decoding with shift registers; threshold decoding; introduction to convolutional codes; coding in system design considerations, bit error rates and coding gain, trade-offs in power, bandwidth, data rate and system reliability; codulation. A project.

ELEC 6141 Wireless Communications (4 credits)
Prerequisite: ELEC 6831.
Transmission media, analog transmission and multiplexing, digital transmission and multiplexing, link calculations, satellite transmission, microwave transmission, fading channels, nonlinear channels, intermodulation, multiple-access techniques: TDMA, FDMA, point-to-multipoint communications systems, performance objectives, measurement techniques, mobile communications systems. A project.

ELEC 6151 Information Theory and Source Coding (4 credits)
Prerequisite: ENCS 6161.
Entropy of a source, rate distortion functions, source coding, analog to digital conversion, effects of sampling and quantization, vector quantization, discrete memoryless channels and their capacity, cost functions, channel coding theorem, channel capacity, fundamental concepts of information theory with applications to digital communications, theory of data compression, broadcast channels, application to encryption, DES, public key encryption, computational complexity. A project.

ELEC 6171 Modeling and Analysis of Telecommunications Networks (4 credits)
Prerequisite: ENCS 6161.
Application of queuing theory to the analysis of the performance of telecommunication systems; Poisson arrival process and its properties; Birth-death processes applied to queuing, service distributions; performance measures of a queuing systems; examples of queuing systems in equilibrium; finite and infinite server and population models; Erlang blocking formulae; method of stages.; Networks of queues; product-form solution for open and closed queuing networks; computational algorithms for queuing networks; the imbedded Markov chain technique applied to queues with general service distribution, analysis of multiple access techniques, TDMA, FDMA, polling, CDMA, ALOHA and CSMA. A project.

ELEC 6181 Real-time and Multimedia Communication over Internet (4 credits)
Prerequisite: ELEC 6851.
Review of Internet architecture and protocols. Network impairments: jitter and delay. RTP: transport protocols for real-time data. Packet scheduling, QoS in the Internet: differentiated services, integrated services, Resource reservation protocol (RSVP), Multi protocol label switching (MPLS). Voice/Fax/Video over IP. Internet-to-PSTN. Protocols and standards - H.323, Session Initiation Protocol (SIP) and Media Gateway Control Protocol (MGCP). Internet telephony signaling. Interoperability issues. A project.

ELEC 6221 Solid State Devices (*) (4 credits)
Junction theory (PN junctions, Schottky and ohmic contacts, heterojunctions). Diodes and bipolar transistors. Light emitting diodes, photodetectors, solar cells and fibre optics. Lasers: operating principles and applications in optoelectronic devices. Planar silicon junctions and transistors will be designed, fabricated and evaluated in the laboratory, including resistivity measurements, semiconductor cleaning,

oxidation, diffusion, photolithography, etching, metallization, and the comparison of design with experimental results. A project.

ELEC 6231 Design of Integrated Circuit Components (*) (4 credits)
The structure, characteristics, and design of MOS capacitors and MOSFETsi Structures, characteristics and design of laser diodes. Optoelectronic devices and integrated circuits Planar MOS devices, including capacitors and MOSFETs will be designed, fabricated and evaluated in the laboratory. A project.

ELEC 6241 VLSI Process Technology (*) (4 credits)
Introduction to basic VLSI technologies; crystal growth, thermal oxidation, diffusion, ion implantation, chemical vapour deposition, wet and dry etching, and lithography. Layout, yield, and VLSI process integration. The lab demonstrates a semiconductor device fabrication process. A project.

ELEC 6251 Microtransducer Process Technology (4 credits)
Prerequisite: ELEC 6231 or ELEC 6241.
Overview of micromachining process. Bulk-micromachined structures and devices. Anisotropic etching of silicon; phenomena, processes, geometry, crystal physics. Surface-micromachined structures, devices, processes. CMOS-compatible micromachining. Case-study examples. A project.

ELEC 6261 Optical Devices for High-Speed Communications (4 credits)
Prerequisite: ELEC 6221 or equivalent.
Overview of optical properties of semiconductors. The fundamental principles for understanding and applying optical fiber technology, fundamental behaviour of the individual optical components and their interactions with other devices. Lasers, LED's, optical fibers, light detectors, optical switches. Concepts and components of WDM and DWDM. A comprehensive treatment of the underlying physics such as noise and distortion in optical communications, light polarization, modulation and attenuation. A project.

ELEC 6271 Nanoscience and Nanotechnology: Opto-Electronic Devices (4 credits)
This course covers the fundamental principles of nanoscience and nanotechnology which include principles of quantum mechanics and quantum properties of solid state materials. Properties of metal and semiconducting nanoparticles and their synthesis; Carbon nanostructures and nanotubes; bulk nanostructured materials; Solid disordered nanostructures and nanostructured crystals; quantum wells, quantum wires, and quantum dots and their physical properties; preparation of quantum nanostructures, Introduction to NanoElectroMechanical Systems (NEMS), nanomachining and fabrication of nanodevices. A project.

ELEC 6281 Principles of Solid State Nanodevices (4 credits)
Prerequisite: ELEC 6271 or equivalent.
Theoretical basis of nanodevices. Overview of fundamental quantum phenomena in semiconductors. Electronics in low-dimensional structures (two-dimensional electron gas, quantum wire and dots, electron

scattering, transport). High-speed electron devices based on quantum structures (nanoscale MOSFETs, high-electron-mobility transistors, resonant-tunneling diodes and transistors, superlattice-based transistors). Logic gates based on quantum devices. Quantum optoelectronics (optical transitions in quantum structures, quantum well, quantum dots photodetectors and lasers, quantum cascade lasers). Single electron devices. Carbon nanotube transistors, molecular electronics and spintronics. Nanodevice technology and characterization. A project.
Note: Students who have received credit for ELEC 691X (Principles of Solid State Nanodevices) may not take this course for credit.

ELEC 6301 Advanced Electromagnetics (4 credits)
Fundamental concepts. Conservation theorems, reciprocity, polarization and boundary conditions. Propagation in isotropic and anisotropic media. Plane waves in lossless and dissipative media. Reflection, transmission, guidance and resonance problems in rectangular coordinates. Solutions in cylindrical and spherical coordinate systems. Radiation. Scattering. Perturbational and variational techniques. A project.

ELEC 6311 Radiation and Scattering of Waves (4 credits)
Construction of Green's functions. Canonical problems – waveguide, cylinder, wedge, dielectric slab. Sommerfeld integrals. Impedance boundary conditions. Surface and leaky waves. Asymptotics, method of steepest descent, method of stationary phase. High-frequency uniform asymptotic methods. Geometrical theory of diffraction. Edge diffraction, creeping waves. Applications to problems in antennas, computational electromagnetics, electromagnetic compatibility, propagation, and scattering. A project.

ELEC 6341 Antennas (*) (4 credits)
Antenna fundamentals and definitions. Radiation integrals. Dipoles and loops. Arrays. Antenna self and mutual inductance. Matching techniques. Travelling wave antennas. Broadband antennas. Equivalence principle. Aperture antennas. Numerical techniques. Antenna measurement techniques. A project.

ELEC 6351 Modern Antenna Theory (4 credits)
Prerequisite: ELEC 6341.
Helmholtz equation, Green's function, current element, the ideal dipole, radiation impedance, gain directivity, reciprocity, polarization. Half-wave dipole, antennas above ground, small loop antenna, arrays of antenna, array factor, pattern multiplication array synthesis, mutual impedance, aperture antenna. Hallens integral equation, Pocklingons equation, numerical solution by the method of weighted residuals, and by the moment method, wire grids. Magnetic field integral equation and solid surfaces. Aperture antennas, aperture integration, geometrical optics, physical optics. Geometrical theory of diffraction, wedge diffraction coefficients, applications, multiple diffraction and diffraction by curved surfaces. A project.
Note: Students who have received credit for ELEC 7341 may not take this course for credit.

ELEC 6361 Acoustics (*) (4 credits)
Sound generation and propagation in elastic media; conversion between acoustical, electric and mechanical energy. Lumped-parameter approximations, sound in rooms, underwater acoustics, microphones; loudspeakers and audio communications problems; noise and vibration control problems. A project.

ELEC 6371 Design of Wireless RF Systems (4 credits)
Prerequisite: ELEC 6391.
Introduction to wireless systems. Noise and distortion in microwave systems. Antennas and propagation. Amplifiers. Mixers. Transistor oscillators and frequency synthesizers. Modulation techniques. Receiver design. Use of RF CAD tools. A project.

ELEC 6381 Techniques in Electromagnetic Compatibility (4 credits)
Introduction to EMC procedures, control plans and specifications. Radiated and conducted susceptibility and emission testing. Introduction EMC antennas, antenna concepts, electric and magnetic dipoles, biconical dipoles, conical log spiral antennas, setting up fields for susceptibility testing, measuring radiation from equipment. Coupled transmission lines, pulse propagation, closely spaced parallel transmission lines, capacitive coupling, inductive coupling, shielding against magnetic fields. Shielding and enclosures, electric and magnetic field screening mechanisms, shielding effectiveness, grounding considerations. EMC test facilities, screened rooms, TEM cells. Signals and spectra, intermodulation, cross-modulation, the spectrum analyzer. Noise and pseudo-random noise, noise performance of measurement/receiving systems, noise equivalent bandwidth, noise figure, antenna noise temperature and S/N ratio. A project.

ELEC 6391 Microwave Engineering (*) (4 credits)
Properties of waveguides, striplines and microstrips. Scattering parameters. Butterworth and Chebyshev impedance transformers. Microwave couplers, cavities, and Fabry-Perot resonators. Periodic structures. Microwave filter design. Faraday rotation and non-reciprocal devices. A project.

ELEC 6411 Power Electronics I (*) (4 credits)
Introduction to power electronic systems. Semiconductor switches. Basic power converter configurations. Line commutated controlled and uncontrolled ac-dc rectifiers. Basic dc-dc converters. Pulse width modulation techniques. Basic dc-ac converters. Switching power supplies. Applications to industrial power supplies and motor drives. A project.

ELEC 6461 Power Electronics II (4 credits)
Prerequisite: ELEC 6411.
Circuits and operating principles of self commutated dc-dc and dc-ac converters. One and four quadrant dc-dc converters. Single-phase and three-phase voltage source and current source inverters. Pulse width modulation strategies. Resonant converters. Soft switching techniques. Isolated dc-dc converters. Application to switch-mode power supplies, uninterruptible power supplies and ac motor drives. A project.

ELEC 6471 Hybrid Electric Vehicle Power System Design and Control (*) (4 credits)
Prerequisite: ELEC 6411.
Introduction to Electric Vehicles (EV), Hybrid Electric Vehicles (HEV). Vehicle design fundamentals. Traction motors for EV/HEV propulsion. On-board energy sources and storage devices: high-voltage traction batteries, fuel cells, ultra-capacitors, flywheels. Power electronic converters and control. Various EV/HEV/Fuel Cell Vehicle topologies and modeling. Energy management strategies. Practical design considerations. Engineering impact of electric, hybrid electric, and fuel cell vehicles. A project.

ELEC 6481 Computer-aided Analysis of Power Electronic Systems (4 credits)
Prerequisite: ELEC 6411.
Algorithms for the systematic formulation of equations for power electronic converters containing passive and active elements, and semiconductor switches. Modeling of semiconductor switching devices. Description of general-purpose simulation packages. Modeling of static power converters; average modeling. Simulation of power and control circuits. Design of controllers. Case studies of common converters. A project..

ELEC 6491 Controlled Electric Drives (4 credits)
Prerequisite: ELEC 6411.
Elements of a drive system; characteristics of common mechanical systems; drive characteristics; operation in one, two or four quadrants. Fully controlled rectifier drives; braking of DC motors; control of DC motors using DC/DC converters. Control of polyphase induction motors; voltage-source and current source inverter drives; frequency-controlled induction motor drives; introduction to vector control of induction motor drives; field oriented control (FOC); sensor-less operation. Control of synchronous motors; permanent magnet motors. Switched reluctance motor (SRM) drives; stepper motors. Brush-less DC (BLDC) motor drives; low-power electronic motor drives. A project.

ELEC 6601 Digital Signal Processing (4 credits)
Discrete-time signals and systems, difference equation; the discrete Fourier series and transform; the Z-transform and LTI systems; sampling of continuous-time signals. Reconstruction of signals using interpolation, sampling of discrete-time signals, discrete-time decimation and interpolation, changing the sampling rate by integer and non-integer factor; multirate signal processing, polyphase decomposition, multirate filter banks; digital processing of analog signals, A/D and D/A converters; linear phase and non-linear phase systems, all-pass and minimum phase systems; recursive and non-recursive digital filters, common digital filter structures, common design approaches for digital filters; random signals; linear adaptive filters, Weiner and Least-Mean-Square filters. A project.

ELEC 6611 Digital Filters (4 credits)
Prerequisite: ELEC 6601.
Approximation and design of recursive and non-recursive digital filters. Transformations. Stability. Digital

filter structures including wave and lattice structures. Effect of quantization, noise and limit cycles. Hardware implementation. Digital filter applications. A project.

ELEC 6621 Digital Waveform Compression (4 credits)
Prerequisites: ELEC 6601; ENCS 6161.
Numerical representation of waveform information; common waveform communication systems; statistical models used for waveforms; visual psychophysics. Differential PCM, motion estimation/compensation for video compressions. Transform coding: run length coding, Huffman and arithmetic coding, control of Q factor and Q table, segmentation/contour/edge based coding; pre-processing and post-processing strategies. Vector quantization. Sub-band coding and Wavelet Transform. Zero trees. Channel concerns: robustness, error recovery, masking video/image bit rate source models. Coding of two-level graphics. Review of standards: JPEG, MPEG, H.261. A project.

ELEC 6631 Digital Video Processing (4 credits)
Prerequisites: ELEC 6601; ENCS 6161.
Video processing fundamentals; video signals and systems. Fourier analysis of video signals, video scanning and transmission, spatio-temporal sampling, selected material on the Human Visual System, modelling of video components, motion estimation and representation. Video filtering and enhancement: noise reduction, noise estimation, de-interlacing, frame-rate conversion, signal processing for improved TV-systems. An introduction to video compression, Low-level video analysis: local operators, linear and non-linear operators, rank-order filters, morphological filters, edge detection, segmentation. A project.

ELEC 6641 Two-dimensional Signal and Image Processing (4 credits)
Prerequisite: ELEC 6601.
Two-dimensional signals and systems: linear system fundamentals, Fourier analysis of two-dimensional signals, discrete Fourier transform, two-dimensional FIR and IIR filter design and implementations. Image enhancement and restoration: smoothing and sharpening, noise reduction, order statistics filtering, inverse filtering, Wiener filtering, constrained least-square filtering. Wavelets and filter banks: multiresolution concept, perfect reconstruction, one- and two-dimensional wavelet transforms. Introduction to image compression: lossy and lossless compression, image compression standards. Introduction to image segmentation and edge detection. Color image processing: color image representation, color space conversion, pseudo and full color image processing. A project.
Note: Students who have taken ELEC 7631 may not take this course for credit.

ELEC 6651 Adaptive Signal Processing (4 credits)
Prerequisites: ELEC 6601; ENCS 6161.
Optimal filtering; adaptive filter structures; linear prediction; lattice structures; Levinson recursion. The LMS-based algorithms; basic LMS and properties; mean-square error surface; stability and convergence behavior; normalized LMS; affine projection. Recursive least-square methods; method of least-squares; block

least-squares methods. Frequency-domain and sub-band adaptive filters. Kalman filtering. Applications of adaptive filters. A project.
Note: Students who have taken ELEC 7601 may not take this course for credit.

ELEC 6831 Digital Communications I (4 credits)
Random processes and linear systems; baseband modulation/demodulation, optimal receivers in AWGN, correlation and matched-filter receivers, pulse shaping for band-limited channels; bandpass modulation techniques such as PAM, PSK, DPSK, FSK, QAM; Introduction to error control coding, Linear block codes, Cyclic codes, Convolutional codes. A project.

ELEC 6841 Digital Communications II (4 credits)
Prerequisites: ELEC 6831; ENCS 6161.
Digital signaling over band-limited channels: signal design for band-limited channels, maximum likelihood sequence detection, equalization techniques, e.g., zero-forcing, minimum mean squared error, adaptive equalization. Advanced coding and modulation: concatenated coding with iterative decoding, coded modulation techniques. Diversity techniques for fading channels. Synchronization techniques: carrier and timing recovery, frequency estimation techniques, frame and network synchronization, maximum-likelihood estimation and Cramer-Rao bounds. A project.

ELEC 6851 Telecommunications Networks (4 credits)
Communication Networks and Services; Introduction to Layered Network Architectures; Transmission systems and the Telephone Network: multiplexing circuit switching, routing and signaling; Peer-to-Peer Protocols: ARQ protocols, data link controls, packet multiplexing, Multiple Access Communications: Aloha, CSMA, reservation schemes, polling, token-passing ring, LAN standards, LAN Bridges; Packet-switching Networks: Datagrams and virtual circuits; TCP/IP Architecture: Internet protocol, transmission control protocol. A project.

ELEC 6861 Higher Layer Telecommunications Protocols (4 credits)
Prerequisite: ELEC 6851.
Broadband communications: concept, issues, signaling techniques, examples. Multimedia communications: traffic characteristics, classes, issues (e.g. QOS) and architectures. Internetworking: issues, architectures (e.g. router, bridge, gateway), protocols and standards: ISO, IP and IPv6. Network Management: issues, architecture, management information base (MIBs), SNMP, TMN and CMIP. Advanced topics, such as policy approach for network management. A project.

ELEC 6871 Fiber-Optic Communication Systems and Networks (4 credits)
Overview of the basics of optical transmitters, optical receivers, optical fibers, optical amplifiers, and SDH/SONET. Design of optical fiber amplifiers: fiber Raman amplifiers and Erbium-doped fiber amplifiers (EDFA), theories, configurations, simulation, designs, applications, requirements for optical networks.

Optical transmitters: characteristics and requirements for optical networks. Optical receivers: characteristics, requirements, noise analysis. Optical systems and performance: system architectures, design guidelines, long-haul systems, dispersion management. Coherent optical systems: ASK, FSK, DPSK, system performance. DWDM systems and networks: WAN and MAN system performance, TDM, subcarrier multiplexing, CDMA, WDM network design, network survivability. Optical solition systems: fiber solitions, loss-managed solitions, dispersion-managed solitions, impact of amplifier noise, high-speed solition system. Photonic packet switching: OTDM synchronization, header processing, burst switching. Access optical networks: architectures, PON. A project.

ELEC 6881 Fundamentals and Applications of MIMO Communications (4 credits)
Prerequisite: ELEC 6141 or ELEC 6841.
Multiple Input Multiple Output (MIMO) communication systems and wireless channel models; Diversity techniques and array processing; MIMO channel capacity; Space-time black and trellis codes; Spatial multiplexing and layered space-time architectures, diversity-versus-multiplexing tradeoff; Differential and unitary space-time coding; MIMO OFDM and space-frequency coding; Concatenated coding and iterative decoding for MIMO systems; Applications of MIMO in wireless systems. A project.

ELEC 691 Topics in Electrical Engineering I (4 credits)
See Note in Topic Area E02

ELEC 6961 Graduate Seminar in Electrical and Computer Engineering (1 credit)
Students must attend a set of seminars identified by the Department and submit a comprehensive report on topics presented in one of these seminars. The report, including an abstract, must be suitably documented and illustrated, should be at least 1000 words in length, must be typewritten on one side of 21.5 cm by 28 cm white paper of quality, and must be enclosed in binding. Students are referred to *Form and Style: Thesis, Reports, Term Papers, fourth edition by Campbell and Ballou*, published by Houghton Mifflin. Seminar: two hours per week.

ELEC 7151 Broadband Communications Networks (4 credits)
Prerequisite: ELEC 6171.
Characterization of traffic sources, data, voice and video; ATM protocol architecture, ATM switching architectures, performance evaluation of the ATM multiplexer; Call admission control in ATM networks; Traffic management in ATM, TCP/IP over ATM and wireless ATM Fluid flow approximation, z-transform techniques, and blocking for multiclass flows. A project.

ELEC 7441 Design of Power Electronic Circuits (4 credits)
Prerequisite: ELEC 6461.
Design driving factors. Characteristics of basic converter topologies, including resonant and soft switching circuits. Characteristics and limitations of power semiconductors as switching devices. Design considerations

for gate drives, snubbers, power filters and protection circuits. Printed circuit board and thermal design. Application to the practical design of typical power converter systems. A project.

ELEC 7451 Power System Compensation (4 credits)
Prerequisite: ELEC 6411.
Steady state and dynamic characteristics of transmission systems. Theory of line compensation and reactive power control; series and shunt passive compensation. Principles of operation of static compensators and basic configurations; series, shunt and shunt-series. Flexible ac transmission systems (FACTS). Line and self commutated controllers; configurations and control aspects. Applications to distribution systems. Performance evaluation and practical applications of static compensators. A project.

ELEC 791 Topics in Electrical Engineering II (4 credits)
See Note in Topic Area E02

ELEC 8011 Doctoral Seminar in Electrical Engineering
Grading on a Pass/Fail basis only. No credit value.

Engineering & Computer Science

ENCS 5721 Composition and Argumentation for Engineers (3 credits)
Fundamentals of English composition and argumentation: grammar, reasoning and persuasion; persuasive proofs; argumentation; structuring and outlining: the problem statement; the body; and the conclusions. Language and persuasion for effective communication in professional engineering. Cultivation of a writing style firmly based on clear and critical thinking skills. Lectures: three hours per week.
Note: This course cannot be taken within the credit requirements of the program.Students who have taken ENCS 591A (Composition and Argumentation for Engineers) may not take this course for credit.

ENCS 6001 Elements of Engineering Mathematics (3 credits)
Functions of one variable, Taylor's series expansion, review of differentiation, integration and solution of ordinary differential equations. Functions of several variables, partial derivatives, multiple integrals, introduction to partial differential equations, wave equation and diffusion equation. Matrix and vector analysis, characteristic value problems, orthogonal functions; introduction to statistics and numerical methods. Lectures: three hours per week.

ENCS 6021 Engineering Analysis (4 credits)
Sturm-Liouville problem; orthogonal functions; ordinary differential equations with variable coefficients and power series solutions; integral transforms; partial differential equations; boundary value problems; applications to engineering problems. A project.

ENCS 6041 Creativity, Innovation, and Critical Thinking (3 credits)
Explanations of innovative and creativity thinking; approaches to problem solving, psychology of invention; diffusion of innovation; leadership through critical thinking; design creativity; modern and historical examples of innovation; and cognitive approaches to scientific and technological thinking.

ENCS 6111 Numerical Methods (4 credits)
Numerical solution of partial differential equations; weighted residuals techniques with emphasis on finite differences and finite elements; convergence, stability and consistency analysis; solution of integral equations; boundary value problems; discrete Fourier series and fast Fourier transform. A project.

ENCS 6141 Probabilistic Methods in Design (4 credits)
Prerequisite: ENCS 6011 or equivalent.
Elements of probability theory, decision models, expected costs and benefits, models from random occurrences, extreme value statistics, Monte Carlo simulation, reliability analysis, general applications to engineering design problems. A project.

ENCS 6161 Probability and Stochastic Processes (4 credits)
Axioms and rules of probabilities, Bayes' Theorem, binary communication systems, Bernoulli trials and Poisson Theorem, random variables, distributions and density functions, moments, correlation, Chebyshev and Markov's inequalities, characteristic functions, Chernoff inequality, transformation of random variable, random processes, stationarity, Bernoulli, Random Walk, Poisson, shot noise, random telegraph, and Wiener processes, stopping time; Wald's equation, elements of Renewal Theory, Mean-Ergodic Theorem, auto and cross-correlation functions, correlation time, auto-correlation receiver, Wiener-Khinchin Theorem, power spectral density, linear system with stochastic inputs, matched filtering. Project: two hours per week.
Note: Students who have received credit for ELEC 6161 may not take this course for credit.

ENCS 6181 Optimization Techniques I (*) (4 credits)
The optimization problem; classical optimization; one dimensional search techniques; unconstrained gradient techniques; quadratically convergent minimization algorithms; constrained optimization; constrained gradient techniques; penalty-function methods; applications. Project: two hours per week.

ENCS 6191 Fuzzy Sets and Fuzzy Logic (4 credits)
Fuzzy sets, operations on fuzzy sets, fuzzy relations; fuzzy logic: connectives, implication functions, representation of fuzzy rules and fuzzy logic based reasoning; fuzzy logic in planning and control: Zadeh's Generalized Modus Ponens type reasoning, Mamdani type reasoning, fuzzy clustering based system identification and Sugeno type reasoning; case studies. Projects on selected applications.

ENCS 6721 Technical Writing and Research Methods for Scientists and Engineers (3 credits)
This course provides graduate students with the research writing and presentation skills that are essential in

academic and professional contexts. Students develop expertise and confidence in research methods, critical reading, crafting thesis statements, leading and participating in discussions, revision/editing and peer review, maintaining research dossiers and report writing.
Note: This course cannot be taken within the credit requirements of any graduate Engineering and Computer Science program, with the exception of the Diploma in Computer Science, the Master of Engineering and the Master of Applied Computer Science. Students who have taken ENCS 591B (Technical Writing and Research Methods) may not take this course for credit.

ENCS 6811 Optical Networking: Architectures and Protocols (4 credits)
This course introduces advanced concepts and protocols of modern telecommunication networks based on Photonic technology. The basics of optical communications networks will be introduced, including the enabling technology, and the main emphasis will be on network architectures and associated protocols. This includes: orientation of transport networks and their evolution (Ring and Mesh topologies); Wavelength Division Multiplexing (WDM); wavelength-routed networks; wavelength conversion; lightpath routing protocols (static, dynamic, adaptive routing and traffic grooming) and optimization problems; control and management protocols and distributed provisioning; survivable network design (proactive and reactive); fault-management and various network restoration protocols; convergence of optical networks and the Internet (IP/WDM) and Generalized Multi Protocol Label Switching (G-MPLS). There will be various assignments in which students will be involved in research projects. Knowledge of telecommunication systems and a background in network simulation is needed. Project.

ENCS 691 Topics in Engineering and Computer Science (4 credits)
Subject matter will vary from term to term and from year to year. Students may re-register for this course providing that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g. ENCS 691A, ENCS 691B, etc.

ENCS 6931 Industrial Stage and Training (9 credits)
Prerequisite: Completion of at least twenty credits in the program and permission of the Departmental Co-op Program Director.
This is an integral component of the Industrial Experience option that is to be completed under the supervision of an experienced engineer/computer scientist in the facilities of a participating company (a Canadian work permit is required).
Each student receives an assessment from the Departmental Co-op Program Director in consultation with the industry supervisor and the faculty advisor. Grading is on a pass/fail basis based on a proposal, monthly progress reports, a final report and a presentation.

ENCS 8011 PhD Seminar (2 credits)
Prerequisite: ENCS 8511 Doctoral Research Proposal.
The PhD Seminar is designed to train students to communicate the results of their research projects to the

community and participate in research discussions. This is done when the students have sufficiently progressed into their research, normally after 6 (12 for part-time students) months of being admitted to candidacy, which is normally after 24 (48 for part-time students) months of residency, and must be completed before the submission of the thesis. The student's evaluation, reflected by either a pass or fail grade, is based upon attendance in all seminars, a report on the student's thesis research under the direction of the thesis supervisor(s), and a presentation.
Note: Students who have completed ENCS 8011 prior to September 2005 may not take this Seminar for credit.

ENCS 8501 Comprehensive Examination (No credit value)
See Requirements for the Degree in Engineering Programs section.

ENCS 8511 Doctoral Research Proposal (6 credits)
The goal of the doctoral research proposal is to focus the student's PhD research. The proposal must include an extensive critical review of previous work on the subject of the thesis, and a detailed research plan of action and expected milestones. Students are required to defend their doctoral research proposal before a committee that will normally be comprised of the same members as the comprehensive examination committee.
Note: Students admitted prior to September 1997 are not allowed to substitute ENCS 8511 for an equivalent course work.

ENGR 6071 Switched and Hybrid Control System (4 credits)
Prerequisite: ENGR 6131 or equivalent.
Review of linear control design techniques for nonlinear systems and their limitations; introduction to Lyapunov stability, Lyapunov functions and LaSalle's invariance principle; introduction to switched and hybrid systems using piecewise-affine systems as a motivating example; modeling and simulation of switched and hybrid systems; switching policies, hybrid automata and executions; Lyapunov stability analysis of switched and hybrid systems; stability as a convex optimization problem; Lyapunov-based control of switched and hybrid systems; controller design as a non-convex problem; stability analyses and the controller design problems; dynamic programming and optimal control techniques; extensive examples from simplified models of industrial problems in the aeronautical, automotive and process industries. The course includes a computer aided controller design project.

ENGR 6131 Linear Systems (*) (4 credits)
State-space representation of dynamic systems, canonical realizations, solutions, modal decomposition, stability. Controllability and observability, minimal realizations, state feedback, pole placement, observers, observer-based controllers. Introduction to optimal control, linear quadratic regulator, the Kalman filter. Limitation on performance of control systems, introduction to robustness. A project.

ENGR 6141 Nonlinear Systems (4 credits)
Prerequisite: ENGR 6131.
Dynamic systems: definitions and notations; nonlinear differential equations; Lipschitz continuity; linearization; describing functions; phase plane analysis; Lyapunov stability; Popov and circle criteria; limit cycles. A project.

ENGR 6161 Sensors and Actuators (4 credits)
Elements of smart sensors and systems and their structures; properties of various smart materials including piezoelectric, pyroelectric, shape memory alloys, Rheological fluids, piezoresistive and magnetostrictive; physical and mathematical basis of smart materials; characterization of smart multi-functional materials; sensors and actuators in mechatronics; design and fabrication of sensors and actuators by micromachining; survey of classical system theory; design of sensors and actuators for applications in industrial and medical robotics, haptics, and other systems such as aerospace and smart structures. The students are required to undertake a project work involving design of smart sensors/actuators for specific applications.

ENGR 6191 Introduction to Biomedical Engineering (4 credits)
The origin and characteristics of biological potentials: nerve, muscle, heart, brain; the measurement of biological events; instrumentation systems: electrical safety, biomechanics, biomaterials, orthopaedic engineering; biomedical engineering applications/implications in industry. Project on a current topic.

ENGR 6201 Fluid Mechanics (4 credits)
Fundamental concepts of fluid mechanics; transport phenomena; stress-strain relation; equations of motion; exact solutions; dynamic similarity; specialized equations; laminar boundary layers; flow over immersed bodies; introduction to turbulent flow. Projects on selected topics.

ENGR 6221 Microfluidic Systems (4 credits)
Prerequisite: ENGR 6201 or equivalent.
Introduction to microfluidics: continuum fluid mechanics, non-continuum regimes, molecular approach. Review of classical fluid mechanics: gas flows, liquid flows, two-phase flows. Microfluidic effects: low Reynolds number flows and chaotic mixing, electrokinetics, surface tension effects and electrowetting. Electrostatic/electromagnetic/piezoelectric actuation of microfluidic systems. Methods in microfluidics: computation, experimentation. Microfluidic components: microchannels, micromixers, micropumps, microvalves, microsesors. Overview of microfluidic applications: lab-on-chip devices, microstructured fuel cells. A project.

ENGR 6241 Hydrodynamics (4 credits)
Prerequisite: ENGR 6201.
Fundamental concepts of ideal flow; irrotational flow patterns; kinematics of flow; potential theory;

standard flow patterns; conformal transformation; Cauchy-Riemann condition; complex operator; simple engineering applications. A project.

ENGR 6251 The Finite Difference Method in Computational Fluid Dynamics (4 credits)
Prerequisite: ENGR 6201.
Classification of second order partial differential equations, boundary conditions. Finite difference discretization of equations, truncation error, explicit and implicit formulations. Numerical stability, consistency and convergence. Time dependent (parabolic) equations, explicit and implicit discretization, stability, convergence. Steady state (elliptic) equations, explicit and implicit discretization, iterative and direct solution methods. Hyperbolic equations. Formulation of flow problems and applications to incompressible, compressible and transonic inviscid and viscous flows are interspersed throughout the course. Project on specific topic or applications.

ENGR 6261 The Finite Element Method in Computational Fluid Dynamics (4 credits)
Prerequisite: ENGR 6201.
Classification of second order partial differential equations, boundary conditions. The finite element method, simple examples, assembly rules, solution of linear systems of equations. Forming the modules of a general FEM computer code. The variational approach, variational principles and stationary functions. Elements and interpolation functions. The weighted residual approach Rayleigh-Ritz, least squares, subdomain and collocation, weak Galerkin formulation. Formulation of flow problems and applications to incompressible, compressible and transonic inviscid and viscous flows are interspersed throughout the course. Project on specific topic or applications.

ENGR 6281 Modeling Turbulent Flows (4 credits)
Computational methods in fluid mechanics, the Reynolds-averaged equations, scales of turbulence, two-point correlation tensors, algebraic models, one equation and two equation models, Boussinesq approximation, nonlinear constitutive relations, types of turbulent flows, multiple time scales and stiff differential equations, solution convergence and grid sensitivity, brief introduction to advanced models. A project.
Note: Students who have received credit for ENGR 691C (Modeling Turbulent Flows) may not take this course for credit.

ENGR 6291 Rheology (4 credits)
Viscoelasticity, standard flows and material functions, relationships between material functions, generalized Newtonian fluid, the Maxwell model, finite linear viscoelasticity, continuum constitutive equations, effects of material, temperature and pressure on viscoelasticity behaviour, rheometry issues in viscoelastic flow simulations, industrial applications of rheology. A project.
Note: Basic understanding of fluid mechanics is required.

ENGR 6301 Advanced Dynamics (4 credits)
Dynamics of rigid bodies; generalized coordinates; D'Alembert's principle; Lagrange's equations; energy methods, Hamilton's theory; Euler-Lagrange equations; variational principle of mechanics. Phase space canonical transformation. Language multipliers methods. Hamilton-Jacobe equation. Project on specific topic or applications.

ENGR 6311 Vibrations in Machines and Structures (*) (4 credits)
Vibrations of discrete systems: Single-Degree of Freedom (SDOF) and Multi-Degree of Freedom (MDOF) systems; continuous systems: bars, beams, membranes and plates with various boundary conditions; mode superposition; energy methods; Rayleigh-Ritz Method; condensation techniques; applications to machine components, rotor bearing systems, vehicle and aerospace structures. Project on selected topics is an integral part of the course.

ENGR 6411 Robotic Manipulators I: Mechanics (*) (4 credits)
Types of industrial robots and their applications. Mathematical analysis for robot manipulation: homogeneous transformations; definition and solution of kinematic equations governing the position and orientation of the hand. Force analysis and static accuracy; forces and moments of inertia, dynamic equation of equilibrium, differential equations of motion of robotic arms. Robotic actuators. Project on specific topic or applications.

ENGR 6421 Standards, Regulations and Certification (4 credits)
Overview of DoT and other international (FAA, etc.) aviation standards, regulations and certification procedures; regulatory areas, namely, pilot training/testing, air traffic procedures, aircraft systems design and airworthiness; development process for new regulations and criteria for certification. Projects on selected topics.

ENGR 6441 Materials Engineering for Aerospace (4 credits)
Fundamentals of materials engineering and processing with special emphasis on aerospace engineering materials and protection against failure; microstructures, phase equilibria for aerospace materials, dislocations, deformation, strain hardening and annealing, recovery, recrystallization; hot and cold metal forming (aircraft fabrication), solidification, castings (process and defects); welding and non-destructive testing, solid solution and dispersion strengthening; ferrous alloys and super alloys, light alloys (AL, MG, TI), ceramic materials, polymers, composite materials (polymer matrix/metal matrix); corrosion, fatigue and creep failure; fracture and wear. Projects on selected topics.

ENGR 6461 Avionic Navigation Systems (4 credits)
Introduction: history of air navigation; earth coordinate and mapping systems; international navigation standards; airspace and air traffic control structure; basics of flight instruments and flight controls; fundamental concepts of navigation. Classification of modern avionic navigation systems. Basics of air traffic

communication: radio wave propagation; VHF and HF systems. Short range, long range, approach/terminal area avionic navigation systems and radar systems: principles; design; advantages/disadvantages; errors; impact of global positioning system and future trends. Introduction to advanced integrated avionic systems. Projects on selected topics.

ENGR 6471 Integration of Avionics Systems (*) (4 credits)
Prerequisite: ENGR 6461.
Introduction to the basic principles of integration of avionics systems; review of Earth's geometry and Newton's laws; inertial navigation sensors and systems (INS); errors and uncertainty in navigation; global positioning system (GPS); differential and carrier tracking GPS applications; terrestrial radio navigation systems; Kalman filtering; integration of navigation systems using Kalman filtering; emphasis on integration of GPS and INS using Kalman filtering. A project.

ENGR 6501 Applied Elasticity (4 credits)
Plane stress and strain; analysis of stress and strain in three dimensions; Airy's stress function; solution of two-dimensional problems by polynomials and Fourier series; effect of small holes in bars and plates; torsion and bending of prismatic bars; Membrane analogy; thermoelasticity; rectangular, circular, ring-shaped flat plates; applications in civil and mechanical engineering. A case study or a project.

ENGR 6511 Matrix Analysis of Structures (*) (4 credits)
Analysis of statically loaded framed structures by matrix methods; energy concepts in matrix form; transformation of information in structures; flexibility and stiffness methods; computer applications. A project.

ENGR 6531 The Finite Element Method in Structural Mechanics (4 credits)
Prerequisite: ENGR 6511.
Displacement analysis of structures; finite elements of a continuum; applications of the method to stress analysis of two- and three-dimensional structures; stability problems; vibrations and heat transfer; digital computer applications. A project.

ENGR 6541 Structural Dynamics (4 credits)
Prerequisite: ENGR 6511.
Dynamic behaviour of structures; lumping of masses; motion of elastic framed structures caused by arbitrary disturbances; analytical and numerical methods of solution; approximate determinations of natural frequencies in elastic systems; dynamic response of framed structures in the inelastic range; continuous systems, introduction to approximate design methods. A case study or a project.

ENGR 6551 Theory of Elastic and Inelastic Stability (4 credits)
Analysis of elastic and inelastic stability of columns; frame buckling; beam-columns, strength of plates,

shear webs and shells; torsiona; flexural buckling of thin-walled, open sections; snap-through; critical discussion of current design specifications; applications to structures. A case study or a project.

ENGR 6561 Theory of Plates and Shells (4 credits)
Analysis of deformation and stress in plates and flat slabs under transverse loads; various boundary conditions; numerical methods; membrane stresses and displacements in shells under various loading; bending theory of shells; limit analysis of rotationally symmetric plates and shells; applications to shell type structures such as folded plate structures; sandwich plates; shell roofs and pressure vessels. A case study or a project.

ENGR 6571 Energy Methods in Structural Mechanics (4 credits)
Prerequisite: ENGR 6511.
Principles of virtual work, total potential and complementary energy. Reisner's Principle. Introduction to calculus of variations. Ritz and Galerkin's methods. Applications to frame, plate and shell structures. A project.

ENGR 6581 Introduction to Structural Dynamics (*) (4 credits)
Theory of vibrations. Dynamic response of simple structural systems. Effects of blast, wind, traffic and machinery vibrations. Basic concepts in earthquake resistant design. Computer applications. A case study or a project.

ENGR 6601 Principles of Solar Engineering (4 credits)
Prerequisite: BLDG 6541.
Magnitude and availability of the solar energy input, including seasonal and diurnal variations of direct beam radiation; spectral distribution of sunlight; scattering and absorption processes; diffuse radiation; influence of cloud cover. Magnitude and time variation of typical loads, including space heating and cooling water heating; dehumidification. Principles of passive and active methods of solar collection, thermal conversion, and energy storage. Analysis of systems and components, including treatment of thermal and turbulent losses; efficiency calculations; electrical analogies; impedance matching and system optimization. Economics of systems. A case study or a project.

ENGR 6611 Equipment Design for Solar Energy Conversion (4 credits)
Prerequisite: ENGR 6201.
This course emphasizes the mechanical design of solar heating and cooling systems and consists of the following topics: thermodynamic analysis of radiation, collection and conversion of solar energy, selection and manufacturing of components such as collectors, piping, line insulation, heat exchangers, etc., solar cooling and dehumidification, control of solar energy systems, case studies and project experiences. A case study or a project.

ENGR 6661 Solar Energy Materials Science (4 credits)
The place of organisms and materials in the solar energy cycle; physical, chemical and optical phenomena. Selective absorbers: surfaces and films, emissivity, thermal conversion, role of crystal defects and phase interfaces in metals and semiconductors. Reflector characteristics and damage modes. Optical and mechanical properties of glass, polymer and composite windows. Photovoltaic: physics and materials. Chemical, thermal and photo stability. Thermal transfer and storage media: gaseous, aqueous, organic; phase change and particulate systems; stability and corrosive effects. A case study or a project.

ENGR 6811 Energy Resources: Conventional and Renewable (4 credits) Depletion of conventional energy sources. Emission of greenhouse gases from conventional power production systems. Principles of renewable energy systems; cogeneration of electrical and thermal energy, photovoltaic systems, wind power, fuel cells, hybrid systems. Hydrogen and other forms of energy storage for renewable power production. Integrated and small-scale renewable energy systems; independent versus grid-connected systems. A case study or a project.

ENGR 691 Topics in Engineering I (4 credits)
See Note in Topic Area E02

ENGR 6951 Seminar on Space Studies (4 credits)
Prerequisite: Permission of Instructor.
Introduction to the science and technology of spaceflight; remote sensing; human factors in space; automation and robotics; space law; space transportation systems; the space station; the Moon-Mars initiative; space utilization; interplanetary travel. Project on selected topic.

ENGR 6971 Project and Report I (4 credits)
See Requirements for the Degree in Engineering Programs section. Project: 8 hours per week.

ENGR 6981 Project and Report II (4 credits)
See Requirements for the Degree in Engineering Programs section. Project: 8 hours per week.

ENGR 6991 Project and Report III (5 credits)
See Requirements for the Degree in Engineering Programs section. Project: 10 hours per week.

ENGR 7011 Graduate Seminar in Mechanical and Industrial Engineering (1 credit)
Seminar: 2 hours per week.

ENGR 7121 Analysis and Design of Linear Multivariable Systems (4 credits)
Prerequisite: ENGR 6131.
Representation of linear multivariable systems. Controllability, observability and canonical forms; poles and

zeroes; multivariable system inverses; the linear quadratic regulator problem; the robust servomechanism problem; the minimal design problem; frequency-domain design techniques. Project: 2 hours per week.

ENGR 7131 Adaptive Control (4 credits)
Prerequisite: ELEC, 6061, ENGR 6131.
Real-time parameter estimation; least-squares and regression models; recursive estimators; model reference adaptive systems (MRAS); MRAS based on gradient approach and stability theory; self-tuning regulators (STR); adaptive prediction and control; stability and convergence results, robustness issues; auto-tuning and gain scheduling; alternatives to adaptive control; practical aspects; implementation and applications. Project: 2 hours per week.

ENGR 7181 Digital Control of Dynamics Systems (4 credits)
Prerequisites: ELEC 6061, ENGR 6131.
Review of discrete-time and sampled-data systems; discrete input-output and state-space equivalents; controllability and observability of sampled-data systems; controller design using transform techniques, design using state-space methods; generalized sample-data hold functions; optimal control; quantization effects; multirate sampling; robust control; discrete-time non-linear systems; discrete-time multivariable systems. A project.
Note: Students who have received credit for ENGR 6181 may not take this course for credit.

ENGR 7201 Microgravity Fluid Dynamics (4 credits)
Prerequisite: ENGR 6201.
Forces and accelerations in space environment; zero-gravity simulation, free falling capsules, flights in Keplerian trajectories, sounding rockets, and the space station; surface tension; main non-dimensional parameters; Laplace-Young equation; contact angle; Dupre's equation; Neumann's triangle; minimization principle associated with Laplace's equation; equilibrium shapes of a liquid, small oscillations of ideal and viscous fluids, liquid handling problems at low gravity, liquid positioning and control, vortexing capillary; numerical simulations of liquid dynamics in microgravity environment. Projects on selected topics.

ENGR 7331 Random Vibrations (4 credits)
Prerequisite: ENGR 6311.
Mathematical descriptions of stochastic processes; spectral density and correlation functions; Gaussian and non-Gaussian random processes; Markov processes and Fokker/Planck equation; response of linear and nonlinear oscillatory systems to random excitation; non-stationary and narrow-band random processes. Project on selected research topic or applications.

ENGR 7401 Robotic Manipulators II: Control (4 credits)
Prerequisite: ENGR 6411.
Control of a single link manipulator; position, velocity and acceleration errors; control of a multiple link

manipulator sensor: vision, proximity, touch, slip, force, compliance and force controlled robots. Computer control of robots, command languages. Introduction to intelligent robots. Project on selected topics of current interest.

ENGR 7461 Avionic Systems Design (4 credits)
Prerequisite: ENGR 6461.
Definitions, purpose, history and evolution of avionic systems; cockpit displays configurations, classifications, and design considerations; ARINC communication bus system standards; air data computer system; navigation systems; automatic flight control systems; monitoring/warning/alert systems; flight management systems; system integration; advanced concepts and future trends. Projects on selected topics.

ENGR 7521 Advanced Matrix Analysis of Structures (4 credits)
Prerequisite: ENGR 6511.
Displacement method for two- and three-dimensional analysis of structures. Nonlinear large displacement analysis by stiffness method. Matrix formulations of vibration and stability problems. Computer applications. A project.

ENGR 7531 Boundary Element Method in Applied Mechanics (4 credits)
Boundary integral formulations of Axi-Symmetric, two- and three-dimensional potential and elastostatic problems. Treatment of thermal effects, singularity elements, infinite boundary elements. Coupling of boundary elements and finite elements. Introduction to non-linear, elastostatic problems. Numerical implementation. A case study or a project.

ENGR 791 Topics in Engineering II
See Note in Topic Area E02

ENGR 7961 Industrial "Stage" and Training (6 credits)
Prerequisite: Completion of at least twelve credits in the composite option and at least twenty-one credits in the aerospace program or permission of program director.
This is an integral component of the aerospace program and the composites option in the Mechanical Engineering program that is to be completed under the supervision of an experienced engineer in the facilities of a participating company. The topic is to be decided by a mutual agreement between the student, the participating company and the program director. The course is graded on the basis of the student's performance during the work period, which includes a technical report.

ENGR 8901 Master of Applied Science Research and Thesis (29 credits)
See Requirements for the Degree in Engineering Programs section.

ENGR 8911 Doctoral Research and Thesis (70 credits)
See Requirements for the Degree in Engineering Programs section.

Information Systems Engineering

INSE 6100 Advanced Java Platforms (4 credits)
Prerequisite: Permission of the CIISE is required.
This course emphasizes the architecture and the inner workings of the Java virtual machine; 3 distributions of the Java Platform: the micro-addition, the standard addition and the enterprise addition; the JCP process and the Java standards purposed as API extensions; semantic foundations of Java: static semantics and dynamic semantics. Introduction of technologies that are used to accelerate (performance analysis, hardware accelerators, ahead-of-time, just-in-time, selected dynamic compilation and component-based acceleration) and secure (virtual machines, such as vulnerability analysis, Java security models, byte-code verification, access controllers, security managers, policy files, and certified compilation) Java. Semantic correctness of acceleration and security techniques will also be addressed. A project.

INSE 6110 Foundations of Cryptography (4 credits)
Introduction to cryptography and cryptanalysis, classical ciphers, number-theoretic reference problems, the integer factorization problem, the RSA problem, the quadratic residuosity problem, computing square roots in Zn, the discrete logarithmic problem, the diffie-hellman problem, pseudorandom bits and sequences, stream ciphers: feedback shift registers, LFSRs, RC4. Block Ciphers: SPN and Fiestel structures, DES, AES, linear cryptanalysis, differential cryptanalysis, side channel attacks, ciphertext indistinguishability, attack analysis, IND-CPA, IND-CCA, IND-CCA2, public key encryption: RSA, Rabin, ElGamal, elliptic curves cryptography, hash functions: Un-keyed hash functions, MACs, Attacks, Digital signatures: RSA, Fiat-Shamir, DSA, public key infrastructure, key management, efficient implementation of ciphers, zero-knowledge proof. A project.

INSE 6120 Crypto-Protocol and Network Security (4 credits)
Prerequisite: INSE 6110 or equivalent.
Cryptographic protocols, authentication protocols, key distributions protocols, e-commerce protocols, fair-exchange and contract-signing protocols, security protocol properties: authentication, secrecy, integrity, availability, non-repudiation, atomicity, certified delivery, crypto-protocol attacks, design principles for security protocols, automatic analysis, public key infrastructure, models and architectures for network security, authentication using Kerberos and X.509, email security (PGP, S/MIME), IP security, SSL/TLS protocols, virtual private networks, firewalls intrusion detection, host-based IDS, network based IDS, misuse detection methods, anomaly detection methods, intrusion detection in distributed systems, intrusion detection in wireless ad hoc networks botnet detection, analysis and mitigation, darknet traffic analysis, prediction and forecast of network threats, network security monitoring. A project.

INSE 6130 Operating Systems Security (4 credits)
Prerequisite: INSE 6110 or equivalent.
System security, Windows security, Linux security, Unix security, access control matrix, HRU result, OS security mechanisms, security administration, access control list, capability list, role-based access control, security policy, mandatory and discretionary access control, multi-level security, BLP policy, Biba model, conflict of interest, Chinese Wall policy, secure booting, authentication, password security, challenge response, auditing and logging, system kernel security, threat analysis, security attacks, security hardened operating, host-based intrusion detection, securing network services, firewalls and border security, registry security, embedded and real-time OS security, information flow control. A project.

INSE 6140 Malware Defenses and Application Security (4 credits)
Prerequisite: INSE 6110 or equivalent.
Malicious code, taxonomy, viruses, worms, trojan horses, logical and temporal bombs, infection process, security properties of applications, safety, high level security, detection approaches, ad hoc techniques: scanning, anti-virus technology, obfuscation, dynamic analysis for security: passive and active monitoring, in-line and reference monitors, sandboxing, static analysis for security: data and control flow analysis for security, type-based analysis for security, anti-reverse-engineering protection, software fingerprinting, self-certified code: certifying compilers, proof carrying code, efficient code certification, typed assembly languages, certificate generation, certificate verification and validation, C and C++ security, java security, byte-code verification, access controllers, security managers, permission files, security APIs, critical APIs, protection domains, security profiles, mobile code security. A project.

INSE 6150 Security Evaluation Methodologies (4 credits)
Security evaluation of information systems, security evaluation of software, security evaluation of products. Security code inspection, security testing, security standards, preparation of a security evaluation: impact scale, likelihood scale, severity scale. Vulnerability analysis, risk analysis, security plan elaboration. ITSEC, MARION, and MEHARI methods, OCTAVE, common criteria, target of evaluation, protection profile, security functional requirement, security factors, errors, accidents, assurance requirements, assurance levels, evaluation process, compliance with the protection profile, IT security ethics, privacy, digital copyright, licensing IT security products, computer fraud and abuse, incident handling, business records, security forensics, security evaluation case studies. Information security governance: risk management, business strategy, standards, COBIT. Situation awareness. A project.

INSE 6160 Database Security and Privacy (4 credits)
Prerequisite: INSE 6110 or equivalent.
Access control in relational databases; grant/revoke model; security by views; query modification; Oracle VPD; auditing in databases; information warfare in databases; multi-level database security; polyinstantiation and covert channel; statistical database security; inference control; security by auditing; microdata security; random perturbation; outsourced database security, encrypted databases; SQL injection

attack; anomaly detection in databases; data privacy, P3P; Hippocratic databases; perfect secrecy-based privacy; k-anonymity model; l-diversity; data utility measure, data release with public algorithms, multi-party privacy preserving computation; privacy in OLAP. A project.
Note: Students who have received credit for INSE 691A (Database Security and Privacy) may not take this course for credit.

INSE 6170 Network Security Architecture and Management (4 credits)
Security architecture and management, risk and threats, security attributes and properties, security design principles, security standards, security defence toolkit, and security building blocks, corporate VoIP, residential IPTV, IMS, cloud services, security functions and their implementation, operational considerations of deployment and management of security, configuration, vulnerability management and updates, incident management, emerging challenges and innovative solutions. A project.

INSE 6180 Security and Privacy Implications of Data Mining (4 credits)
Introduction to data mining and its applications; privacy legislations security and privacy threats caused by current data mining techniques; risks and challenges in emerging data mining applications; attacks and prevention methods: web privacy attacks, data mining-based intrusion detection; privacy-preserving data mining; privacy-preserving data publishing. A project.
Note: Students who have received credit for INSE 691D (Security Implications of Data Mining) may not take this course for credit.

INSE 6190 Wireless Network Security (4 credits)
Prerequisite: INSE 6110 or equivalent.
Introduction to wireless network security; security issues in cellular networks; authentication/key management in wireless LAN; secure handover; security in mobile IP; security issues in mobile ad-hoc networks: trust establishment, secure routing, anonymity; anonymous sensory data collection; privacy for smartphone applications. A project.
Note: Students who have received credit for INSE 691B (Wireless Security) may not take this course for credit.

INSE 6210 Total Quality Methodologies in Engineering (4 credits)
Methodologies for quality engineering: six sigma, ACE (Achieving Competitive Excellence), Lean engineering, ISO9000 series; comparative study, quality clinic process charts, relentless root cause analysis, mistake proofing, market feedback analysis, process improvement and waste elimination, visual control, standard work and process management, process certification, setup reduction, total productive maintenance, DMAIC and DMADV processes, define phase, project charter, project scoping and planning, measure phase, critical to quality requirements, quality functional deployment, analyze phase, functional and process requirements, design requirements, design concepts, high-level design capability elaboration and evaluation, design phase, detailed design capability elaboration and evaluation, failure mode and effects analysis, control and

verification plans, verify phase, pilot-scale processes, pilot testing and evaluation, implementation planning, full-scale processes, start-up and testing, performance evaluation, turnover to operations and maintenance, transition to process management, project closure. A project.

INSE 6220 Advanced Statistical Approaches to Quality (4 credits)
Introduction to quality control and total quality, statistical concepts and techniques in quality control, graphical methods for data presentation and quality improvement, statistical basis for control charts, pattern analysis in control charts, control charts for variables, control charts for individual measurements, control charts for attributes, process capability analysis, CUSUM charts and EWMA charts, acceptance sampling by attributes, acceptance plans by variables, reliability models, reliability and life testing plans, multivariate quality control, multivariate methods, aspects of multivariate analysis, multivariate normal distribution, multivariate tests of hypotheses, multivariate analysis of variance, principal components analysis, factor analysis, discrimination and classification, multivariate quality control, multivariate linear regression, design of experiments (DOE), Taguchi method, completely randomized design (CRD), randomized complete block design (RCBD), incomplete block designs, latin square designs, graeco-latin square designs, factorial designs, fractional factorial designs, split plot designs, and nested designs (compared to cross-over designs), quality in the service sector, service industries and their characteristics, model for service quality and applications. A project.

INSE 6230 Total Quality Project Management (4 credits)
Role of a project manager, learning and applications, project management processes, project management in quality initiatives, intellectual property protection, customer project management and critical-to-quality requirements, project planning and execution, team formation, goals, roles, procedures and interpersonal relationship, types of teams, creating a project plan, project tracking, project compliance requirements, sourcing and supplier qualification, government contract data rights, government property, risk management process, action planning, project communication, customer, team and stakeholder communications, communication planning and strategy, web-based collaboration, project management software tools. A project.

INSE 6240 Executive Communication (1 credit)
Communication plan elaboration, preparing presentations, developing a sound strategy, organizing for effectiveness, capturing the audience, the impromptu speech, introducing a speaker, reading a paper, leading a conference, interpersonal communication, use of voice, active listening, assertive speaking, giving and receiving feedback, assertive techniques, work styles, conflict and dispute resolution, negotiation, managing difficult situations, writing skills, interpersonal communications, business letters, formal reports, communication technology. A project.

INSE 6250 Quality Methodologies for Software (4 credits)
Prerequisite: INSE 6210 or equivalent, COMP 5541 or equivalent.

Quality methodologies for software, calculating sigma values, graphical analysis, quality processes for software, MAIC, DMADV, define overview, project context, initial analysis and design, lifecycle and multi-generational planning, project management, risk analysis, measure overview, customer needs, quality functional deployment for software, software metrics and requirements, scorecards, meta-models, specification languages (SDL, B, Z, etc.), software modeling (UML, Core, IDEF, etc.), graphical languages, design and verify overview, failure mode and effect analysis for software, defensive programming, smart and simple design, peer reviews, performance analysis, statistical tools, software testing, software verification. A project.

INSE 6260 Software Quality Assurance (4 credits)
Prerequisite: INSE 6210 or equivalent, COMP 5541 or equivalent.
Quality assurance, quality factors, components of a software quality assurance system, contract review, software development and quality plans, activities and alternatives, integration of quality activities in a project lifecycle, reviews, software inspection, software verification, testing processes, static analysis, control-flow analysis, data-flow analysis, control-flow testing, loop testing, data-flow testing, transaction-flow testing, domain testing, type-based analysis, dynamic analysis, usage models, operational profiles, result and defect analysis, reliability, performance analysis, maintenance and reverse engineering, case tools and software quality assurance. A project.

INSE 6270 Quality-Based System Engineering (4 credits)
Prerequisite: INSE 6210 or equivalent.
System engineering, quality-based system development process, acquisition and specification of system requirements, system design and prototyping, system implementation and testing, modeling languages for system engineering (SysML, IDEF, CORE, etc.), exchange mechanisms for system engineering data (AP233, XMI, etc.) gathering, specification, formulation, and refinement of system requirements, customer requirements, market requirements, technical requirements, implementation requirements, eco-requirements (scenario-based requirements gathering and refinement, affinity diagram, analytic hierarchy analysis), conflict resolution (TRIZ), management of system requirements in the design process (axiomatic design, decision tree, morphology matrix, systematic design), management of system requirements in the implementation process (six-sigma, ACE, Lean, ISO 9000, ERP, SAP, CMMS), case studies. A project.

INSE 6280 Quality Assurance for System Engineering (4 credits)
Prerequisite: INSE 6210 or equivalent, previously or concurrently.
Introduction to quality assurance and quality factors in systems engineering, components of a quality assurance system, principles of verification, validation and accreditation of systems, Vvsystem modeling languages, model semantics, techniques for V principles of system simulation (types of problems, simulation systems and their classification, principles of simulation system design and implementation), verification and validation techniques for simulation models (problem entity, conceptual model, and computerized model),

development of simulation platforms, standards for system simulation, high level architecture (HLA). A project.

INSE 6290 Quality in Supply Chain Design (4 credits)
Evolution of supply chain, lingo, notation, master planning, role in business, performance analysis, activity profiling, strategic quality planning for supply chain, inventory planning and management (IP&M), perfect order percentage, inventory turns, fill rates and substitutions, purchase and customer order cycle times, customer service and order processing (CS&OP), network planning, supply contracts, distribution strategies, coordinated product and supply chain design, quality and innovation in product design, design for maintainability, designing for reliability, environmental considerations in supply chain design, designing quality services, make, buy, and sourcing analysis, supplier partnerships, global sourcing active assembly, supply chain management systems, efficient transportation, efficient warehousing, impact of e-commerce on supply chains, information technology and decision support systems, e-business strategies, e-business transactions, e-commerce platforms for supply chain. A project.

INSE 6300 Quality Assurance in Supply Chain Management (4 credits)
Supply chain management, definition, models, evolution and evaluation, quality attributes, evaluation criteria, key supply chain management issues, supply chain cost reduction opportunities, sales and operating planning hierarchy, gathering data required for sales and operation planning, inventory management techniques, effective supply chain management, supply and demand synchronization, aligning customer demands to order fulfillment, management of supply chain constraints, supply chain performance measurements, supply chain Information, communication, security, information flows, security measures, global supply chain quality and international quality standards, customer driven quality, managing supplier quality in the supply chain, the tools of quality; statistically based quality improvement for variables and attributes; managing quality improvement teams and projects. A project.

INSE 6310 Systems Engineering Maintenance Management (4 credits)
Maintenance concepts in engineering systems; component replacement; optimal component preventive replacement intervals; age-based replacement models for components; spare parts provision; optimal inspection decisions; condition based maintenance systems; proportional hazards model; capital equipment replacement; maintenance resource planning; reliability centered maintenance; equipment degradation analysis; degradation prediction; maintenance information system; maintenance software. A project.
Note: Students who have received credit for INSE 691C (Systems Engineering Maintenance Management) may not take this course for credit.

INSE 6311 Sustainable Infrastructure Planning and Management Systems (4 credits)
This multi-disciplinary course will provide the basic knowledge for developing advanced information systems that can be used to systematically plan and manage infrastructure (e.g. roads and bridges) throughout its lifecycle, including environmental impact assessment. The course will cover the following topics: Definition

and history of Infrastructure, Types and functions of Infrastructure, Infrastructure Planning, Performance Modeling, Failure Analysis and Reliability Issues, Infrastructure Inspection and Monitoring, Maintenance and Rehabilitation Strategies, Environmental Management and Sustainability Issues, and Integrated Infrastructure Management Systems. Projects.

INSE 6320 Risk Analysis for Information and Systems Engineering (4 credits)
Introduction to risk analysis theory. Risk assessment methodologies, risk assessment techniques and standards for information systems, review of probability theory, hazard identification, fault tree analysis, event tree analysis, sensitivity analysis, qualitative risk analysis, quantitative risk analysis, case studies on information systems, value analysis and integrated risk management. A project.
Note: Students who have received credit for INSE 691H (Risk Analysis for Information and Systems Engineering) may not take this course for credit.

INSE 6400 Principles of Systems Engineering (4 credits)
Origins of systems engineering; modern engineering systems; structure of complex systems; systems life cycle; systems engineering management; system decomposition and architecture; systems with uncertain and imperfect information; structural and dynamics modeling; integration and evaluation: production, operation and support; systems engineering decision tools; special topics: systems of systems, sustainability, mass collaboration. A project.

INSE 6411 Product Design Theory and Methodology (4 credits)
This course introduces main design theories and methodologies for the conceptual and configuration design of mechanical/manufacturing systems. It includes the following topics: general design process; introduction to design theory and methodologies; user requirements analysis; structure of design problem; design concept and product configuration generation methods; evaluation of design concepts and product configuration; sources and resolution strategies of design conflicts; computer-assistance of all these tasks; and case studies of product design. A project.

INSE 6421 Systems Integration and Testing (4 credits)
Prerequisite: INSE 6400 or equivalent.
Introduction to integration and testing of complex systems; fundamentals of project planning; process analysis; workflow modeling; six sigma tools and methodologies for systems integration; formulation of systems operational assessment and concept; systems architecture, functions and capabilities composition and packaging into high-level system architecture; modeling and analysis methods for representing system functionality and capability; interface description and management; testability and interoperability testing; management issues pertaining to integrated product teams, vendors, suppliers, and subcontractors. A project.

INSE 6431 Ad Hoc Wireless Networks: Architectures and Protocols (4 credits)
Prerequisite: ELEC 6851, COMP 6461 or equivalent.
Design, provisioning and management of ad hoc wireless networks. Concepts, architectures and protocols related to the efficient design and high performance of ad hoc wireless networks. Medium access control schemes; mathematical analysis. Analysis of access protocols in multihop networks; derive the system capacity. Study of various control knobs for improving the network capacity; power control, physical carrier sense turning, rate control, interference mitigation, and channel diversity. Study emerging issues such as supporting quality of service in wireless networks; security issues in wireless networks, broadband wireless access; wireless mesh networks; their integration with wired networks; vehicular ad hoc networks and related protocols. A project.

INSE 6441 Applied Game Theory and Mechanism Design (4 credits)
Fundamentals of game theory; equilibrium concepts; strategic games; extensive games; Bayesian games; game strategies in network security; game theory for trust and reputation; fundamentals of mechanism design; optimal mechanisms; efficient mechanisms; incentive compatibility; incentives and information security; revelation principle and trust; analysis tools; applications: security protocols, supply chain, trust and reputation, social networks. A project.

INSE 6510 Video Game Technology and Development (4 credits)
Prerequisite: COMP 5511 or equivalent, previously or concurrently.
This course is part development and part technology, and will cover the process of commercial video game development, and software design patterns used for game design. The course provides an in-depth understanding of how the game design process works. Students work with a game engine software framework to design and implement several kinds of games. Video game history. Basic Building blocks of a game. Elements of game design. Game Maker: objects, sprites, events. Space Shooter. Developing games with Games Factory. Real Time Strategy game development. A project.

INSE 6530 3D Graphics and Computer Animation for Game Design (4 credits)
Prerequisite: COMP 6761 or equivalent, previously or concurrently.
Application of 3D graphics and animation topics to non real-time rendered media. Current research topics in computer animation such as dynamic simulation of flexible and rigid objects, automatically-generated control systems, and evolution of behaviours. History of Animation. Animation Basics. Keyframe Animation. Path Animation. Non-Linear Animation. Modeling Concerns for Animation. Rigging for Forward and Inverse Kinematics. Morphing. Expressions. Particle Systems. Dynamics. A project.

INSE 6610 Cybercrime Investigations (4 credits)
Introduction to cybercrimes: unauthorized access, mischief to data, possession of hacking tools, possession of child pornography; Legal aspects: Canadian judicial system, computer crime laws, charter of rights, common law, mutual legal assistance treaty, search warrants, production and assistance orders,

international laws, upcoming legal changes; Investigation process: search planning, acquisition methods, environment recognition, evidence identification; Reporting process: investigation and analysis reports, notes taking; authority of seizure; forensic interviews; Computer crime trials: witness preparation, court sentencing, rebuttal witness, cross-examination, testimony, credibility attacks; in-depth case studies. A project.
Note: Students who have received credit for INSE 691E (Cybercrime Investigations) may not take this course for credit.

INSE 6620 Cloud Computing Security and Privacy (4 credits)
Prerequisite: INSE 6110 or equivalent.
Cloud computing concepts, SOA and cloud, virtualization and cloud, cloud service delivery models, cloud storage models, cloud deployment scenarios, public/ private/ hybrid/ community cloud, cloud computing architectures, SaaS, PaaS, IaaS, agility, scalability and elasticity of cloud, cloud security, cloud privacy, homomorphic encryption, searching encrypted cloud data, secure data outsourcing, secure computation outsourcing, proof of data possession / retrievability, virtual machine security, trusted computing in clouds, cloud-centric regulatory compliance, business and security risk models, cloud user security, identity management in cloud, SAML, applications of secure cloud computing.

INSE 6630 Recent Developments in Information Systems Security (4 credits)
Prerequisites: Any two of INSE 6110, INSE 6120, INSE 6130, or INSE 6140.
Security and privacy legislations. New security threats and solution on personal computers, enterprise computers, personal information, confidential information, identity fraud, financial fraud, and social networking. Recent developments in trusted computing for critical cyber infrastructure, privacy-aware information sharing, cybercrime, and cyber forensics techniques. Cyber espionage, cyber terrorism, and cyber war. A project.

INSE 6640 Smart Grids and Control System Security (4 credits)
Overview of electric grid operation, evolution to the smart grid, smart grid components, dynamic pricing, promotion of “green” resources, governmental regulation, network standards, consumer privacy, risks to the smart grid, physical security and protections against tampering for smart grid environments, device level security, authorization and access control, consumer privacy protection, cryptographic mechanisms for smart grid environments, secure key management, communication security in smart grid, privacy of user data for Advanced Metering Infrastructure (AMI), security standards for smart grid, supervisory control and data acquisition (SCADA), SCADA architecture, SCADA Security, SCADA monitoring, SCADA systems for smart grids, distributed control systems (DCS), communication infrastructure. A project.

INSE 6650 Trusted Computing (4 credits)
Hardware and software root of trust; establishing and attesting trust of software systems; Trusted Platform Module (TPM); CPU support for trusted computing, including existing technologies such as Intel Trusted

Execution Technology (TXT), AMD Secure Virtual Machine (SVM), ARM TrustZone; secure crypto processors such as Hardware Security Modules (HSMs); bank HSM APIs and their weaknesses; attestation protocols; OS support for trusted computing; security tokens (e.g., second factor of authentication, smartcards, transaction verification code); trusted user interface; use cases: digital rights management (DRM), authentication, protected execution of security sensitive code, trusted kiosk computing, full disk encryption, malware exploiting trusted computing infrastructure; hardware and software attacks; privacy issues. A project.

INSE 691 Topics in Information Systems Engineering (4 credits)
Note: Subject will vary from term to term and from year to year. Students may re-register for these courses providing that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g., INSE 691A, INSE 691B, etc.

INSE 6961 Graduate Seminar in Information and Systems Engineering (1 credit)
Students must attend a set of seminars identified by the Concordia Institute for Information Systems Engineering and submit a comprehensive report on the topics presented in three of the seminars. This course is graded on a pass/fail basis.

INSE 7100 Design and Analysis of Security Protocols (4 credits)
Prerequisite: COEN 6311 or equivalent.
The primary objective of this course is to present the methods used in the design and analysis of modern security protocols, introduction to existing cryptographic protocols. The most important security proprieties (such as authentication, secrecy, integrity, availability, atomicity, certified delivery and other properties), flaw taxonomy (such as freshness attacks, type attacks, parallel session attacks, implementation dependent attacks, binding attacks, encapsulation attacks and other forms of attack). Cryptographic protocol specification (general-purpose formal languages, logical languages, operational languages and security calculi). Cryptographic protocol analysis (security logics analysis, model-based and algebraic analysis, process algebra analysis, type based analysis). Limitations of formal methods and ad-hoc techniques, project will be offered in analyzing a number of published cryptographic protocols. The focus of this course will be on the design and the analysis of security protocols. A project.

INSE 7110 Value Added Service Engineering in Next Generation Networks (4 credits)
Prerequisite: ELEC 6861 or equivalent.
Telecommunications service engineering, or more simply service engineering, is the discipline that addresses the technologies and engineering process for the specification, implementation, testing, deployment, usage of value added services in telecommunication networks, value added services, or more simply services, can be defined as anything that goes beyond two party voice calls. They are either call related (e.g. call diversion, multiparty gaming, conducted conferences) or non-call related (e.g. customized stock quotes, web surfing from a cellular phone). Some services may combine call related and non-call related features

(e.g. call centres). This course will cover the basics of service engineering (such as basic concepts, value added services, service life cycle, service engineering, intelligent networks, WAP/Imode/TINE-C). The basics of next generation networks (such as session initiation protocol (SIP), H.323, Megaco, H.248, 3GPP/3GPP2 architecture, softswitch). Signaling protocol-specific approaches (such as H.232 supplementary services, SIP CGI, SIP servlet API). Signaling protocol neutral approaches (such as CPL, JAIN JCC/JCAT, PARLAY; web services). Approaches at the research stage (such as context awareness; mobile code-based approaches). A project.

INSE 7120 Advanced Network Management (4 credits)
Prerequisite: ELEC 6861 or equivalent.
Network management – basics (history and basic definitions, management frameworks, functional areas). The simple network management protocol framework (history, protocol architecture, functional architecture, information architecture, RMON, management by delegation, distributed management and JASMIN NIB, case studies). OSI systems management, TNM and other frameworks (OSI communication, information and functional models, TMN functional, physical and information architecture, case study, CORBA based management, web based management, DTMF, JMX). Interoperability issue and in-depth study of a specific functional area overview of known techniques (e.g. dual MIBs), alarm filtering techniques (e.g. artificial intelligence), alarm correlation techniques (e.g. artificial intelligence, coding theory). Approaches still a research level (mobile agent based network management, active network based network management, policy based artwork management, use of SML/web services). A project.

INSE 8901 Master of Applied Science Research and Thesis (25 credits)
Students must complete a 25-credit thesis as part of their degree requirements. The thesis must represent the results of the student's independent work after admission to the program. The proposed topic for the thesis, together with a brief statement outlining the proposed method of treatment, and the arrangement made for faculty supervision, must be approved by the Faculty Graduate Studies Committee. For purposes of registration, this work will be designated as INSE 8901. The thesis will be evaluated by the student's supervisor(s), and at least two examiners appointed by the Faculty Graduate Studies Committee, one of whom shall be external to the student's department.

Mechanical and Industrial Engineering

INDU 691 Topics in Industrial Engineering (4 credits)
Note: Subject matter will vary from term to term and from year to year. Students may re-register for these courses provided that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g. INDU 691A, INDU 691B, etc.

INDU 6111 Theory of Operations Research (4 credits)
Linear programming: examples of linear programming problems; simplex algorithm; degeneracy; cycling and

Bland anti-cycling rules; revised simplex method; duality; dual simplex method; sensitivity analysis; primal-dual method; network optimization: the trans-shipment problem and the network simplex method; transportation and optimal assignment problems. Project: two hours per week.
Note: Students who have taken ENCS 6151 may not receive credit for this course.

INDU 6121 Advanced Operations Research (*) (4 credits)
Mathematical modeling of industrial systems, including manufacturing and service systems, using integer programming (IP), network analysis, dynamic programming, non-linear programming and other optimization models. Introduction to stochastic optimization models. Traditional and advanced techniques to solve those models and industrial problems. Enumerative algorithms for solving IP and dynamic programming problems, post-optimality analysis. Applications in the design and operation of industrial systems. Design project.
Note: Students who have taken ENCS 6211 may not receive credit for this course.

INDU 6131 Graph Theory with System Applications (4 credits)
Basic concepts; trees, circuits and cutsets; Eulerian and Hamiltonian graphs; directed graphs; matrices of a graph, graphs and vector spaces; planarity and duality; connectivity, matching and colouring; flows in networks: max-flow min-cut theorem, minimum cost flows; optimization on graphs: minimum-cost spanning trees, optimum branching and shortest paths. Project: two hours per week.
Note: Students who have taken ENGR 6111 may not receive credit for this course.

INDU 6211 Production Systems and Inventory Control (4 credits)
Integrated production planning and control. Large scale model development for demand forecasting, materials requirements planning and manufacturing resource planning (MRP/MRPII), production-inventory systems, production planning; models for line balancing, lot sizing, dispatching, scheduling, releasing. Models for inventory control, determination of order quantities and safety stocks, inventory replenishment systems. Supply chain management. Just-in-Time systems, lean and Agile manufacturing. A project is required.

INDU 6221 Lean Enterprise (4 credits)
Introduction to principles of the lean enterprise, process management, waste elimination and process variation, five S's and workplace organization, lean analysis tools and performance measurements, Lean Six Sigma, enterprise value stream mapping, visual workplace, lean product development, lean business administration. A project.

INDU 6231 Scheduling Theory (4 credits)
Models for sequencing and scheduling activities including: static and dynamic problems; deterministic and stochastic models. Single machine processing; parallel machine processing; multistage problems including flow-shops and job-shops. Complexity issues. Exact and heuristic solution methods. Average and worst case performance analysis of heuristic methods. Applications in manufacturing environments. Current research

trends. Project: two hours per week.
Note: Students who have taken ENCS 6201 may not receive credit for this course.

INDU 6241 Lean Manufacturing (4 credits)
Introduction to the basic principles and concepts of lean manufacturing; tools of lean manufacturing, including value stream mapping, standardized work, setup reduction; mapping the current state; mixed model value streams; mapping the future state; Takt time, finished goods strategy, continuous flow, level pull, pacemaker, pitch, interval; implementing the future state. A project.

INDU 6311 Discrete System Simulation (4 credits)
Probability theory and queuing theory; discrete and continuous variables and their distributions; deterministic and stochastic models; building valid and credible models. Computer simulation of discrete-change systems subject to uncertainty techniques to verify quality of input data; analysis of output data; determination of simulation run-length and number of replications; random number generations, variance reduction techniques, transient and steady state behaviour; comparison of alternative systems. A project.
Note: Students who have taken ENGR 6491 may not receive credit for this course.

INDU 6331 Advanced Quality Control (4 credits)
Introduction to advanced quality control and improvement concepts. Fundamentals of statistical methods and theoretical basis for quality control methods. Advanced and newly developed quality control and improvement methods such as modified and acceptance charts, multiple stream process control, control charts with adaptive sampling and engineering process control for quality. International standards of acceptance sampling. Economic design and implications of quality control and improvement procedures. A project is required.

INDU 6341 Advanced Concepts in Quality Improvement (*) (4 credits) The foundations of modern quality improvement, scientific basis of quality engineering, statistical experimental design issues such as randomized blocks, factorial designs at two levels, fractional factorial designs at two levels, applications on factorial designs, building models, and explanation and critique of Taguchi's contributions. Project on selected topics.
Note: Students who have taken MECH 6461 may not receive credit for this course.

INDU 6351 System Reliability (4 credits)
Review of probability theory; definition of various measures (reliability, availability, MTTF, etc.) and related probability distributions; reliability evaluation of redundant systems (series, parallel, series-parallel, bridge network, etc.); two and three parameter Weibull analysis; failure data analysis; trend analysis; goodness of fit test (Kolmogorov/Smirnov test); introduction of stress-strength modelling; homogeneous Markov models; reliability evaluation of cold, warm, and hot standby systems; introduction to reliability testing; case

studies. Knowledge of a first course in probability theory is assumed. Project: two hours per week.
Note: Students who have taken ENGR 6451 may not receive credit for this course.

INDU 6411 Human Factors Engineering (*) (4 credits)
Elements of anatomy, physiology and psychology; auditory and visual display engineering; engineering anthropometry; human capabilities and limitations; manual material handling: design of work places, human-machine system design; shift work and jet lag; acquisition and retention of skill; toxicity and hazard; human reliability. Project on a current topic.
Note: Students who have taken MECH 6251 may not receive credit for this course.

INDU 6421 Occupational Safety Engineering (*) (4 credits)
Engineering design for the control of workplace hazards. Occupational injuries and diseases. Codes and standards. Workplace Hazardous Materials Information System (WHMIS). Hazard evaluation and control. Risk assessment. Design of local ventilation systems for control of air borne contaminants: air movement through ducts, pressure losses, fan specification, balancing, hood design, air cleaning systems. Noise and noise protection: propagation of sound, barrier design, boundary surface treatment, enclosures. Project on current topic.
Note: Students who have taken ENGR 6401 may not receive credit for this course.

MECH 6011 Analysis and Design of Pneumatic Systems (4 credits)
Principles and operating characteristics of fluidic elements; modelling of wall attachment; beam deflection; turbulent and vortex amplifiers; design and analysis of microdiaphram and diaphram ejector amplifiers; methods of evaluation performance characteristics of fluid devices; passive fluidic elements; digital and analog fluidic circuit theories and their applications; case studies of fluidic systems. Project on selected topics.

MECH 6021 Design of Industrial Control Systems (*) (4 credits)
Prerequisite: ENGR 6101 or equivalent.
Analog and digital control system design. Analog controller design methods: lead and lag compensators, pole placement, model matching, two-parameter configuration, plant input/output feedback configuration. Introduction to state-space control system. State estimator and state feedback. Introduction to digital control system. Z-transfom. Difference equations. Stability in the Z-domain. Digital implementation of analog controllers. Equivalent digital plant method. Alias signals. Selection of sampling time. PID controller. Project on specific topic or applications.

MECH 6041 Virtual Systems Engineering (4 credits)
Prerequisite: Permission of the instructor.
Theory and application of virtual systems with an emphasis on virtual prototyping of mechanical systems. Virtual system modelling: particle systems, rigid body systems, lumped parameter models, and multi-domain

system modelling. Non-real-time simulation methods: numerical integration methods, stiff systems and implicit methods. Hardware-in-the-loop simulation (HIL): Real-time simulation, multi-rate simulation and scheduling. Stability, invariance, and robustness. Virtual environments. Distributed simulation and time delay analysis. Design and analysis of virtual engineering systems: specification, design, verification, validation and prototype testing. A project.

MECH 6051 Process Dynamics and Control (*) (4 credits)
Dynamics of mechanical and chemical processes: linear and nonlinear system capacity, resistance, piping complexes; characteristics and dynamics of control valves; process time constants; proportional, reset and derivative control actions; feed forward and cascade control, direct digital control case studies on design of level control; p-4 control and heat exchanger control; analysis of industrial hazards and security. Project on selected topics of current interest.

MECH 6061 Analysis and Design of Hydraulic Control Systems (*) (4 credits)
Introduction to fluid power control technology; fundamentals of fluid transmission media; basic hydraulic control system components and circuits; hydraulic servosystems; modeling and dynamic analysis of hydraulic systems – design examples; basic pneumatic control system components and circuits – design examples. Projects on selected topics.

MECH 6081 Fuel Control Systems for Combustion Engines (4 credits)
Prerequisite: ENGR 6201.
Introduction to fuel control systems for combustion engines with fuel injection. Dynamics of fuel injection for steady-state and transient process; injection characteristics for different combustion patterns; speed and power control in relation to engine characteristics; design principles of fuel systems; special requirements for starting, shut-down, schedule modulation; testing methods; wear and reliability problems. Case studies include: multicylinder in-line injection pump, rotary distributor injection pump, mecano-pneumatic fuel control unit. Full term project work on alternative fuel delivery systems and emissions control for combustion engines. Modelling and simulation. Demonstration of alternative fuel injection system on diesel engine in lab.

MECH 6091 Flight Control Systems (4 credits)
Prerequisite: ENGR 6101 or equivalent.
Basics of flight dynamics modeling: axes systems and notation; equations of motion; aerodynamic forces and moments, airplane stability, aircraft on the ground; simulator flight model design. Flight instruments: classification; principles of operation, cockpit displays. Flight controls basics: configuration; control forces; primary and secondary controls. Introduction to automatic flight control: stability augmentation; autopilots; flight guidance and flight management systems; design examples. Flight simulation: classification; standards and regulations; system configuration and components. Projects on selected topics.

MECH 6101 Kinetic Theory of Gases (4 credits)
Equations of state for gases; molecular explanation of equations of state; introduction to quantum mechanics; the molecular theory of thermal energy and heat capacity; molecular velocity distribution, molecular collisions and the transport properties of gases, introduction to chemical kinetics. Project on specific topic or applications.

MECH 6111 Gas Dynamics (*) (4 credits)
Combined effects in one-dimensional flow; multidimensional flow; method of characteristics; one-dimensional treatment of non-steady gas dynamics; shock wave interactions; instability phenomena of supersonic intake diffusers; shock-boundary layer interactions. Projects on unsteady gas dynamics and on shock wave propagation and interactions.

MECH 6121 Aerodynamics (*) (4 credits)
Prerequisite: ENGR 6201.
Flow conservation equations, incompressible Navier-Stokes equations, inviscid irrotational and rotational flows: the Euler equations, the potential and stream function equations. Kelvin, Stokes and Helmholtz theorems. Elementary flows and their superposition, panel method for non-lifting bodies. Airfoil and wing characteristics, aerodynamics forces and moments coefficients. Flow around thin airfoils, Biot-Savart law, vortex sheets. Flow around thick airfoils, the panel method for lifting bodies. Flow around wings, Prandtl's lifting line theory, induced angle and downwash, unswept wings, swept compressibility correction rules, the area rule. Transonic flow: small disturbance equation, full potential equation, supercritical airfoils. Project on specific topic or applications.

MECH 6131 Conduction and Radiation Heat Transfer (4 credits)
Solutions by analytical, numerical, and analogue methods of steady and transient temperature fields with and without heat sources; introduction to convection. Basic concepts and relations of radiation heat transfer, radiation of strongly absorbing media, and radiation of weakly absorbing media. Project on selected topics.

MECH 6141 Heat Exchanger Design (4 credits)
Review of heat transfer and flow losses; design consideration of heat exchangers; double pipe exchanger; shell and tube exchanger; extended surfaces; condenser, evaporator, regenerator, cooling tower. Project on selected topics.

MECH 6161 Gas Turbine Design (*) (4 credits)
Prerequisite: MECH 6171.
Study of practical criteria which influence the design of a gas turbine engine including relevant mechanical and aerodynamic constraints. The aerodynamics of each of the three major components of a modern turbo-fan engine, namely the compressor, the combustor and the turbine is considered. Air system acoustics,

engine aerodynamic matching of components and modern performance testing methods. A design project is assigned for each of these components. Project on specific topic or applications.

MECH 6171 Turbomachinery and Propulsion (*) (4 credits)
Prerequisite: ENGR 6201.
Review of the gas turbine engine cycle and components arrangement. Types of turbo-propulsion for aircraft: turboprop, turbofan and turbojet. Energy transfer in incompressible and compressible turbomachines: the Euler equation, velocity triangles. Axial-flow compressors; mean-line analysis. Mechanisms of losses in turbomachines. Three-dimensional motion in turbomachines; the radial equilibrium equation and its numerical solution by finite difference methods. Dimensional analysis of incompressible and compressible flow in turbomachines, compressor and turbine performance maps; surge and stall. Centrifugal compressors. Axial-flow turbines. Prediction of performance of gas turbines, components matching. Projects on selected topics.

MECH 6181 Heating, Air Conditioning and Ventilation (4 credits)
The effect of air temperature, humidity and purity on physiological comfort; overall heat transmission coefficients of building sections, air infiltration, ventilation and solar radiation loads; heating and air conditioning load calculations; heating, air conditioning and ventilating systems, equipment and controls; design of hot water piping and air distribution systems, pressure drop calculations; selection and specifications of mechanical equipment for heating, ventilation and air conditioning applications. Project on selected applications.

MECH 6191 Combustion (4 credits)
Prerequisite: MECH 6111.
Chemical thermodynamics; review of chemical kinetics; conservation equations for multicomponent reacting systems; detonation and deflagration of premixed materials; premixed laminar flames; gaseous diffusion flames, droplet combustion; turbulent flames; two-phase reacting systems; chemically reacting boundary layers. Projects on selected topics.

MECH 6231 Helicopter Flight Dynamics (4 credits)
Prerequisites: ENGR 6311 and MECH 6121, previously or concurrently.
Fundamental aspects of helicopter technology; rotary wing aerodynamics; aeromechanical stability; hover and forward flight performance; ground and air resonance; introduction to vibration and structural dynamic problems in helicopter; case studies in the rotorcraft field. Case studies and projects on selected topics.

MECH 6241 Operational Performance of Aircraft (4 credits)
Prerequisite: MECH 6121.
Introduction to fixed-wing aircraft operation. Flying environment and its measurement by aircraft instrumentation. Computation of lift and drag, effects of viscosity and compressibility. Review of piston,

turboprop, turbojet and turbofan powerplants. Operational performance of aircraft in climb, cruise, descent and on ground. Advanced aircraft systems. Operational considerations in aircraft design. Projects on selected topics.

MECH 6251 Space Flight Mechanics and Propulsion Systems (4 credits)
Prerequisite: MECH 6111 or permission of the instructor.
Classification of space propulsion systems; Tsiolkovskij's equation; ideal rocket and nozzle design; flight performance; basic orbital mechanics; chemical propellant rocket performance analysis; fundamentals of liquid and solid propellant rocket motors; electric, solar, fusion thruster. A project.
Note: Students who have taken MECH 7221 may not receive credit for this course.

MECH 6301 Vibration Problems in Rotating Machinery (4 credits)
Prerequisite: ENGR 6311.
Torsional vibrations critical speeds, rotors driven by reciprocating machines, finite element modelling, whirling of shafts, gyroscopic effects, rotors on fluid film bearings, instability in torsional and bending vibrations, balancing, response to support excitations, condition monitoring. Projects on selected applications.

MECH 6311 Noise and Vibration Control (4 credits)
Prerequisite: ENGR 6311.
Introduction to noise and vibration, measurement units. Review of wave theory, noise control criteria and standards, sources and nature of mechanical equipment noise, devices for noise control such as silencers, baffles and acoustic enclosures. Machinery vibration sources, radiation of noise from vibrating structures, devices and methods for vibration control such as isolators, dampers, absorbers and in-situ balancing. Active control of noise and vibration. Projects on selected applications.

MECH 6321 Optimum Design of Mechanical Systems (4 credits)
Survey of practical methods for optimum design of mechanical systems; optimal performance criteria and selection of design variables. Introduction to analytical and numerical optimization methods for single- and multi-variable unconstrained problems: direct search and gradient methods. Constrained optimization. Optimality criterion techniques for mechanical systems. Case studies in the area of machine tools, structural systems, machine element design, vehicle design, and hydraulic control systems. Discussion on commercial software packages, their capability, availability and limitations. Optimization project on selected topics.

MECH 6351 Modal Analysis of Mechanical Systems (4 credits)
Prerequisite: ENGR 6311.
Natural frequencies and normal modes of multi-degree-of-freedom systems; orthogonality of normal modes; eigenvalue and eigenvector extraction methods; vibration response using normal mode analysis; complex natural frequencies and complex modes in damped systems, modal damping random response

considerations; nonsymmetric systems using biorthogonality relations; modal parameter identification from tests, application of modal analysis to mechanical systems. Projects on selected applications.

MECH 6361 Mechanics of Biological Tissues (4 credits)
The course deals with mechanical behaviour of tissues in human body such as bone, cartilage, ligaments, tendons, blood vessels, muscles, skin, teeth, nerves. Classification of biological tissues; mechanical properties in vivo and in vitro testing; constitutive relationships, viscoelastic behaviour and rate/time dependency; remodelling and adaption due to mechanical loading; analogous mechanical systems. Project on current topic.

MECH 6371 Design and Fabrication of Microsystems and Devices (4 credits)
Introduction to microsystems and devices; mechanical properties of materials used in microsystems; microfabrication and post-processing techniques; sacrificial and structural layers; lithography, deposition and etching; introduction and design of different types of sensors and actuators; micromotors and other microdevices; mechanical design, finite element modelling; design and fabrication of free-standing structures; microbearings; special techniques: double sided lithography, electrochemical milling, laser machining, LIGA, influence of IC fabrication methods on mechanical properties; application examples in biomedical, industrial and space technology areas; integration, bonding and packaging of MEMS devices. This course includes a project.

MECH 6421 Metal Machining and Surface Technology (4 credits)
Theoretical and practical aspects of mechanics and dynamics of metal machining; tool geometry in machine and working reference systems with their transformation matrices; machinability; wear; cutting forces; temperature distribution; tool material unconventional machining; machining economics; optimizing techniques for cutting conditions; surface mechanics and application of random processes. Project on selected topics.

MECH 6431 Introduction to Tribology (Wear, Friction and Lubrication) (4 credits)
Contact between stationary surfaces; dry friction; rolling contract; wear; boundary lubrication; lubricating oils and greases; hydrodynamic journal bearings; case studies in Tribology as applied to design and manufacturing problems. Project on specific topic or applications.

MECH 6441 Stress Analysis in Mechanical Design (4 credits)
Stress analysis for design of elastic and visco-elastic mechanical components subject to thermal, fatigue, vibrational and chemical environments; buckling and creep; cumulative damage. Case studies, and project from selected applications.

MECH 6451 Computer-Aided Mechanical Design (4 credits)
Concept of value and decision theory in design; design application and case studies in the implementation of

digital computer-oriented design of engineering systems. Examples include design of specific machine elements, design of vehicle suspension, hydraulic positioning systems, ship propulsion system, multi-speed gear box, and cam drives. Introduction to identification, optimization, and parameter sensitivity. Implementation of these methods uses remote terminals and graphic display units. A project.

MECH 6471 Aircraft Structures (4 credits)
Prerequisite: MECH 6441 or equivalent.
Aero/performance aspects of aircraft structures; Airworthiness and design considerations; Materials; Static, vibratory and

aeroelastic loadings; Propulsion-induced loadings; Functions and fabrication of structural components; Stress analysis of wings, fuselages, stringers, fuselage frames, wing ribs, cut-outs in wings and fuselages, and laminated structures; Buckling of aircraft structures: local buckling, instability of stiffened panels; flexural-torsional buckling; Fracture and fatigue failures. Case studies.

MECH 6481 Aeroelasticity (4 credits)
Aerodynamic loading of elastic airfoils; phenomenon of divergence; effect of flexible control surface on divergence of main structure; divergence of one- and two-dimensional wing models; phenomenon of flutter; flutter of two- and three-dimensional wings; approximate analysis techniques; flutter prevention and control; panel flutter in high speed vehicles; flutter of turbomachine bladings; vortex induced oscillations; bridge buffeting. Project on specific applications.

MECH 6491 Engineering Metrology and Measurement Systems (4 credits)
Introduction to metrology, linear and geometric tolerancing, non-optical and optical methods in form measurement, fundamentals of optical metrology, interferometry - theory and overview, Moiré and phase shifting interfereometry, speckle interferometry and holography, light sources, detectors and imaging systems. Applications to precision measurement, Doppler vibrometry and dynamic characterization, applications to MEMS (Micro-Electro-Mechanical Systems), and special topics include: nanometrology, X-ray interferometry and interference spectroscopy. A project.

MECH 6501 Advanced Materials (4 credits)
Advanced composites. Polymer matrix composites. Resins and fibers. Metal matrix composites. Ceramic matrix composites. Interfaces. Mechanical properties. Applications. Project on selected topics of current interest.

MECH 6511 Mechanical Forming of Metals (*) (4 credits)
Mechanisms of plastic deformation at ambient and elevated temperatures; plasticity theory; mechanical forming processes; forging; rolling; extrusion; wire drawing; deep drawing; bending; results of processing; mechanical properties; residual stresses; fibrous textures and preferred orientations; effects of annealing.

Process modelling by shearline or finite element analysis. Project on current research topics and selected applications.

MECH 6521 Manufacturing of Composites (4 credits)
Hand lay-up. Autoclave curing. Compression molding. Filament winding. Resin transfer molding. Braiding. Injection molding. Cutting. Joining. Thermoset and thermoplastic composites. Process modelling and computer simulation. Nondestructive evaluation techniques. Project on selected topics of current interest.

MECH 6531 Casting (4 credits)
Phase equilibrium diagrams; mechanisms of solidification; design of castings for various moulding processes, section sizes, dimensional accuracies and surface finishes; continuous casting; control of grain size; segregation and porosity. Defects in castings. Project on current research topic and selected applications.

MECH 6541 Joining Processes and Nondestructive Testing (4 credits)
Principles of joining; fusion welding; arc, torch, plasma, electron beam, resistance, etc; solid state welding; heterogeneous hot joining (brazing, soldering); heterogeneous cold joining; metallurgy of joints; joint properties; nondestructive testing processes; radiography, ultrasonic, magnetic particle, die penetrant, etc. Project on current research topic or selected applications.

MECH 6551 Fracture (4 credits)
Fracture mechanisms; ductile and cleavage; brittle fracture; notch effects; propagation of cracks; ductile-brittle transition; inter-granular fracture; hydrogen embrittlement; fatigue initiation mechanisms; crack propagation; preventive design; creep failure, mechanisms maps, fatigue; pore formation; grain boundary sliding; high temperature alloys, testing techniques; fractography. Project on current research topics and selected applications.

MECH 6561 High Strength Materials (4 credits)
Studies of the microstructures responsible for high strength and of the thermomechanical treatments producing these microstructures; dislocation theory; strain hardening; strengthening by solid-solution, massive hard phases, precipitation, dispersed particles, and martensitic and bainitic structures; fibre and particulate composites; surface treatments; residual stresses of thermal or mechanical origin. Project on current research topics and selected applications.

MECH 6571 Corrosion and Oxidation of Metals (4 credits)
Electrochemical corrosion and preventative measures. Stress corrosion, corrosion fatigue. Oxidation at low and high temperatures and protective measures. Selection of alloys and coatings. Project on current research topic or selected applications.

MECH 6581 Mechanical Behaviour of Polymer Composite Materials (4 credits)
General applications of polymer composite materials in the aircraft, aerospace, automobile, marine, recreational and chemical processing industries. Different fibres and resins. Mechanics of a unidirectional lamina. Transformation of stress, strain, modulus and compliance. Off-axis engineering constants, shear and normal coupling coefficients. In-plane and flexural stiffness and compliance of different laminates including cross-ply, angle-ply, quasi-isotropic and general bidirectional laminates. Strength of laminates and failure criteria. Micro-mechanics. Projects on selected applications.

MECH 6601 Testing and Evaluation of Polymer Composite Materials and Structures (4 credits)
Theory and practice for the determination of tensile, compression and shear properties of composite materials; techniques for the determination of physical and chemical properties; non-destructive techniques such as ultrasonics, acousto-ultrasonics, acoustic emission, infrared and lasers for evaluation of composite structures. Project on selected topics of current interest.

MECH 6611 Numerically Controlled Machines (4 credits)
Prerequisite: MECH 6451 or equivalent.
Positioning and contouring NC machines, typical NC applications; analysis of typical NC systems and design considerations; components. Design project on multi-surface machine parts.

MECH 6621 Microprocessors and Applications (*) (4 credits)
Prerequisite: A course in industrial electronics or permission of the instructor.
Introduction to the concepts and practices of using microprocessors and micro-computers in such applications as instrumentation, manufacturing, control and automation; architecture and programming techniques; interface logic circuits; I/O systems; case studies of mechanical engineering applications. Project on specific topic or applications.

MECH 6631 Industrial Automation (4 credits)
Introduction to mechanization of industrial processes such as machining, material handling, assembling, and quality control; selection of actuators and sensors for mechanization; design of sequential control circuits using classical methods, ladder diagram, travel-step diagram and cascade method; specifying control sequences using GRAFCET and FUP; special purpose circuits such as emergency circuits, timers, and programmable logic controllers (PLCs); case studies dealing with typical industrial manufacturing processes and computer simulation. Project on specific topic or applications.

MECH 6641 Engineering Fracture Mechanics and Fatigue (4 credits)
Fracture mechanics and fatigue of machine elements and structures; Linear Elastic Fracture Mechanics (LEFM); Elastic Plastic Fracture Mechanics (EPFM); Finite Element Analysis for fracture; LEFM and EPFM Testing; Fracture mechanics approach to fatigue crack growth problem; Constant-amplitude, variable-amplitude and stochastic loading cases; Industrial applications to mechanical design and fracture and fatigue

control in machine elements and structures; Damage tolerance design. Case study or project on selected applications.

MECH 6651 Structural Composites (4 credits)
Analysis for design of beams, columns, rods, plates, sandwich panels and shells made of composites; anisotropic elasticity; energy methods; vibration and buckling; local buckling in sandwich structures; free edge effects and delamination; joining; and failure considerations in design. Project on selected applications.

MECH 6661 Thermodynamics and Phase Equilibria of Materials (4 credits)
Thermodynamic laws and relationships. Partial and relative state functions: Activities in multicomponent systems, reference and standard states, solution thermodynamics. Thermodynamics of phase transformations and chemical reactions in engineering materials. Calculation of thermodynamic functions and properties. Experimental methods of determining thermodynamic properties. Multicomponent and multiphasic systems. Generalized phase rules, phase diagrams, stability diagrams and other diagram types. Computational thermodynamics for developing engineering materials. A project.

MECH 6671 Finite Element Method in Machine Design (4 credits)
Prerequisite: MECH 6441.
Role of Finite element method in machine design. Variational principles. Formulation of the finite element problem in stress, vibration and buckling analyses of machine components. Different elements and interpolation functions. Application in machine design; fracture. Case study or project on selected applications.

MECH 6681 Dynamics and Control of Nonholonomic Systems (4 credits)
Kinematics of nonholonomic systems; dynamics of nonholonomic systems, including d'Álembert principle, Euler-Lagrange equations; equations of motion of nonholonomic systems with Lagrangian multipliers; the reaction of ideal nonholonomic constraints; nonholonomic Caplygin systems; Bifurcation and stability analysis of the nonholonomic systems. Analysis and design of nonlinear control of nonholonomic systems, including kinematic control and dynamic control as well as force control. Controller designs with uncertain nonholonomic systems. Application examples including control of wheeled mobile robots and walking robots. A project.

MECH 6691 Optical Microsystems (4 credits)
Microfabrication and micromachining required for optical microsystems; optical microsystem modeling, simulation, sensitivity analysis. Properties of materials suitable for optical MEMS (Micro-Electro-Mechanical Systems). Measurements, sensing and actuation suitable for optical microsystems. Introduction to micro-optical components; optical waveguide-based systems. Design of different optical MEMS devices. Chemical

and biochemical sensing with optical microsystems. Assembly, packaging and testing of optical MEMS devices. A Project.

MECH 6741 Mechatronics (4 credits)
Introduction to mechatronics; basic elements of mechatronic systems. Measurement systems: including principles of measurement systems; sensors and transducers; signal conditioning processes and circuits; filters and data acquisition. Actuation systems: mechanical actuation systems and electrical actuation systems. Controllers: control modes; PID controller; performance measures; introduction to digital controllers and robust control. Modeling and analysis of mechatronic systems; performance measures; frequency response; transient response analysis; stability analysis. A project.

MECH 6751 Vehicle Dynamics (4 credits)
Tire-terrain interactions; side-slip; cornering and aligning properties of tires: camber angle and camber torque; estimation of braking-tractive and cornering forces of tires; steady-state handling of road vehicles: steering response and directional stability; handling and directional response of vehicles with multiple steerable axles: handling of articulated vehicles: handling and directional response of tracked and wheeled off-road vehicles; directional response to simultaneous braking and steering. Project on research topics.

MECH 6761 Vehicular Internal Combustion Engines (*) (4 credits)
Mechanical design of vehicular engines; gas exchange and combustion engine processes; combustion chambers design; fuels and fuel supply; ignition and control systems; cooling and lubrication of engines; emissions formation and control; engine operational characteristics - matching with vehicles; enhancement of engine performance; engine testing; environmental impact of vehicular engines; recent developments in energy-efficient and “clean” engines. Design of calculation project of vehicular engine. Project work on alternative fuel delivering systems and emissions control for combusion engines. Modeling and simulation. Demonstration of alternative fuel injection system on diesel engine in lab.

MECH 6771 Driverless Ground Vehicles (*) (4 credits)
Definition and classifications; case studies of major industrial and research vehicle prototypes; applications; kinematic modelling for feedback control of a driverless vehicle as a planar rigid body; vehicle motion and its relation to steering and drive rates of its wheels; co-ordinate systems assignment; transformation matrices; condition for rolling without skidding and sliding; sensor models and sensor integrations; dead-reckoning control; global and local path planning; introduction to dynamic modelling of driverless vehicle with and without the dynamics of wheel assemblies; design of optimal controllers; introduction to adaptive neuro-morphic controller. Projects are an integral part of the course for which the following may be used: TUTSIM, FORTRAM, or C. Project on selected topics.

MECH 6781 Guided Vehicle Systems (*) (4 credits)
Definition and classification of guided transportation systems; track characterization: alignment, gage,

profile and cross-level irregularities; wheel-rail interactions: rolling contact theories, creep forces; modeling of guided vehicle components; wheelset, suspension, truck and car body configurations, suspension characteristics; performance evaluation: stability/hunting, ride quality; introduction to advanced guided vehicles. Project on selected topics is an integral part of the course.

MECH 691 Topics in Mechanical Engineering I (4 credits)
See Note in Topic Area E02

MECH 6941 Concurrent Engineering in Aerospace Systems (4 credits)
Introduction: objectives, definitions, impact on product development; process modeling and optimization; forming of engineering team; selection of techniques, methodology and tools; market design focus vs. quality design focus; development time management; process integration; aerospace case studies/projects, future trends.

MECH 6961 Aerospace Case Study I
See Mechanical & Industrial Engineering section.

MECH 6971 Aerospace Case Study II
See Mechanical & Industrial Engineering section.

Note: MECH 6961 and MECH 6971 are restricted to students registered in aerospace engineering programs at Concordia or participating universities. These courses cover topical case studies drawn from aerospace industrial experience. They are conducted in a modular form by experienced engineers who specialize in one or more facets of this industry. They are given in collaboration with the other participating universities and may be conducted at any of the Montreal universities in the language of convenience to the instructor.

MECH 7011 Dynamics of Hydraulic Control Systems (4 credits)
Prerequisites: MECH 6021, 6061.
Review of hydraulic control system technology and the need for dynamic analyses. Conventional techniques for assuring good response by analysis. Power flow modelling, power bond graphs, and digital simulation techniques. Obtaining dynamic relationships and coefficients. Phenomena which can affect dynamic response. Projects on selected topics.

MECH 7101 Convection Heat Transfer (4 credits)
Prerequisite: ENGR 6201.
Heat transfer in laminar flow, review of the differential and integral forms of the general energy equation for boundary layer regimes; solution of the energy equation for free convection, forced convection and heat transfer in entrance regions. Heat transfer in turbulent flow; review of the energy equation for turbulent

flow; momentum-heat transfer analogies; experimental results for forced convection, free convection, and combined free and forced convection. Project or term paper required.

MECH 7501 Design Using Composite Materials (4 credits)
Prerequisite: MECH 6581.
General concept involving design using composite materials. Integral approach to design. Selection of materials. Selection of fabrication techniques. Computer-aided design tools. Consideration for fracture, fatigue, buckling and impact. Joining consideration. Design of tubes, beams, columns. Design of aircraft components. Project on selected topics.

MECH 7511 Vehicle Vibration and Control (4 credits)
Dynamic modelling of ground vehicles for analysis of ride performance; ride comfort and safety criteria; modelling of human body; characterization of road inputs; modelling and design of vibration isolators: primary suspension, secondary suspension; active, semi-active and passive isolators; kinematic and dynamic analysis of suspension linkages; laboratory methods for performance evaluation of vehicle suspension systems; software packages and case studies. Projects on selected applications.

MECH 7711 Handling and Stability of Road Vehicles (4 credits)
Prerequisite: MECH 6751 or equivalent.
Mathematical methods in vehicle dynamics; tire and suspension modelling and design for handling; static roll; steady turning and off-tracking analysis of straight and articulated road vehicles; directional stability and braking analysis; directional response of articulated vehicles with steerable axles; software packages and case studies. Project on selected topics is an integral part of the course.

MECH 791 Topics in Mechanical Engineering II (4 credits)
See Note in Topic Area E02

MECH 8011 Doctoral Seminar in Mechanical Engineering
Grading on a pass/fail basis only. No credit value.

Computer Science and Software Engineering

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Computer Science and Software Engineering Website

Doctor of/Doctorate in Philosophy (Computer Science)
Doctor of/Doctorate in Philosophy (Software Engineering)
Master of/Magisteriate in Computer Science (MCompSc)
Master of/Magisteriate in Applied Computer Science (MApCompSc)
Master of/Magisteriate in Applied Science (Software Engineering)
Master of/Magisteriate in Engineering (Software Engineering)
Diploma in Computer Science

Doctor of/Doctorate in Philosophy (Computer Science)

The requirements for the degree of Doctor of/Doctorate in Philosophy are described in the general section on the Faculty of Engineering and Computer Science

Doctor of/Doctorate in Philosophy (Software Engineering) *

The requirements for the degree of Doctor of/Doctorate in Philosophy are described in the general section on the Faculty of Engineering and Computer Science

Master of/Magisteriate in Computer Science (MCompSc)

Admission Requirements. Applicants to the MCompSc program must hold a Bachelor's degree in computer science or other disciplines such as engineering, sciences, and mathematics with very high standing. Qualified applicants requiring prerequisite courses may be required to take such courses in addition to their regular graduate program.

Requirements for the Degree

- **Program of Study.** A fully qualified candidate is required to complete successfully a minimum of 45 credits. Each individual program of study must be approved by the department.

- **Completion.** Normally a full-time student will require six terms to complete the degree requirements.
- **Transfer Credits.** Students may be granted transfer credits for, in general, not more than 8 credits taken in approved graduate studies prior to their entry in this program. A course submitted for transfer credit must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.
- **Cross-Registration.** A student in the program wishing to take courses under the cross-registration scheme outlined in the graduate calendar must first obtain permission of the graduate program director.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Thesis.** Students must complete a 29-credit thesis as part of their degree requirements. The thesis must represent the results of the student's independent work after admission to the program. The proposed topic for the thesis, together with a brief statement outlining the proposed method of treatment, and the arrangement made for faculty supervision must be approved by the graduate studies committee. For purposes of registration, this work will be designated as COMP 7941 Master's Research and Thesis. The thesis will be evaluated by the student's supervisor(s), and at least two examiners appointed by the graduate studies committee. Students who are admitted before June 1, 2001 may take COMP 7921.

Students must complete 45 credits as shown below:

- **Courses.** Students must complete a minimum of 16 credits of courses. A minimum of 8 credits must be chosen from Topic Areas C01 through C07. Any remaining credits may be chosen from Topic Areas C08 (Developments in Software Engineering), C09 (Software Engineering), C12 (Cognate Disciplines), and COMP 6961. A maximum of 4 credits can be chosen from computer science courses at the 6000 level marked with (*). The student's study program must be approved by the supervisor(s) and either the Graduate Program Director or the Department Chair.
- **Thesis.** 29 credits.

Master of/Magisteriate in Applied Computer Science (MApCompSc)

Admission Requirements. Applicants must hold an undergraduate degree in computer science or a graduate diploma in computer science. Admission to the program is competitive and only applicants with high academic standing will be considered. The graduate studies committee, in consultation with the department, is responsible for recommending on all applications for admission.

Requirements for the Degree

- **Program of Study.** The student, in consultation with faculty, must plan an individual program of study approved by the department graduate studies committee.
- **Credits.** A fully-qualified candidate is required to complete successfully a minimum of 45 credits. Additional credits may be required in some cases.
- **Completion.** Normally a full-time student will require six terms to complete the degree requirements.
- **Transfer Credits.** A student may be granted credit for, in general, not more than 12 credits taken in approved graduate studies prior to his or her entry into this program. A course submitted for transfer credit must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.
- **Cross-Registration.** A student in the program wishing to take courses under the cross-registration scheme outlined in the graduate calendar must first obtain permission of the graduate program director.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Courses.** Students must take a minimum of 45 credits of course work consisting of 20 credits of core courses (COMP 6231, COMP 6461, COMP 6521, COMP 6651, and SOEN 6441) and 25 credits of electives including a minimum of 16 credits from Topic Areas C01 through C07. The electives may include ENCS 6931 or COMP 6961, and a maximum of 8 credits chosen from computer science courses at the 6000 level marked with a (*); 4 credits chosen from COMP 5261 and COMP 5421; and 8 credits from Topic Areas C08 (Topics in Software Engineering), C09 (Software Engineering) and C12 (Cognate Disciplines).

Transitional Arrangements: All students admitted for or after the summer 2001 session will be subject to the new set of degree requirements. Students admitted before the summer 2001 session will retain credits already earned. They will have the choice of either the old or the new set of requirements. Old thesis and project numbers will be retained as a transitional arrangement for these students. The Graduate Program Director and student advisors will assist students in choosing how to meet the old or the new set of requirements. Students are not allowed to enrol in both old and new versions of the same course.

Industrial Experience Option in the Master of Applied Computer Science

Applicants to the Master of Applied Computer Science may apply to the Industrial Experience option in the industrial milieu through the Institute for Co-operative Education. Students should indicate their choice on the application form. The Institute for Co-operative Education will help them with resumes, cover letters and interview techniques. The suggested schedule is as follows: fall and winter terms will be dedicated to course work followed by one term in industry, culminating with two terms in University for the remaining course work. The industrial experience term will be noted on the student transcript/record.

Students apply to the Industrial Experience option as early as possible, preferably when they enter the program. It is preferable to be bilingual in French and English if they wish to work in Quebec. Students who lack good language skills and still want to be part of the program should improve their language skills prior to final acceptance.

Admission Criteria

Students need to be enrolled in the Industrial Experience option at least the semester before going on a work term. They begin applying for jobs the semester prior to the work term. Previous work experience cannot be used toward credit for the ENCS 6931. Students should have good grades (greater than a CGPA of 3.40) for the master's program, be full-time and have good communication skills. A Canadian work permit is required. The Departmental Co-op Program Director will recommend final acceptance to the Industrial Experience option.

ENCS 6931 Industrial Stage and Training (9 credits)
Prerequisite: Completion of at least twenty credits in the program and permission of the Departmental Co-op Program Director.
This is an integral component of the Industrial Experience option that is to be completed under the supervision of an experienced engineer/computer scientist in the facilities of a participating company (a Canadian work permit is required).
Each student receives an assessment from the Departmental Co-op Program Director in consultation with the industry supervisor and the faculty advisor. Grading is on a pass/fail basis based on a proposal, monthly progress reports, a final report and a presentation.

Master of/Magisteriate in Applied Science (Software Engineering)

Admission Requirements. Applicants to the MASc program must hold an undergraduate degree or graduate diploma in software engineering, computer science, or another discipline such as engineering, science, and mathematics with very high standing. Qualified applicants requiring prerequisite courses may be required to take such courses in addition to their regular graduate program.

Requirements for the Degree

- **Program of Study.** A fully qualified candidate is required to complete successfully, a minimum of 45 credits. Each individual program of study must be approved by the Department.
- **Completion.** Normally a full-time student will require six terms to complete the degree requirements.
- **Transfer Credits.** Students may be granted transfer credits for, in general, not more than 8 credits taken in approved graduate studies prior to their entry in this program. A course submitted for

transfer credit must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.

- **Cross-Registration.** A student in the program wishing to take courses under the cross-registration scheme outlined in the graduate calendar must first obtain permission of the graduate program director.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University. The time limit is 15 terms (5 years) for part-time students, however, the Department does not recommend students to register for this program on a part-time basis.
- **Thesis.** Students must complete a 29-credit thesis as part of their degree requirements. The thesis must represent the results of the student's independent work after admission to the program. The proposed topic for the thesis, together with a brief statement outlining the proposed method of treatment, and the arrangement made for faculty supervision must be approved by the graduate studies committee. For purposes of registration, thesis work will be designated as SOEN 7941 Master's Research and Thesis. The thesis will be evaluated by the student's supervisor(s), and at least two examiners appointed by the graduate studies committee, one of whom shall be external to the Department.

Students must complete a minimum of 45 credits as shown below:

- **Courses.** Students must complete a minimum of 16 credits of course work. A minimum of 8 credits must be chosen from Topic Areas C08 (Developments in Software Engineering) and C09 (Software Engineering). Any remaining credits may be chosen from any of the Topic Areas C01 through C09 and C12 (Cognate Disciplines). A maximum of 4 credits can be chosen from computer science courses at the 6000 level marked with (*). The student's study program must be approved by the supervisor(s) and either the Graduate Program Director or the Department Chair.

  Notes: Students who have completed an undergraduate degree in Software Engineering degree may not take SOEN 6011 for credit.

- **Thesis.** 29 credits.

Master of/Magisteriate in Engineering (Software Engineering)

Admission Requirements. Applicants must hold an undergraduate degree or a graduate diploma in Software Engineering with very high standing. In addition, applicants holding an undergraduate degree with very high standing in another discipline such as engineering, science, computer science or mathematics must have at least two years of experience in IT or related industry. Qualified applicants requiring prerequisite courses may be required to take such courses in addition to their regular graduate program. Admission to the

program is competitive and only applicants with high academic standing will be considered. The graduate studies committee, in consultation with the department, is responsible for recommending on all applications for admission.

Note: Students who have not completed an undergraduate degree or a graduate diploma in Software Engineering must take COMP 5541, SOEN 341 and SOEN 390 in addition to the other requirements for the program.

Requirements for the Degree

- **Program of Study.** The student, in consultation with faculty, must plan an individual program of study approved by the department graduate studies committee.
- **Credits.** A fully-qualified candidate is required to complete successfully a minimum of 45 credits. Additional credits may be required in some cases.
- **Completion.** Normally a full-time student will require six terms to complete the degree requirements.
- **Transfer Credits.** A student may be granted credit for, in general, not more than 12 credits taken in approved graduate studies prior to his or her entry into this program. A course submitted for transfer credit must be appropriate to the student's program of study at Concordia University. An application for such credit will be considered only at the time of admission.
- **Cross-Registration.** A student in the program wishing to take courses under the cross-registration scheme outlined in the graduate calendar must first obtain permission of the graduate program director.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Courses.** Students must take a minimum of 45 credits of course work consisting of 20 credits of core courses (SOEN 6431, SOEN 6471, SOEN 6481, SOEN 6841, and INSE 6260), a minimum of 16 credits from Topic Areas C08 and C09, and the remaining credits from Topic Areas C01 through C09, C12, COMP 6961 and ENCS 6931.

List of Courses in Computer Science by Topic Areas

C01 - DEVELOPMENTS IN COMPUTER SCIENCE

COMP 691 Topics in Computer Science I
COMP 791 Topics in Computer Science II

C02 - PARALLEL AND DISTRIBUTED SYSTEMS

COMP 6231 Distributed System Design
COMP 6281 Parallel Programming (*)
COMP 7241 Parallel Algorithms and Architectures
COMP 7251 Mobile Computing and Wireless Networks

C03 - IMAGE PROCESSING/PATTERN RECOGNITION AND GRAPHICS

COMP 6311 Computer Animation (*)
COMP 6321 Machine Learning
COMP 6711 Computational Geometry
COMP 6731 Pattern Recognition (*)
COMP 6761 Advanced 3D Graphics for Game Programming
COMP 6771 Image Processing (*)
COMP 7661 Advanced Rendering and Animation
COMP 7751 Advanced Pattern Recognition
COMP 7781 Advanced Image Processing

C04 - SOFTWARE SYSTEMS AND LANGUAGES

COMP 6411 Comparative Study of Programming Languages
COMP 6421 Compiler Design (*)
COMP 6461 Computer Networks and Protocols
COMP 7451 Semantics of Programming Languages

C05 - INFORMATION PROCESSING AND MANAGEMENT

COMP 6521 Advanced Database Technology and Applications
COMP 6591 Introduction to Knowledge-Base Systems
COMP 6811 Bioinformatics Algorithms
COMP 6821 Bioinformatics Databases and Systems
COMP 7531 Database Systems Principles

C06 - SCIENTIFIC COMPUTATION AND ALGORITHMS

COMP 6351 Topics in Scientific Computation
COMP 6361 Numerical Analysis of Nonlinear Equations
COMP 6621 Discrete Mathematics of Paul Erdös
COMP 6641 Theory of Computation
COMP 6651 Algorithm Design Techniques

COMP 6661 Combinatorial Algorithms
COMP 7521 Cryptography and Data Security
COMP 7651 Advanced Analysis of Algorithms

C07 - ARTIFICIAL INTELLIGENCE AND HUMAN-MACHINE COMMUNICATION

COMP 6531 Foundations of the Semantic Web
COMP 6721 Artificial Intelligence (*)
COMP 6741 Intelligent Systems (*)
COMP 6751 Natural Language Analysis
COMP 6781 Statistical Natural Language Processing
COMP 6791 Information Retrieval (*)

C08 - DEVELOPMENTS IN SOFTWARE ENGINEERING

SOEN 691 Topics in Software Engineering I
SOEN 791 Topics in Software Engineering II

C09 - SOFTWARE ENGINEERING

SOEN 6011 Software Engineering Development Processes
SOEN 6311 Formal Methods (*)
SOEN 6431 Software Comprehension and Maintenance
SOEN 6441 Advanced Programming Practices
SOEN 6461 Software Design Methodologies
SOEN 6471 Advanced Software Architectures
SOEN 6481 Software Systems Requirements Specification
SOEN 6611 Software Measurement
SOEN 6751 Human Computer Interface Design
SOEN 6761 Multimedia Computing
SOEN 6841 Software Project Management
SOEN 6861 Services Computing: Foundations, Design and Implementations
SOEN 6951 Software Engineering Case Study
SOEN 7481 Software Verification and Testing
SOEN 7761 Intelligent User Interfaces

C10 - INDUSTRIAL EXPERIENCE, SEMINAR AND THESIS

COMP 6961 Graduate Seminar in Computer Science (1 credit)
COMP 7941 Master's Research and Thesis (29 credits)
ENCS 6931 Industrial Stage and Training (9 credits)
SOEN 7941 Master's Research and Thesis (29 credits)

C11 - DOCTORAL SEMINAR, RESEARCH, AND THESIS

ENCS 8011 PhD Seminar (2 credits)
ENCS 8511 Doctoral Research Proposal (6 credits)
COMP 8901 Doctoral Research and Thesis (70 credits)
SOEN 8901 Doctoral Research and Thesis (70 credits)
ENCS 8501 Comprehensive Examination
Doctoral students must begin work on ENCS 8501 within 12 (24) months after the first registration as a full-time (part-time) student in a PhD program. This course is graded on a pass/fail basis and has no credit value. For purposes of registration, this work will be designated as ENCS 8501.

C12 - COGNATE DISCIPLINES

Students in a master's program may take courses from Engineering Topic Areas E10, E42, E66, E68 and E70 for credit and also from the course list below, provided that prerequisite requirements are met:

COEN 7311 Protocol Design & Validation
ENCS 6021 Engineering Analysis II
ENCS 6161 Probability and Stochastic Processes
ENCS 6181 Optimization Techniques (*)

Course Descriptions

The following are one-term courses (four credits each) unless otherwise indicated. For additional information concerning course descriptions, prerequisites, and schedules contact the Office of the Associate Dean, Engineering and Computer Science.

Note: Some graduate courses are content equivalent with specific undergraduate courses. These graduate courses, indicated with (*) below, are not available for credit to students who have completed the undergraduate equivalent.

COMP 6231 Distributed System Design (4 credits)
Prerequisite: COMP 5461.
Principles of distributed computing: scalability, transparency, concurrency, consistency, fault tolerance. Client-server interaction technologies: interprocess communication, sockets, group communication, remote

procedure call, remote method invocation, object request broker, CORBA, web services. Distributed server design techniques: process replication, fault tolerance through passive replication, high availability through active replication, coordination and agreement transactions and concurrency control. Designing software fault-tolerant highly available distributed systems using process replication. Laboratory: two hours per week.

COMP 6281 Parallel Programming (*) (4 credits)
Prerequisite: COMP 5461.
Migration from Von Neumann to parallel processing architectures: shared-memory and message-passing paradigms; massively parallel computers; recent trends in commodity parallel processing; clusters, multi-core, CPU-GPU based heterogeneous computing. Issues of memory consistency and load balancing. Parallel algorithms for shared-memory and message passing platforms; efficiency and scalability; issues of performance overhead. Parallel programming environments: parallel programming models; languages; software tools. Laboratory: two hours per week. A project.

COMP 6311 Animation for Computer Games (*) (4 credits)
Prerequisites: COMP 5611; COMP 6761 or equivalent, previously or concurrently.
Introduction to the algorithms, data structures, and techniques used in modelling and rendering dynamic scenes. Topics include principles of traditional animation, production pipeline, animation hardware and software, orientation representation and interpolation, modelling physical and articulated objects, forward and inverse kinematics, motion control and capture, key-frame, procedural, and behavioural animation, camera animation, scripting system, and free-form deformation. A project. Laboratory: two hours per week.

COMP 6321 Machine Learning (4 credits)
Introduction to the fundamentals of machine learning. Linear models: linear and polynomial regression, overfitting, model selection, logistic regression, naive Bayes. Non-linear models: decision trees, instance-based learning, boosting, neural networks. Support vector machines and kernels. Computational learning theory. Experimental methodology, sources of error. Structured models: graphical models, deep belief networks. Unsupervised learning: k-means, mixture models, density estimation, expectation maximization, principle component analysis, eigenmaps and other dimensionality reduction methods. Learning in dynamical systems: hidden Markov models and other types of temporal/sequence models. Reinforcement learning. Survey of machine learning and its applications. A project.
Note: Students who have received credit for COMP 7751 before September 2011 may not take this course for credit.

COMP 6351 Topics in Scientific Computation (4 credits)
Prerequisite: COMP 5611.
Selected elements of numerical methods that are central to scientific computation. The precise contents of the course may differ somewhat from one offering to the next, but will include the following topics: An introduction to the numerical solution of nonlinear equations, continuation methods, numerical solution of

initial value problems in ordinary differential equations, finite difference method, numerical stability theory, stiff equations, boundary value problems in ordinary differential equations, collocation methods, introduction to the numerical solution of partial differential equations, with emphasis on nonlinear diffusion problems. A project.

COMP 6361 Numerical Analysis of Nonlinear Equations (4 credits)
Prerequisite: COMP 5611.
An introduction to numerical algorithms for nonlinear equations, including discrete as well as continuous systems. The emphasis is on computer-aided numerical analysis rather than numerical simulation. This course is suitable for scientists and engineers with a practical interest in nonlinear phenomena. Topics include computational aspects of: homotopy and continuation methods, fixed points and stationary solutions, asymptotic stability, bifurcations, periodic solutions, transition to chaos, conservative systems, travelling wave solutions, discretization techniques. A variety of applications will be considered. Numerical software packages will be available. A project.

COMP 6411 Comparative Study of Programming Languages (4 credits) Comparison of several high-level programming languages with respect to application areas, design, efficiency, and ease of use. The selected languages will demonstrate programming paradigms such as functional, logical, and scripting. Static and dynamic typing. Compilation and interpretation. Advanced implementation techniques. A project.

COMP 6421 Compiler Design (*) (4 credits)
Prerequisites: COMP 5201, COMP 5361; COMP 5511.
Compiler organization and implementation: lexical analysis and parsing, syntax-directed translation, code optimization. Run-time systems. A project.

COMP 6461 Computer Networks and Protocols (4 credits)
Prerequisite: COMP 5461.
Direct link networks: encoding, framing, error detection, flow control, example networks. Packet switching and forwarding: bridges, switches. Internetworking: Internet Protocol, routing, addressing, IPv6, multicasting, mobile IP. End-to-end protocols: UDP, TCP. Network security concepts. Application-level protocols. Laboratory: two hours per week.

COMP 6521 Advanced Database Technology and Applications (4 credits)
Prerequisite: COMP 5531.
Review of standard relational databases, query languages. Query processing and optimization. Parallel and distributed databases. Information integration. Data warehouse systems. Data mining and OLAP. Web databases and XML Active and logical databases, spatial and multimedia data management. Laboratory: Two hours per week.

COMP 6531 Foundations of the Semantic Web (4 credits)
Web markup languages, World Wide Web Consortium (W3C) standards, Extensible Markup Language (XML) Resource Description Framework (RDF), schema for markup languages, Semantic Web, ontology development, markup languages for ontologies, Web Ontology Language (OWL), logical foundations of ontologies, description logics, reasoning with ontologies. A project.

COMP 6591 Introduction to Knowledge-Base Systems (4 credits)
Prerequisite: COMP 5531.
Review of first-order logic, relational algebra, and relational calculus. Fundamentals of logic programming. Logic for knowledge representation. Architecture of a knowledge-base system. Fundamentals of deductive databases. Top-down and bottom-up query processing. Some important query processing strategies and their comparison. Project or term paper on current research topics.

COMP 6621 Discrete Mathematics of Paul Erdös (4 credits)
Introduction to the methods and proof techniques of Paul Erdös that are particularly applicable to Computer Science. Proof of Bertrand's postulate. The Erdös-Szekeres and the de Bruijn-Erdös theorems. Ramsey's theorem and Ramsey numbers. Van der Waerden's theorem and Van der Waerden numbers. Delta-systems and a proof of the Erdös-Lovász conjecture. The Erdös-Ko-Rado theorem. Extremal graph theory. Random graphs and graph colouring. The probabilistic method and its applications in theoretical Computer Science. A project.

COMP 6641 Theory of Computation (4 credits)
Prerequisites: COMP 5361, COMP 5511.
General properties of algorithmic computations. Turing machines, universal Turing machines. Turing computable functions as a standard family of algorithms. Primitive recursive functions. Church's thesis, recursive sets. Recursively enumerable sets and their properties. Rice's theorem. Time and space complexity measures. Hierarchy of complexity measures. Advanced topics in complexity theory. A project.

COMP 6651 Algorithm Design Techniques (4 credits)
Prerequisites: COMP 5361, COMP 5511.
Mathematical preliminaries; Empirical and theoretical measures of algorithm efficiencies; Optimization and combinatorial techniques and algorithms including greedy algorithms, dynamic programming, branch-and-bound techniques and graph network algorithms; Amortized complexity analysis; String matching algorithms; NP-complete problems and approximate solutions; Probabilistic algorithms. A project.

COMP 6661 Combinatorial Algorithms (4 credits)
Prerequisites: COMP 5361, COMP 5511.
Representation and generation of combinatorial objects; search techniques; counting and estimation. Projects on selected applications from combinatorics and graph theory.

COMP 6711 Computational Geometry (4 credits)
Prerequisite: COMP 5511 or equivalent.
Efficient algorithms and data structures to solve geometric problems. Problems discussed include convex hulls, line intersections, polygon triangulation, point location, range searching, Voronoi diagrams, Delaunay triangulations, interval trees and segment trees, arrangements, robot motion planning, binary space partitions, quadtrees, and visitility. Algorithmic methods include plane sweep, incremental insertion, randomization, divide and conquer. Emphasis will be given to computation and complexity, with applications in computer graphics, computer aided design, geographic information systems, networks, mesh generation, databases, and robot motion planning. A project.

COMP 6721 Artificial Intelligence (*) (4 credits)
Prerequisite: COMP 5511 or equivalent .
Scope of AI. First order logic. Automated reasoning. Search and heuristic search. Game-playing. Planning. Knowledge representation. Probabilistic reasoning. Introduction to machine learning. Introduction to natural language processing. A project.

COMP 6731 Pattern Recognition (*) (4 credits)
Prerequisite: COMP 5511.
Preprocessing. Feature extraction and selection. Similarity between patterns and distance measurements. Syntactic and statistical approaches. Clustering analysis. Bayesian decision theory and discriminant functions. Clustering and classification techniques. Applications. A project. Laboratory: two hours per week.

COMP 6741 Intelligent Systems (*) (4 credits)
Prerequisite: COMP 5511.
Knowledge representation and reasoning. Uncertainty and conflict resolution. Design of intelligent systems. Grammar-based, rule-based, and blackboard architectures. A project. Laboratory: two hours per week.

COMP 6751 Natural Language Analysis (4 credits)
Introduction to natural language processing. Structure of English. Grammars and parsing. Lexical and compositional semantics. Pragmatic issues. Applications in text mining and information extraction. A project.
Note: Students who have received credit for COMP 7741 before September 2011 may not take this course for credit.

COMP 6761 Advanced 3D Graphics for Game Programming (4 credits)
Prerequisite: COMP 5511.
Fundamental algorithms, techniques, and software engineering principles for 3D graphics. Introduction to real-time graphics application architecture; review of basic 3D concepts of modeling, viewing, and rendering. 3D graphics functions, pipeline, and performance. Hierarchical 3D graphics. Algorithms for

occlusion culling, collision detection, photorealism, shadows, and textures. Current trends and state-of-the-art graphics and physics algorithms. Laboratory: Two hours per week.

COMP 6771 Image Processing (*) (4 credits)
Prerequisite: COMP 5511.
Digital image fundamentals; image enhancement: histogram processing, filtering in the spatial domain, filtering in the frequency domain; image restoration and reconstruction; image segmentation: line detection, Hough transform, edge detection and linking, thresholding, region splitting and merging; image compression; introduction to wavelet transform and multi-resolution processing. A project. Laboratory: two hours per week.

COMP 6781 Statistical Natural Language Processing (4 credits)
The course covers robust methods to natural language processing (NLP) and their applications to manipulate large text collections. Topics covered in this course include: Zipf's law, information retrieval, statistical machine translation, N-gram language models and smoothing techniques, word sense disambiguation, part-of-speech tagging and probabilistic grammars and parsing. A project.

COMP 6791 Information Retrieval and Web Search (*) (4 credits)
Prerequisite: COMP 5511.
Basics of information retrieval (IR): Boolean, vector space and probabilistic models. Tokenization and creation of inverted files. Weighting schemes. Evaluation of IR systems: precision, recall, E-measure. Relevance feedback and query expansion. Application of IR to Web search engines: XML, link analysis, PageRank algorithm. Text categorization and clustering techniques as used in spam filtering. A project. Laboratory: two hours per week.

COMP 6811 Bioinformatics Algorithms (4 credits)
Prerequisite: COMP 5511.
The principal objectives of the course are to cover the major algorithms used in bioinformatics; sequence alignment, multiple sequence alignment, phylogeny; classifying patterns in sequences; secondary structure prediction; 3D structure prediction; analysis of gene expression data. This includes dynamic programming, machine learning, simulated annealing, and clustering algorithms. Algorithmic principles will be emphasized. A project.

COMP 6821 Bioinformatics Databases and Systems (4 credits)
Prerequisite: COMP 5531.
The principal objectives of the course are to survey the needs of bioinformatics for data management, knowledge management, and computational support; to provide in-depth description of an example of each kind of database and system; and to introduce advanced database technology and software technology relevant to the needs of bioinformatics. A project.

COMP 691 Topics in Computer Science I (4 credits)
Subject matter will vary from term to term and from year to year. Students may re-register for this course, providing that course content has changed. Changes in content will be indicated by the letter following the course number, e.g., COMP 691A, COMP 691B, etc.

COMP 6961 Graduate Seminar in Computer Science (1 credit)
Students will have to attend a selected set of departmental seminars and submit a comprehensive report on the topics presented in one of the seminars. This course is graded on a pass/fail basis.

COMP 7241 Parallel Algorithms and Architectures (4 credits)
Prerequisite: COMP 6281 or permission of instructor.
Parallel architectures; memory organization, interconnection structures, data routing techniques. Parallel algorithms; paradigms and design techniques, complexity analysis, algorithms for various computation models. A project.

COMP 7251 Mobile Computing and Wireless Networks (4 credits)
Prerequisite: COMP 6461.
Introduction to mobile computing and wireless networks:local (LAN), personal (PAN) and metropolitan (MAN). Mobile ad hoc networks and sensor networks. Algorithms and protocols for medium access, routing, topology control, and reliable transport. A project.

COMP 7451 Semantics of Programming Languages (4 credits)
Prerequisite: COMP 6411.
The need for semantic descriptions of programming languages. Classification of semantics: operational, axiomatic, model-theoretic, algebraic, denotational. Classification of languages: procedural, functional, logic, equational. Applications: verification, construction, language design, temporal logic for distributed systems, semantics for advanced languages.

COMP 7521 Cryptography and Data Security (4 credits)
Prerequisites: COMP 5531, COMP 6651.
Traditional cryptography. Information theory. Private-key (symmetric-key) and public-key (asymmetric-key) cryptographic algorithms. Advanced Encryption Standard (Rijndael). Cryptographic hash functions. Digital signatures. Data-origin authentication and data integrity. Entity authentication. Key distribution, management, recovery, and exhaustion. Authentication protocols. Security services (confidentiality, authentication, integrity, access control, non-repudiation, and availability) and mechanisms (encryption, data-integrity mechanisms, digital signatures, keyed hashes, access-control mechanisms, challenge-response authentication, traffic padding, and routing control). Projects will be offered in selected topics in cryptography.

COMP 7531 Database Systems Principles (4 credits)
Prerequisite: COMP 6521.
Database models. Algebraic, logical, and deductive database languages. Query equivalence and optimization. Query rewriting, information integration and data exchange. Incomplete information and complex values. Introduction to current research topics. A project.

COMP 7651 Advanced Analysis of Algorithms (4 credits)
Prerequisite: COMP 6651.
Amortized analysis of algorithms, NP-hardness and approximation algorithms, online algorithms, randomized algorithms. Selected topics of current interest. Project or term paper.

COMP 7661 Advanced Rendering and Animation (4 credits)
Prerequisite: COMP 6761.
Advanced concepts in rendering and animation with emphasis on computational techniques for synthesizing complex realistic images, both static and dynamic. Topics include: overview of computer graphics techniques in games, cinema, and engineering; realistic rendering methods in real time; animation techniques including physics-based animation. A project.

COMP 7751 Advanced Pattern Recognition (4 credits)
Prerequisite: COMP 6731.
Pattern recognition principles; modern methods in digitization and data acquisition; advanced topics in feature extraction and selection; principal component analysis and clustering techniques; multiple classifiers and expert systems; advanced topics in neural networks in pattern recognition, performance evaluation and error reduction. Applications. A project.

COMP 7781 Advanced Image Processing (4 credits)
Prerequisite: COMP 6771 or permission of instructor.
Digital image processing; segmentation morphological processing; wavelet transforms and multi-resolution analysis; partial differential equation approach; variational methods; diffusion and shock filters; Markov random field and Bayesian inference; energy minimization framework: snakes, active contours, Mumford-Shah model, level set method; numerical implementation; applications; image inpainting; registration; and document processing. A project.

COMP 791 Topics in Computer Science II (4 credits)
Subject matter will vary from term to term and from year to year. Students may re-register for this course, providing that course content has changed. Changes in content will be indicated by the letter following the course number, e.g. COMP 791A, COMP 791B, etc.

COMP 7941 Master's Research and Thesis (29 credits)
Students are required to submit a thesis prepared under the guidance of a faculty member appointed by the Faculty Graduate Studies Committee. The thesis must represent the result of the student's independent work undertaken after admission to the program. The thesis will be evaluated by a committee appointed by the Faculty Graduate Studies Committee.

COMP 8901 Doctoral Research and Thesis (70 credits)

SOEN 6011 Software Engineering Processes (4 credits)
Introduction to software engineering concepts. Software process models and associated activities. Including requirements analysis, specification, design, implementation, and validation. Software documentation. Inspections and reviews. Collaborative works and project management. A project.

SOEN 6311 Formal Methods (*) (4 credits)
Prerequisites: COMP 5541 or SOEN 6011 or equivalent.
Components of formal systems: formal methods; levels of formalism. Integrating formal methods into the existing software life-cycle process model for a given project. Attributes of a formal specification language. Formal notations based on extended finite-state machines; case studies involving the design of user interfaces, reactive systems, and concurrent systems. Software development using formal methods, including tools for: type checking; debugging; verifying checkable properties; validation of refinements; and code generation from refinements. A project.

SOEN 6431 Software Comprehension and Maintenance (4 credits)
The course addresses both technical and managerial views of software comprehension and software maintenance issues. Topics covered in this course include: cognitive models, software visualization, CASE tools, reverse engineering, static and dynamic source code analysis, software configuration management, and introduction to current research topics in software maintenance and program comprehension. A project.
Note: Students who have received credit for COMP 6431 may not take this course for credit.

SOEN 6441 Advanced Programming Practices (4 credits)
Problems of writing and managing code. Managing code complexity and quality through a programming process. Coding conventions. Inline software documentation. Software configuration management. Tools and techniques for testing software. Multithreading concurrency. Code reuse in software development. Quality in coding, fault tolerance. A project. Laboratory: two hours per week.

SOEN 6461 Software Design Methodologies (4 credits)
Prerequisite: COMP 5541.
Introduction to software design processes and their models. Representations of design/architecture. Software architectures and design plans. Design methods, object-oriented application frameworks, design

patterns, design quality and assurance, coupling and cohesion measurements, design verification and documentation. A design project.
Note: Students who have received credit for COMP 6471 before September 2011 may not take this course for credit.

SOEN 6471 Advanced Software Architectures (4 credits)
Prerequisite: COMP 5541 or equivalent.
Study of architectural view models, architectural styles and frameworks; Architectural Description Languages (ADLs) and Architectural Specification Languages (ASLs); Architectural design patterns; advanced topics such as Model Driven Architecture (MDA), Service Oriented Architecture (SOA), extensible frameworks (like the OSGi specification and framework), Software Product Line Engineering (SPLE), and architectures in support of cloud computing. A project.
Note: Students who have received credit for COMP 6471 may not take this course for credit.

SOEN 6481 Software Systems Requirements Specification (4 credits)
The requirements engineering (RE) process. Requirements engineering in different software lifecycle models. Problem analysis. Requirements elicitation. Requirements evaluation. Inconsistency management. Risk analysis. Requirements prioritization and negotiation. Requirements specification: natural language documentation, IEEE and ISO standards. Use cases. Agile processes and user stories. Introduction to formal specification: logics, formal languages. Requirements quality assurance. RE tools. Requirements evolution. Traceability. Domain modeling: UML, ontologies, domain-specific languages. Modeling behaviour. Acceptance criteria. Test cases. Cost models. A project.
Note: Students who have received credit for COMP 6481 may not take this course for credit.

SOEN 6611 Software Measurement (4 credits)
Prerequisite: SOEN 6011.
Role of measurement in Software Engineering, theoretical, technical and managerial views on software measurement. Representational theory of measurement. Theoretical validation of software measurement. Measurement program: goal-driven approach. Collecting and analyzing software engineering data. Software quality modeling and measuring. Testing and measurement. Reliability models. Functional size measurement methods. Effort estimation models and their usage in project management. Software measurement standards. Tool support. A project.

SOEN 6751 Human Computer Interface Design (4 credits)
Prerequisite: COMP 5541.
Introduction to human computer interaction. User-centered design process. User modeling. Task analysis. User interface design knowledge (principles, guidelines and patterns). User interface prototyping and a team implementation project. User interface evaluation. Laboratory: two hours per week.

Note: Note: Students who have received credit for COMP 6751 before September 2011 may not take this course for credit.

SOEN 6761 Multimedia Computing (4 credits)
Prerequisite: SOEN 6011 previously or concurrently.
This course covers the state-of-the-art technology for multimedia computing. The course topics will cover current media types, images, video, audio, graphics and 3D models in terms of algorithms and data structures for their capture, representation, creation, storage, archival, transmission, assembling, presentation and retrieval. This course will cover fundamental ideas in multimedia technology applicable to computer science and software engineering. A project.

SOEN 6841 Software Project Management (4 credits)
Prerequisite: COMP 5541 or equivalent.
Fundamental concepts of management activities, demonstrating how it can relate to software engineering and how the two can be mutually supportive throughout software development and maintenance. Overview of object-oriented development; software development processes; quality considerations; activity planning; risk management; monitoring and control; maintenance and evolution; issues of professional ethics and practice, and legal issues. A project.

SOEN 6861 Services Computing: Foundations, Design and Implementations (4 credits)
System design with Service Oriented Architecture. Open standards for Web services. Development of SOAP (Service-Oriented Architecture and Programming) and RESTful (REpresentational State Transfer) services. Business process modeling and management. Service composition. Formal models for services. A project.
Note: Students who have received credit for SOEN 691A (Services Computing: Foundations, Design and Implementations) may not take this course for credit.

SOEN 691 Topics in Software Engineering (4 credits)
Subject matter will vary from term to term and from year to year. Students may re-register for this course, providing that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g. SOEN 691A, SOEN 691B, etc.

SOEN 6951 Software Engineering Case Study (4 credits)
Students will complete a case study of a software project. Whenever possible, the project should be conducted in an industrial environment with the cooperation of the student's employer.
Note: Students who have received credit for COMP 6951 may not take this course for credit.

SOEN 7481 Software Verification and Testing (4 credits)
Prerequisites: SOEN 6461, SOEN 6481.
Overview of current software engineering testing methods, techniques and standards for testing system

implementations. Classical white-box testing; dataflow testing; classical black-box testing; integration testing; system testing. Testing measures; test plan. IEEE standard. Object-oriented testing. Test-driven development. Testing quality measures. Test reduction techniques. Techniques for test automation. Tools and techniques for formal verification of software system designs: model checking and theorem proving. A project.
Note: Students who have received credit for COMP 7481 may not take this course for credit.

SOEN 7761 Intelligent User Interfaces (4 credits)
Prerequisite: SOEN 6751.
Intelligent systems and intelligent interfaces. A brief introduction to knowledge representation and reasoning. Creation and adaptation of user models. Software agents at the user interface. Applications of these concepts in the development of intelligent user interfaces. Adaptive user interfaces. Selected advanced topics, such as natural language interfaces, speech based user interfaces, and mobile user interfaces. Laboratory: two hours per week. A project.
Note: Students who have received credit for COMP 7761 before September 2011 may not take this course for credit.

SOEN 791 Topics in Software Engineering II (4 credits)
Subject matter will vary from term to term and from year to year. Students may re-register for this course, providing that the course content has changed. Changes in content will be indicated by the letter following the course number, e.g. SOEN 791A, SOEN 791B, etc.

SOEN 7941 Master's Research and Thesis (29 credits)
Students are required to submit a thesis prepared under the guidance of a faculty member appointed by the Faculty Graduate Studies Committee. The thesis must represent the result of the student's independent work undertaken after admission to the program. The thesis will be evaluated by a committee appointed by the Faculty Graduate Studies Committee.

SOEN 8901 Doctoral Research and Thesis (70 credits)

Diploma in Computer Science

The Department of Computer Science and Software Engineering offers a Diploma program for qualified university graduates from diverse backgrounds who wish to obtain expertise in computer science fundamentals. Graduates of the Diploma program will obtain qualifications similar to those of graduates of the Bachelor of/Baccalaureate in Computer Science program. Upon completion of the Diploma, those with superior academic records who wish to pursue their studies may apply for admission to a 45 credit Master's program in Computer Science.

Admission Requirements. To be considered for admission, applicants must hold a Bachelor's degree with above-average standing, and must have completed COMP 5481 Programming and Problem Solving or equivalent courses in C++ prior to entry into the Diploma program. Equivalence will be determined by the Diploma Program Director. Applicants deficient in mathematics or English are required to make up their deficiencies before they can be considered for admission. The Faculty reserves the right to set a quota on the number of admissions to the program.

Application Deadlines

Applications for admission from within Canada must be complete by May 1 for the Fall term. Applications from outside Canada must be complete by February 15 for the Fall term. There is no admission to this program in the Winter or the Summer term.

Requirements for the Diploma

- **Credits.** A fully-qualified candidate is required to complete a minimum of 31 credits.
- **Courses.** Candidates are required to take COMP 5201, 5361, 5421, 5511, 5461, 5531, 5541, and ENCS 6721.
- **Performance.** Students who have completed at least four courses will be assessed in June of each year. The assessment will be based on creditable courses completed after the first registration in the program. To be permitted to continue, students must have obtained a cumulative grade point average (CGPA) of at least 2.70.
- **Time Limit.** All work for a diploma program must be completed within 6 terms (2 years) from the time of initial registration in the program for full-time students; for part-time students the time limit is 12 terms (4 years).
- **Graduation.** To be eligible to graduate, students must have completed course requirements with a CGPA of at least 2.70.

Courses

COMP 5201 Computer Organization and Assembly Language (4 credits)
Programming in a subset of a suitably chosen assembly language; instruction-set level view of computers; translation of sample high-level language constructs to the instruction-set level. User-level view of the computer system through an operating system. Privileged modes of operation of the hardware for achieving goals such as protection and resource management; the hierarchy of the memory system as a resource, its concepts and requirements. Input/output including interrupt handling.

COMP 5261 Computer Architecture (3 credits)
Prerequisite: COMP 5461 previously or concurrently.

Computer architecture models: control-flow and data-flow. Concurrency and locality, data dependency theory. Instruction level parallelism. Instruction scheduling. Pipelined processors. Vector processors. Thread level parallelism. Multiprocessors. Shared memory models. Coherence protocols. Interconnection networks. Performance issues. Advanced topics in contemporary computer architectures. Case studies.

COMP 5361 Discrete Structures and Formal Languages (4 credits)
Discrete mathematics: sets, logic, quantifiers, relations, and functions. Regular languages: finite automata (deterministic and non-deterministic), regular expressions, regular grammars, pumping lemmas for regular languages, closure properties for regular languages. Context-free languages: context-free grammars, parsing and ambiguity, normal forms for grammars, pushdown automata, closure properties for context free languages.

COMP 5421 Advanced Programming (4 credits)
Prerequisite: COMP 5511.
Designing classes and programs. Program development. Encapsulation; dependency minimization. Inheritance hierarchies; abstract classes and interfaces; frameworks, Reading and writing files; serialization. Applications of inheritance and generics. Design and use of class libraries; user interface design; database and network programming.

COMP 5461 Operating Systems (4 credits)
Prerequisites: COMP 5201, 5511.
Basic concepts of operating systems and system programming. Processes, interprocess communication, and synchronization, memory allocation, segmentation, paging. Resource allocation, scheduling, performance evaluation. File systems, storage devices, I/O systems. Protection, security, and privacy. Advanced operating system concepts: distributed systems, multi-processor and parallel systems, real-time systems.

COMP 5481 Programming and Problem Solving (4 credits)
Prerequisites: MATH 204, 205 or equivalent.
Overview of programming and problem solving. Operators and expressions. Types, values, and variables; type conversion. Classes, objects, and methods. Assignment, conditional and repetitive statements. Arrays. Input and Output. Program structure and organization; encapsulation. Recursion and its uses. Designing classes and member functions; aggregation and inheritance. Introduction to libraries and their applications. Lectures: three hours per week. Tutorial: one hour per week. Lab: 3 hours per week.

COMP 5511 Principles of Data Structures (4 credits)
Prerequisite: COMP 5481 or equivalent training or experience in Java programming.
Definition, use, and application of fundamental data structures and associated algorithms. Asymptotic analysis of algorithms. Storage management: arrays, strings, lists and trees. Data abstraction: stacks,

queues, priority queues, sets, and tables. Searching and sorting. Programming techniques: designing classes for data structures.

COMP 5531 Files and Databases (4 credits)
Prerequisites: COMP 5361, 5511.
Introduction to file management: basic file structures and access methods, sequential and indexed-sequential files, B+-trees and R-trees; external sorting; dynamic hashing; clustering techniques. Introduction to database management: fundamental data models - hierarchical, network, and relational; data dependencies; normal forms; and relational database design. Formal query languages: relational algebra, calculus; commercial languages: SQL, QBE. Fundamentals of data processing.

COMP 5541 Tools and Techniques for Software Engineering (4 credits)
Prerequisites: COMP 5361, COMP 5511, ENCS 6721; or permission of the Graduate Program Director.
The software life cycle. IEEE and MIL standards for software documentation. Formal methods. Software architectures. Software design and prototyping. Interfacing and encapsulation. Use of libraries, frameworks, and CASE tools. Implementation and maintenance. Verification and validation.

COMP 5611 Elementary Numerical Methods (3 credits)
Prerequisites: COMP 5361; COMP 5511.
Error analysis and computer arithmetic. Numerical methods for solving linear systems, Gaussian elimination, LU decomposition. Numerical solution of non-linear equations, fixed point iterations, rate of convergence. Interpolations and approximations, Lagrange polynomials, divided differences, discrete least-square approximation, Legendre polynomials. Numerical integration, Newton-Cotes formulas, Romberg integration. Emphasis will be on the development of efficient algorithms.

Art Education

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Art Education Website

Doctor of/Doctorate in Philosophy (Art Education)
Master of/Magisteriate in Arts (Art Education)

Doctor of/Doctorate in Philosophy (Art Education)

Admission Requirements. The normal requirement for admission is a Master of Arts degree in art education, with superior standing, from a recognized university. A candidate possessing a Master of Fine Arts degree must also complete the art education readings and research methods courses of the Master of/Magisteriate in Arts in Art Education. Applicants must have teaching experience, certification, or related professional experience. This program is recognized by the Quebec Ministry of Education for purposes of *perfectionnement*.

Requirements for the Degree

- **Credits.** A fully qualified applicant entering the program with a master's degree is required to complete a minimum of 90 credits.
- **Residence.** The minimum residence requirement for the degree is two years of full-time study or the equivalent in part-time study. One of these residence years may be taken on a part-time basis. The year of full-time study may be the year of writing a dissertation.
- **Program Advisors and Thesis Supervisors.** Upon admission to the program, each student is assigned to a graduate faculty member, who serves as Program Advisor until the student passes the Comprehensive Examination. After completing the Comprehensive Exam, the student selects a Thesis Supervisor from the available Graduate Program Faculty.
- **Required Courses.** The program includes 27 credits of course work. Twelve credits in required courses, ARTE 870, 872, 882, and 884, focus on historical, theoretical and methodological aspects of teaching and research in art education. Students select a further 15 credits of course work and independent study in art education and/or relevant disciplines, to complement their research and professional interests. These courses must be approved by the student's program advisor and the Graduate Program Director.
- **ARTE 883 Comprehensive Examination (no credit).** Upon completion of a minimum of 21 course credits, each student must pass a comprehensive examination composed of written and oral

components. The examination assesses the student's competence in the field of Art Education. The student must pass this exam in order to continue in the program. *A Student Guide to the Comprehensive Examination* gives detailed information on the exam and is available from the department's graduate programs office. Generally, one examination time is established each year, usually at the end of the winter term.

- **Research and Thesis.** The program includes 63 credits for research and the thesis. A doctoral thesis is expected to make an original contribution to knowledge in the field of art education, and to be written in acceptable scholarly form. For details on thesis procedures and format, see the relevant sections of this calendar and the Thesis Preparation and Thesis Examination Regulations available from the School of Graduate Studies. In addition, *Art Education Procedures for Doctoral Theses* is available in the department's graduate programs office.
- **Admission to Candidacy.** Upon approval of the thesis proposal by the Thesis Advisory Committee, the student is officially admitted to candidacy for the degree.

Academic Requirements

- **Academic Standing.** Students are expected to earn a grade of *B* or higher in each course in the program. Students should consult the written explanation of the department's rule regarding acceptable academic performance, available in the department's graduate programs office.
- **C Rule.** Students who receive more than one *C* grade during the course of their PhD studies will be required to withdraw from the program. Students may apply for re-admission. Students who receive another *C* after re-admission will be required to withdraw from the program and will not be considered for re-admission.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

Elective course offerings change from year to year in light of the interests of students and faculty. In any session only those courses will be given for which there is sufficient demand.

ARTE 806 Inquiry Through Art Production (3 credits)
In this course students identify the content and the processes essential to their on-going studio performance. Students are expected to develop parallel inquiry into exhibitions, installations, performances,

documentations, notation systems and related readings. Evaluation is based on workshop and seminar participation, studio performance and class presentations. Computer access and shared studio space are available. This course may be repeated as ARTE 807.

ARTE 850 Selected Topics in Art Education (3 credits)
A seminar course offering students the opportunity to study various aspects of art education. Specific topics vary from year to year to take advantage of the special expertise of the faculty.

ARTE 867 Directed Studies in Art Education I (3 credits)
Independent study in the area of concentration.

ARTE 868 Directed Studies in Art Education II (3 credits)
Independent study in the area of concentration.

ARTE 870 Critical Perspectives on Art Education: History, Theory and Practice (3 credits)
A seminar course in which students develop critical reading and writing skills while adding to their understanding of developments past and present that have shaped the field of art education.

ARTE 872 Advanced Critical Analysis (3 credits)
Prerequisite: ARTE 870.
A seminar course in which students develop advanced skills in critical analysis, academic writing and library research. Assignments include compiling and writing a review of literature related to thesis research. Students develop questions related to their area of research and professional interest to be used on their PhD comprehensive examination.

ARTE 882 Research Practice (3 credits)
A seminar course in which students conduct a small scale research project based on their own research proposal.

ARTE 883 Comprehensive Examination (no credit)
Each student must successfully complete the doctoral comprehensive examination in order to be admitted to candidacy. The comprehensive examination is composed of written and oral components.

ARTE 884 Doctoral Seminar (3 credits)
This course addresses research and communication, thesis writing, and professional practice.

ARTE 890 Research and Thesis (63 credits)
Includes thesis proposal and its approval by the Thesis Advisory Committee, Research (including any further study that may be required to gain needed expertise), written thesis and oral examination. Students are encouraged to periodically present their research-in-progress to academic and professional audiences.

The following courses are cross-listed at the MA and PhD levels:

MA	PhD
ARTE 606	ARTE 806
ARTE 660	ARTE 850
ARTE 670	ARTE 870
ARTE 672	ARTE 872
ARTE 682	ARTE 882

Master of/Magisteriate in Arts (Art Education)

Admission Requirements. A Bachelor of Fine Arts or a Bachelor of Arts with specialization in art education or its equivalent is required. An overall grade average of *B* or better is expected. In addition, the applicant is expected to have had experience in the teaching of art or art-related subjects.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study.
- **Program Advisors and Thesis Supervisors.** Upon admission to the program, each student is assigned to a graduate faculty member, who serves as Program Advisor. Each student in the Thesis Option selects a Thesis Supervisor and Thesis Advisor Committee from the available Graduate Program Faculty.
- **Programs of Study.**

  Option A

  The MA (Art Education) Thesis Option is suitable for students seeking to develop in-depth research expertise, and whose goals include doctoral studies and/or research-oriented professional positions.

  - 12 credits in core Art Education courses: ARTE 670, 672, 680 and 682.
  - 3 credits in Art Education Special Topics courses: ARTE 660 A-Z.
  - 6 credits in elective courses, including additional ARTE 660A-Z Special Topics courses and Topics in Studio Inquiry courses ARTE 606, 607, 608, 609.
  - 24 credits Thesis: ARTE 698. Students may choose from three types of thesis: Scholarly Thesis, Studio-based Thesis, or Teaching-based Thesis. All of these require approval of a

thesis proposal and of the finished research project by the Thesis Supervisor and Thesis Advisory Committee, and an oral defense.

Option B

The MA (Art Education) Courses Option is suitable for students who seek advanced levels of professional development rather than in-depth training as researchers.

- 12 credits in core Art Education courses: ARTE 670, 672, 680 and 682.
- 12 credits in Art Education Special Topics courses: ARTE 660 A-Z
- 6 credits in Art Education Topics in Studio Inquiry courses: ARTE 606, 607, 608, 609, 610, 611.
- 15 credits in elective courses.* May include up to 12 additional credits in Topics in Studio Inquiry courses: ARTE 606, 607, 608, 609,610, 611.

* Elective Courses must be selected in consultation with the Program Advisor and approved by the Graduate Program Director. Some restrictions apply; for more details consult the department.

Academic Regulations

- **Academic Standing.** Students are expected to complete all courses credited toward the master's degree with a grade of *B* or higher. Under certain conditions one *C* grade may be permitted. Students should consult the written explanation of the department's rule regarding acceptable academic performance, available in the department's graduate office.
- **C Rule.** Students in research master's/magisteriate programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

Each year required courses and certain electives are offered. Course descriptions and schedules are available in the department's graduate programs office.

ARTE 606 Topics in Studio Inquiry (3 credits)
In this course students identify the content and the processes essential to their on-going studio performance. Students are expected to develop parallel inquiry into exhibitions, installations, performances, documentations, notation systems and related readings. Evaluation is based on workshop and seminar participation, studio performance and class presentations. Computer access and shared studio space are available. This course may be repeated as ARTE 607, 608, 609, 610, 611.

ARTE 660 Selected Topics in Art Education (3 credits)
A seminar course offering students the opportunity to study various aspects of art education. Specific topics vary from year to year to take advantage of the special expertise of the faculty.

ARTE 670 Critical Perspectives on Art Education History: History, Theory and Practice (3 credits)
A seminar course in which students develop critical reading and writing skills while adding to their understanding of developments past and present that have shaped the field of art education.

ARTE 672 Advanced Critical Analysis (3 credits)
Prerequisite: ARTE 670.
A seminar course in which students develop advanced skills in critical analysis, academic writing and library research. Assignments include compiling and writing a review of literature on a topic of research or professional interest.

ARTE 680 Foundations for Inquiry (3 credits)
A seminar course in which students are introduced to the basic concepts, terminology, and contexts of inquiry in art education. Students learn about the practice of systematic inquiry, including: identifying and articulating a topic or question; situating the inquiry within a theoretical framework; relating the inquiry to art education practices; and selecting appropriate inquiry procedures. Each student develops a proposal for a small-scale project related to his/her particular art education interests.

ARTE 682 Research Practice (3 credits)
Prerequisite: ARTE 680.
A seminar course in which students conduct a small-scale research project based on their own research proposal. Students are introduced to appropriate forms and practices for conducting the project and presenting the results.

ARTE 698 Thesis
The thesis topic is chosen in consultation with the thesis supervisor, and is approved by the thesis advisory committee. Students produce a thesis proposal; conduct the proposed inquiry; produce the thesis; and present it orally to their thesis advisory committee. Guidelines for the thesis are described in Thesis

Preparation and Thesis Examination Regulations available from the School of Graduate Studies and Art Education's *Master of Arts Thesis Procedures* available from the department's programs office.

Scholarly Thesis (24 credits)
Students develop a research based scholarly thesis in consultation with the faculty supervisor. The thesis is a minimum of 20,000 words and must address a research question or problem through an empirical or philosophical investigation. The thesis must include a discussion that documents the student's reflections upon the methods and procedures employed, and the actual findings that resulted from an examination of the problem. The thesis culminates in a discussion of its implications for art education theory and/or practice. The thesis is presented to the advisory committee for evaluation, and for defence in an oral examination.

Studio-based Thesis (24 credits)
Students develop a cohesive body of artwork for presentation and a minimum 10,000 word written thesis component comprising a review of literature and other relevant resources, a theoretical and methodological contextualization, a critical reflection on the project and its outcomes, a linking of art making with art education and other areas of analysis as deemed necessary by the student and the student's advisory committee. The artwork and text, together comprising the thesis, are presented to the advisory committee. Evaluation includes an oral examination on both components.

Teaching-based Thesis (24 credits)
Students organize and conduct a professional teaching project, develop a teaching dossier, and write a thesis text directly related to art education, with the guidance of the faculty supervisor. The project may be carried out on site in an educational setting or institution. In the written component of the thesis (minimum10,000 words) students document, analyze and evaluate the project, presenting a literature review, a theoretical and methodological contextualization, and a critical reflection on the project and its outcomes. Evaluation includes an oral examination on this text, on the teaching portfolio, and on the outcomes of the project.

ARTE 664 Independent Study(3 credits)
ARTE 665 Independent Study (3 credits)

The following courses are cross-listed at the MA and PhD levels:

MA	**PhD**
ARTE 606	ARTE 806
ARTE 660	ARTE 850
ARTE 670	ARTE 870

ARTE 672 ARTE 872
ARTE 682 ARTE 882

Art History

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Art History Website

Doctor of/Doctorate in Philosophy (Art History)
Master of/Magisteriate in Arts (Art History)

Doctor of/Doctorate in Philosophy (Art History)

Admission Requirements. Those applying for either full-time or part-time admission must possess a Master of Arts degree or its equivalent in Art History. Applications must include a thesis research project accompanied by a letter of support from the proposed supervisor in the department. Prospective students should therefore contact individual professors, or the Graduate Program Director, to find the right supervisor for their doctoral research project.

Admission Criteria.

- Quality and pertinence of academic background.
- Feasibility of research in terms of material and faculty resources.
- Ability to understand English and French.

Language Requirements. Since this is a bilingual program, applicants must demonstrate a level of competence that would allow them to read and to follow lectures and discussions in both English and French. The ability to speak and write with facility in both languages is not required; students may participate in discussion, and may write reports, examinations and theses in English or French, as they choose.

Admission Procedures. The interuniversity admissions committee reviews all applications.

Requirements for the Degree

- **Credits.** A fully qualified candidate entering the program with a Master's/Magisteriate degree is required to complete 90 credits. These are apportioned as follows: courses and seminars, 12 credits; research tutorial, 6 credits; doctoral forum, 3 credits; comprehensive examinations, 9 credits; and thesis, 60 credits.

Typical progress for a full-time student in the program would consist of:

First Year: Block A seminar (6 credits), one seminar from Block B (3 credits), one elective seminar, approved by advisor (3 credits), research tutorial (6 credits).

Second Year: Comprehensive examinations (before fifth semester) (9 credits), doctoral forum (3 credits).

Third Year: Thesis (60 credits).

- **Residency.** The minimum required residency is three consecutive semesters.
- **Courses.** The courses offered through the inter-university program are open to all students, regardless of the university at which they are enrolled. All students must take the Block A seminar (Art History and its Methodologies), one Block B seminar selected from one of six thematic categories under the general heading Art History and its Object, and either another Block B seminar or a graduate seminar offered by one of the four universities and approved by the thesis supervisor.
- **Comprehensive Examinations (ARTH 808).** Before the fifth semester each full-time student must successfully complete one oral and two written examinations, which are evaluated by the three professors constituting the student's thesis committee. These examinations are based on a pre-established list of readings focused on the theoretical and methodological issues which inform the student's specific area of research. The exams are intended to verify whether the student is sufficiently prepared to undertake the writing of a thesis. Students who fail these examinations must take them a second time during the following semester. Those failing the second attempt will be withdrawn from the program.
- **Research Tutorial (ARTH 820).** This tutorial is directed by the thesis advisor and is oriented to the student's thesis topic. Its objective is to allow the student to articulate a detailed research project, define its corpus, and develop its theoretical and methodological hypotheses with a view to obtaining the approval of the thesis committee. This project, including an activity calendar, must be submitted at the end of the student's first year. Students should register once work is completed and a grade has been assigned.
- **Doctoral Forum (ARTH 807).** In the interests of promoting the development of an intellectual community within the program, a forum consisting of professors from the program and students engaged in their course work will be invited to present their ongoing research. The forum will be held once each semester during the academic year. Each student, at some point in his/her coursework, must give a paper based on his/her thesis research. This paper will be evaluated by a committee consisting of three professors and accorded a pass or fail grade.
- **Thesis (ARTH 830).** The doctoral candidate must submit a thesis which makes an important and original contribution to knowledge in Art History. The thesis is defended orally before a committee composed of five individuals: the thesis advisor, the two other members of the thesis committee,

one examiner from a department or program within the university other than the candidate's, and one external examiner from outside the four universities.

Academic Requirements

- **C Rule.** Students who receive more than one *C* grade during the course of their PhD studies will be required to withdraw from the program. Students may apply for re-admission. Students who receive another *C* after re-admission will be required to withdraw from the program and will not be considered for re-admission.
- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be required to withdraw from the program and will not be considered for re-admission.
- **Time Limit.** All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study or 24 terms (8 years) of part-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of 3.00.

Courses

Block A Seminar: ARTH 800 Art History and Its Methodologies (6 credits)

Block B Seminars: Art History and Its Object

B1: ARTH 801 Periods and Territories (3 credits)
B2: ARTH 802 Classification - Genres, Artistic Disciplines (3 credits)
B3: ARTH 803 Thematic Questions (3 credits)
B4: ARTH 804 Writings on Art (3 credits)
B5: ARTH 805 Critical Examination of Artistic Context (3 credits)
B6: ARTH 806 Formal and Semantic Studies (3 credits)

Master of/Magisteriate in Arts (Art History)

Admission Requirements. A Bachelor of Fine Arts or a Bachelor of Arts degree with a major in Art History or approved equivalent with at least a *B+* average in the major area is required. Applicants with deficiencies in their undergraduate preparation may be required to take a qualifying program prior to formal entry into the program. Qualified applicants lacking prerequisite courses may be required to take up to 12 undergraduate credits in addition to and as part of the regular graduate program.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.
- **Residency.** The minimum residency requirement is three terms of full-time study, or the equivalent in part-time study.
- **Language Requirement.** Reading knowledge of English and French is mandatory. Students are required to pass an examination in their second language, either French or English, prior to graduation.
- **Courses.** ARTH 655 is a required course for all students; this is a pass/fail course. A maximum of 3 credits may be selected from a discipline other than art history with the approval of the graduate program director. The graduate program director or the student's supervisor will assist the student in choosing seminars. Course scheduling is undertaken with the needs of both part-time and full-time students in mind.
- **Thesis.** Each student must submit a thesis (16000 to 20000 words) prepared under the supervision of a department thesis supervisor who will examine the thesis along with two other scholars.

Academic Regulations

- **C Rule.** Students who receive more than one *C* grade during the course of their MA studies will be withdrawn from the program. Students may apply for re-admission.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a Master's/Magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University although students are encouraged to complete the degree within 6 terms (2 years); for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

MA Courses

Each year the Department of Art History will offer a selection of courses from those listed below. A list of those courses, as well as information as to the specific content of seminar offerings, is available on the Department of Art History website

ARTH 610 Selected Issues in North American Art and Architectural History (3 credits)
An examination of selected issues in the production of or writing about the visual arts in North America.

ARTH 611 Industrialization and the Built Environment (3 credits)
An examination of selected aspects of the built environment when considered as more than a physical accumulation of structures.

ARTH 612 Contextualizing North American Sculpture: Topics in History, Theory and Practice (3 credits)
An examination of selected topics in the production of or writing about sculpture in North America.

ARTH 613 Special Topics in Amerindian and Inuit Art and Art History (3 credits)
Selected topics pertaining to the evolving arts practices of indigenous North American, considering such themes as collection and exhibition, commodity, continuity, and power relationships.

ARTH 614 Examining the Craft and Artisan Traditions in North America (3 credits)
Selected topics pertaining to the theory and practice of the so-called “craft” and “decorative” arts within a North American context.

ARTH 615 Issues in Postcolonial Theory in Art and Art History (3 credits)
Selected aspects of post-colonial and diasporic theory as they relate to North American art and art history.

ARTH 621 Collecting and Patronage in Canada (3 credits)
Investigations related to how and for whom Canadian art has been commissioned and collected.

ARTH 626 Nationhood and Identity in Canadian Art (3 credits)

ARTH 627 Feminism, Art, Art History (3 credits)
Aspects of feminism in relation to the production of art and writing about art in North America.

ARTH 633 Creative and Critical Literature in Art History (3 credits)
Aspects of the relationship between art and text, such as artists’ books, the impact of critical writing on art practice, etc.

ARTH 635 Topics in Canadian Painting (3 credits)
Selected topics pertaining to the practice of painting in Canada.

ARTH 636 Seminar in Canadian Architecture (3 credits)
Selected topics pertaining to the practice of architecture in Canada.

ARTH 638 Topics in Canadian Photography (3 credits)
Selected topics pertaining to the practice of photography in Canada.

ARTH 639 Issues in North American Architectural History (3 credits)
Selected issues pertaining to the production of or writing about architecture in North America.

ARTH 640 Issues in North American Photographic History (3 credits)
Selected issues pertaining to the production of or writing about photography in North America.

ARTH 641 Issues in Visual and Material Culture (3 credits)
Selected issues pertaining to the integration into art history of visual image/phenomena and material objects not traditionally considered to have fallen within definitions of the "fine arts".

ARTH 642 Aspects of Media and New Media (3 credits)
Aspects of the historical development, thematic content and conceptual strategies of practices involving media and "new technologies.

ARTH 643 Topics in Art and Globalization (3 credits)
An examination of selected topics pertaining to the manner in which art has negotiated and continues to negotiate globalization.

ARTH 647 Independent Studies in North American Art History (3 credits)

ARTH 648 Aspects of Museum and Curatorial Studies: Theory (3 credits)
Aspects of the theoretical underpinnings of museum and curatorial practices.

ARTH 649 Aspects of Curatorial Practice (3 credits)
The development and application of curatorial knowledge, skills and practices as fostered through the organization of an exhibition and related events.

ARTH 655 Thesis Seminar (Pass/Fail)

ARTH 656 Thesis (24 credits)

Creative Arts Therapies

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Creative Arts Therapies Website

Master of Arts/Magisteriate in Creative Arts Therapies (Art Therapy Option)
Master of Arts/Magisteriate in Creative Arts Therapies (Drama Therapy Option)
Master of/Magisteriate in Arts in Creative Arts Therapies (Music Therapy Option)
Graduate Certificate in Music Therapy Program

Master of Arts/Magisteriate in Creative Arts Therapies (Art Therapy Option)

Admission Requirements. Entry into the program requires a bachelor's/baccalaureate degree with courses in Visual Arts (24 credits, which must include 18 credits in Studio Arts, and 6 credits in Art History/Art Theory/Art Education, or approved equivalents); Psychology (24 credits, which must include courses in Introductory, Developmental and Abnormal Psychology, Theories of Personality, and Strategies of Inquiry, or approved equivalents); and An Introduction to Art Therapy (3 credits). Since enrolment is limited, applicants are selected on the basis of a past academic record of no less than a *B* average, a 500-word letter of intent and three letters of recommendation. Applicants must submit a portfolio of up to 20 slides, clearly identified in their name. They may choose to present pictures of their work in an 8.5" x 11" plastic pocket or submit digital pictures on CD. Previous work experience in a clinical, rehabilitative or educational setting is expected. Direct experience with the therapeutic process is highly desirable.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete 60 credits.
- **Residence.** The minimum residence requirement is two years (5 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** All students are required to take the following core courses (with a 3-credit value, unless otherwise specified): ATRP 600, ATRP 602, ATRP 603, ATRP 604, CATS 610, CATS 611, ATRP 613, ATRP 614, ATRP 620, ATRP 623, ATRP 624, ATRP 630, CATS 639 (1 credit), CATS 641 (1 credit), CATS 643 (1 credit), CATS 691, and ATRP 693. Six additional elective credits, to be chosen in consultation with an academic faculty advisor, are required of all candidates. With the approval of the Chair of Creative Arts Therapies and that of the cooperating department, some or all of the elective credits may be chosen from other graduate programs in the Faculty of Fine Arts, in other faculties at Concordia, or other universities.

Additionally, students choose to enter one of two streams of research in the program containing the following requirements:

Research Paper - CATS 689: Research Paper (9 credits)
OR
Applied Research Project - CATS 698: Applied Research Project with Report (6 credits) and **CATS 699:** Comprehensive Exam (3 credits).

- **Practicum.** In addition to the credit requirements, and as stipulated by the professional program approval associations (the American Art Therapy Association and the Canadian Art Therapy Association), each student must successfully complete a minimum of 800 hours (350 direct client contact hours and 450 agency hours) in the practice of art therapy, under faculty supervision, in an approved practicum setting. The program emphasizes experience with individual, group, and family formats for therapeutic interventions. Students work with different client populations during the first and second year of the practicum.
- **Research Paper - CATS 689.** The research paper represents the formal culmination of graduate studies in creative arts therapies. This paper includes a literature review and may also include methodology, specific procedures, research population or sample, data collection and analysis, as appropriate to the topic approved by the Creative Arts Therapies Research and Ethics Committee. Students develop their proposals for submission to this Committee as a course requirement for CATS 691. The required research courses (CATS 691 and ATRP 693) aim to provide students with knowledge of specific research methodologies.
- **Applied Research Project with Report and Comprehensive Exam - CATS 698 and CATS 699.** The student chooses this project to further explore specific pilot project reports, feasibility studies and research with artistic, photographic or video documentation relevant to the creative arts therapies. All applied projects must include a written component, and be presented by each student as a public seminar upon completion. An oral/written comprehensive case study examination must be taken to demonstrate integrative aspects of learning and knowledge in the study of art therapy.
- **Language Requirements.** While there are no formal language requirements, students intending to work in Quebec are strongly encouraged to develop a working knowledge of French.

Academic Regulations

- **Academic Standing.** Students are expected to complete all courses credited toward the master's/magisteriate degree with a grade of *B* or higher.
- **C Rule.** Under certain conditions, one *C* grade may be permitted. Students should consult the School of Graduate Studies' guidelines and policies regarding the minimum standards for Master's/Magisteriate Programs (see Academic Regulations section).

- **F Rule.** Students who receive a failing grade during the course of their studies will be withdrawn from the program but may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program; for part-time students, the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have obtained a cumulative GPA of at least 3.00.

Master of Arts/Magisteriate in Creative Arts Therapies (Drama Therapy Option)

Admission Requirements. Entry into the program requires a bachelor's/baccalaureate degree with courses in Theatre (24 credits or approved equivalents): Psychology (24 credits, which must include courses in Introductory, Developmental, and Abnormal Psychology, Theories of Personality, and a research methodology course to be approved by an academic faculty advisor, or approved equivalents); and An Introduction to Drama Therapy (3 credits). Since enrolment is limited, applicants are selected on the basis of a past academic record of no less than a *B* average, a 500-word letter of intent, and three letters of recommendation. Applicants must submit documentation, which may include video material of their involvement in drama and theatre. Previous work experience in a clinical, rehabilitative, or educational setting is expected. Direct experience with the therapeutic process is highly desirable.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete 60 credits.
- **Residence.** The minimum residence requirement is two years (5 terms) of full-time study, or the equivalent in part-time study.
- **Courses.** All students are required to take the following core courses (with a 3-credit value, unless otherwise specified): DTHY 600, DTHY 603, DTHY 604, CATS 610, CATS 611, DTHY 613, DTHY 614, DTHY 623, DTHY 624, CATS 639 (1 credit), CATS 641 (1 credit), CATS 643 (1 credit), DTHY 643, DTHY 644, DTHY 645, CATS 691, and DTHY 693. Six additional elective credits, to be chosen in consultation with an academic faculty advisor, are required of all candidates. With the approval of the Chair of Creative Arts Therapies and that of the cooperating department, some or all of the elective credits may be chosen from other graduate programs in the Faculty of Fine Arts, other faculties at Concordia University, or other universities.

  Additionally, students choose to enter one of two streams of research in the program containing the following requirements:

Research Paper - CATS 689: Research Paper (9 credits)
OR
Applied Research Project - CATS 698: Applied Research Project with Report (6 credits) and
CATS 699: Comprehensive Exam (3 credits).

- **Practicum.** In addition to the credit requirements, and as stipulated by the professional program approval of the National Association for Drama Therapy, each student must successfully complete a minimum of 800 hours (350 direct client contact hours and 450 agency hours) in the practice of drama therapy, under faculty supervision, in an approved practicum setting. The program emphasizes experience with individual, group, and family formats for therapeutic interventions. Students work with different client populations during the first and second year of the practicum.
- **Research Paper - CATS 689.** The research paper represents the formal culmination of graduate studies in the creative arts therapies. This paper includes a literature review and may also include methodology, specific procedures, research population or sample, data collection and analysis, as appropriate to the topic approved by the Creative Arts Therapies Research and Ethics Committee. Students develop their proposals for submission to this Committee as a course requirement for CATS 691. The required research courses (CATS 691 and DTHY 693) aim to provide students with knowledge of specific research methodologies.
- **Applied Research Project with Report and Comprehensive Exam - CATS 698 and CATS 699.** The student chooses this project to further explore specific pilot project reports, feasibility studies and research with performance, photographic or video documentation relevant to the creative arts therapies. All applied projects must include a written component, and be presented by each student as a public seminar upon completion. An oral/written comprehensive case study examination must be taken to demonstrate integrative aspects of learning and knowledge in the study of drama therapy.
- **Language Requirements.** While there are no formal language requirements, students intending to work in Quebec are strongly encouraged to develop a working knowledge of French.

Academic Regulations

- **Academic Standing.** Students are expected to complete all courses credited toward the Master's/Magisteriate degree with a grade of *B* or higher.
- **C Rule.** Under certain conditions, one *C* grade may be permitted. Students should consult the School of Graduate Studies' guidelines and policies regarding the minimum standards for Master's/Magisteriate Programs (see Academic Regulations section).
- **F Rule.** Students who receive a failing grade during the course of their studies will be withdrawn from the program, but may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.

- **Time Limit.** All work for a Master's/Magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program; for part-time students, the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have obtained a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts in Creative Arts Therapies (Music Therapy Option)

Admission Requirements. Entry into the program requires either: 1) a bachelor's/baccalaureate degree in Music Therapy with a 1,000-hour internship (or equivalent); OR 2) a Graduate Certificate in Music Therapy (or equivalent). Applicants are selected on the basis of a past academic record of no less than a B- average (3.00 on a 4.30 scale), or equivalent, a 500-word letter of intent, a curriculum vitae, and three letters of recommendation.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete 45 credits.
- **Residence.** The minimum required residency is three consecutive terms full-time study or the equivalent in part-time study.
- **Courses.** All students are required to take the following core courses (with a 3-credit value, unless otherwise specified): MTHY 600, MTHY 601, MTHY 602 (1.5 credits), MTHY 603 (1.5 credits), MTHY 623, MTHY 693, CATS 610, CATS 611, CATS 639 (1 credit), CATS 641 (1 credit), CATS 643 (1 credit), and CATS 691.

  Three additional elective credits, to be chosen in consultation with an academic faculty advisor, from: MTHY 624 and MTHY 625.

- **Thesis.** MTHY 699 (15 credits).
- **English Language Requirements.** Applicants whose first language is not English or French, and who are not Canadian citizens or permanent residents, must achieve a satisfactory performance in the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) before being considered for admission. The minimum required scores are: 80 for TOEFL iBT and 550 for TOEFL PBT. The IELTS requires a minimum Band score of 6.5. This requirement will be waived for foreign students who have completed their undergraduate degree at a university where English or French is the language of instruction.
- **French Language Requirements.**While there are no formal French proficiency requirements, students intending to work in Québec are strongly encouraged to develop a working knowledge of French.

Academic Regulations

Academic Standing. Students are expected to complete all courses credited towards the MA in Creative Arts Therapy, Music Therapy option with a grade of B- or higher (overall minimum GPA of 3.00 on a 4.30 scale).

C Rule. Under certain conditions, one C grade may be permitted. Students should consult the School of Graduate Studies' guidelines and policies regarding the minimum standards for Master's/Magisteriate Programs (see Academic Regulations section).

F Rule. Students who receive a failing grade during the course of their studies will be withdrawn from the program, but may apply in writing to the Program Director for readmission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.

Time Limit. It is expected that students will normally complete the proposed program within 3 terms (1 year) of full-time study from the time of initial registration in the program. In accordance with university policies, however, all work for the graduate program must be completed within 12 terms (4 years) from the time of initial registration in the program; for part-time students, the time limit is 15 terms (5 years).

Graduation Requirement. In order to graduate, students must have a minimum cumulative GPA of 3.00 on a 4.30 scale.

Graduate Certificate in Music Therapy Program

Admission Requirements. Entry into the program requires a bachelor's/baccalaureate degree with courses in Music (24 credits, which must include 6 credits in Musicology and 12 credits in Music Theory, or equivalents); Psychology (24 credits, which must include courses in Introductory, Developmental, and Abnormal Psychology, Theories of Personality, and Research Methodology, or equivalents); and Introduction to Music Therapy (3 credits), or equivalent. Applicants must show evidence of: primary instrument/voice performance abilities at the level of completion of a bachelor's degree in Music; piano performance abilities at Grade 6 Royal Conservatory of Music level, and fundamental guitar and voice skills. (Those invited for interview will provide a video recording of performances of two selections on each instrument). Since enrolment is limited, applicants are selected on the basis of a past academic record of no less than a *B*-average (3.00 on a 4.30 scale), or equivalent, a 500-word letter of intent, a curriculum vitae; and three letters of recommendation. Previous experience in a clinical, rehabilitative or educational setting is expected. Direct experience with the therapeutic process is highly desirable.

Proficiency in English. Applicants whose first language is not English or French, and who are not Canadian citizens or permanent residents, must achieve a satisfactory performance in the Test of English as a Foreign

Language (TOEFL) or the International English Language Testing System (IELTS) before being considered for admission. The minimum required score for the TOEFL iBT is 80 and 550 for TOEFL PBT. The IELTS requires a minimum Band score of 6.5. This requirement will be waived for foreign students who have completed their undergraduate degree at a university where English or French is the language of instruction. The Program reserves the right to require applicants to write tests of competence in English as a second language and to take any English courses deemed necessary as a result of such tests. These language proficiency courses will not be counted towards the Graduate Certificate in Music Therapy credit requirements.

Proficiency in French. While there are no formal French proficiency requirements, students intending to work in Québec are strongly encouraged to develop a working knowledge of French.

Requirements for the Certificate

Credits. A fully qualified candidate is required to complete 21 credits.

Courses. Candidates in the Graduate Certificate in Music Therapy program must take 21 credits of core courses (with a 3-credit value, unless otherwise specified): MTHY 501, MTHY 502 (1 credit), MTHY 503 (1 credit), MTHY 504 (1 credit), MTHY 510, MTHY 511, MTHY 512, MTHY 521 and CATS 611. As part of course requirements in MTHY 510, MTHY 511, and MTHY 512, each student must successfully complete a minimum of 1,200 hours in the practice of music therapy, under faculty supervision, in approved practicum settings. Practicum experiences include individual and group formats with children, adolescents and adults and with a minimum of three different client groups.

Academic Regulations

Academic Standing. Students are expected to complete all courses credited towards the Graduate Certificate in Music Therapy with a grade of *B* or higher.

C Rule. Under certain conditions, one *C* grade may be permitted. Students should consult with their Graduate Program Director.

F Rule. Students who receive a failing grade during the course of their studies will be withdrawn from the program, but may apply in writing to the Program Director for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.

Time Limit. It is expected that students will normally complete the graduate certificate program within 1 year. In accordance with university policies, however, all work for the certificate program must be completed within no longer than 6 terms (2 years) from the time of initial registration in the program and within no longer than 12 terms (4 years) for part-time students.

Graduation Requirement. In order to graduate, students must have a minimum cumulative GPA of 3.00.

Creative Arts Therapies Courses

CATS 609 Introduction to Dance/Movement Therapy (3 credits)
This course provides an introduction to the foundations and primary concepts of dance/movement therapy and explores their relevance and applications to other creative arts therapies modalities through experiential, somatic, and theoretical approaches.

CATS 610 Introduction to Topics in Clinical Psychology for Creative Arts Therapists (3 credits)
This seminar introduces creative arts therapists to the various psychopathologies, their symptomatologies, etiologies, current Diagnostic and Statistical Manual (DSM) diagnostic criteria, and treatments.
Note: Credit received for CATS 610 cannot be applied towards a graduate program in Psychology.

CATS 611 Counselling Skills for Creative Arts Therapists (3 credits)
This course introduces basic skills and practices of counselling and psychotherapy for creative arts therapists. It provides the opportunity to explore, develop, and practice the skills required for effective therapeutic interventions across varied theoretical orientations and treatment approaches. The course focuses on the therapeutic relationship and the therapeutic frame.

CATS 615 Independent Practicum in the Creative Arts Therapies (3 credits)
Prerequisites: ATRP 613, 614.
With the Department's approval and in agreement with a faculty supervisor, additional practicum experience is offered on an individual basis to students in special circumstances. A case study is required.

CATS 631A Selected Issues in the Creative Arts Therapies (3 credits)
This course may be repeated as CATS 631B, 631C, etc.

CATS 636 Independent Studies in Creative Arts Therapies (3 credits)
This course may be repeated as CATS 637.

CATS 638 Creative Process in Clinical Practice for Creative Arts Therapists (3 credits)
This course provides experiential learning in the clinical application of creative projection techniques through a methodology based on exploring character in myth and fairy tale. The creative process is examined through readings, discussions, masks, movement, music and drama.

CATS 639 Interdisciplinary Topics: Cross-cultural Competence in the Creative Arts Therapies (1 credit)
This course presents cross-cultural competence as an ethical obligation, providing an overview of multi-cultural counselling theory. Students explore challenges and opportunities arising in creative arts therapies clinical practice within an environment of cultural diversity as it relates to both the therapist and the client.

CATS 640 Studio Media and Practice for Creative Arts Therapists (3 credits)
Students develop skills with a variety of studio media and processes in their own creative arts discipline, while experiencing the media and creative process of an allied discipline. Commonalities and factors unique to each are examined for their potential in interdisciplinary practice.

CATS 641 Interdisciplinary Topics: Ethics in Clinical Practice in the Creative Arts Therapies (1 credit)
This course covers ethical standards and requirements for clinical practice as established by both professional mental health and creative arts therapies associations. Students become familiar with expectations of professional and personal conduct as well as models for ethical decision-making. Students also gain an understanding of their personal value systems in relation to their work as creative arts therapists and how those values may inform ethical decision-making within their clinical practice.

CATS 643 Interdisciplinary Topics: Ethics in Research in the Creative Arts Therapies (1 credit)
This course covers ethical standards and requirements for research as established by both professional mental health and creative arts therapies associations. Students become familiar with expectations of professional and personal conduct with respect to research in the field, including research protocols for both the Department of Creative Arts Therapies and Concordia University.

CATS 645 Family Systems and the Creative Arts Therapies (3 credits)
Family systems theory is introduced and specific theories and practices of family therapy are considered. Indications for the use of family therapy and its integration with the creative arts therapies are explored, as are specific methods of assessment and intervention.

CATS 689 Research Paper (9 credits)
Prerequisite: CATS 691.
The research paper is the formal culmination of graduate studies in the creative arts therapies. This paper includes a literature review, and may also include methodology, specific procedures, research population or sample, data collection and analysis, as appropriate to the topic approved by the Creative Arts Therapies Research and Ethics Committee. Students develop their proposals for this paper as a course requirement for CATS 691, to be submitted for approval to the Research and Ethics Committee in the winter term of their first year in the program. The Committee will then assign one faculty member in the Department to supervise each paper. The nine-credit component appears on the student record only once the final version of the research paper has been submitted to the Thesis Office and the Graduate Grade Activity Report Form, granting a grade of PASS, has been submitted to the Office of the Registrar.

CATS 691 Research in the Creative Arts Therapies (3 credits)
This course presents an overview of qualitative research, theory and methodology, and their application to the creative arts therapies. Students develop critical reading skills and explore ethical issues involved in research.

CATS 698 Applied Research Project with Report (6 credits)
The student chooses this option to further explore specific pilot project reports, feasibility studies and creative research designs utilizing media intrinsic to the creative arts therapies. All applied projects must include a written component and be presented as a public seminar upon completion.

CATS 699 Comprehensive Exam (3 credits)

Creative Arts Therapies Courses (Art Therapy Option)

ATRP 600 Readings in Art Therapy (3 credits)
This course provides grounding in significant schools of psychological thought and their relevance to art therapy. It also promotes advanced knowledge and understanding of the therapeutic relationship and process from a psychodynamic perspective. Studied psychotherapeutic models include: psychodynamic, object relations, humanistic, cognitive-behavioural, as well as theories of trauma.

ATRP 602 Assessment Techniques in Art Therapy (3 credits)
This course emphasizes an understanding and experience of the purpose and process of various assessments in art therapy. The theory and practice of art therapy assessment in both clinical work and research are reviewed within the context of different populations.

ATRP 603 Symbolic Imagery and Art Therapy - Studio/Workshop (3 credits)
Through experiential art workshops and readings, symbols and the symbolic/metaphoric function are examined with reference to various psychological models, including Freudian psychoanalysis, Jungian analytical psychology and Hillman's archetypal/imaginal psychology. Students develop an understanding of art therapy methodology by exploring personal imagery.

ATRP 604 Group and Family Art Therapy (3 credits)
This course provides a dialectical, experiential and practical examination of the major approaches to group dynamics, including psychodynamic, humanistic, systemic, and theories of communication. Stages, theories and clinical applications of group art therapy processes are explored.

ATRP 613 Art Therapy Practicum Supervision I (3 credits)
In this course, students acquire skills in the implementation of the principles of psychotherapy within the practices of art therapy with a selected population. Students learn observation and assessment procedures, treatment planning, skills in establishing and maintaining the therapeutic relationship, on-going evaluation, methods of clinical documentation, and professional reporting in multidisciplinary teams. Individual and group supervision are provided. A minimum of 150 practicum hours is required.

ATRP 614 Art Therapy Practicum Supervision II (3 credits)
Prerequisite: ATRP 613.
This course is a continuation of ATRP 613. A minimum of 200 practicum hours is required.

ATRP 620 Art Therapy Advanced Clinical Skills (3 credits)
This course is designed to refine students' clinical skills and deepen understanding of the practice of art therapy from a psychodynamic perspective. Through role-play experience and clinical discussion in a seminar format, therapeutic issues which students encounter during their fieldwork are explored.

ATRP 623 Advanced Art Therapy Practicum Supervision I (3 credits)
Prerequisites: ATRP 613, 614.
This course is designed to promote the consolidation of students' abilities in the practice of art therapy, to further develop clinical skills, and deepen psychotherapeutic understanding. Individual and group supervision are provided. Case presentations, readings and clinical analysis of therapeutic issues are integral to this course. A minimum of 200 practicum hours is required.

ATRP 624 Advanced Art Therapy Practicum Supervision II (3 credits)
Prerequisites: ATRP 613, 614, 623.
This course is a continuation of ATRP 623. A minimum of 250 practicum hours is required.

ATRP 630 Child and Adolescent Art Therapy (3 credits)
This course promotes an understanding of the theory and practice of art therapy with children and adolescents. Clinical applications of art therapy within diverse child and adolescent populations are examined with reference to the systemic, psychodynamic and cognitive models. Appropriate use of artistic media and play techniques are studied.

ATRP 693 Research in Art Therapy (3 credits)
Prerequisite: CATS 691.
This course is designed to foster the acquisition of knowledge and methodological tools in arts-based, qualitative and quantitative methods relevant to the field of art therapy. Emphasis is placed on the use of the practical tools necessary to conduct reliable and valid research.

Creative Arts Therapies Courses (Drama Therapy Option)

DTHY 600 Current Approaches to Drama Therapy (3 credits)
This course provides grounding in significant theoretical theories of drama therapy and correlating schools of psychological thought and their relevance to drama therapy. It also promotes advanced knowledge and understanding of the therapeutic relationship and process from several drama therapy, psychodynamic, and psychotherapeutic perspectives. Studied psychotherapeutic models include: psychodynamic, object

relations, humanistic, cognitive-behavioural, as well as theories of trauma. Drama therapy models include: role theory, projective techniques, therapeutic theatre, the use of story, and performance techniques.

DTHY 603 Improvisation and Drama Therapy - Studio/Workshop (3 credits)
This course focuses on developing skills in adapting methods of dramatic improvisation for the purpose of therapy, including exploration of projective, playback and psychodramatic techniques. Attention is given to the theory of distancing in terms of therapeutic process and dramatic form.

DTHY 604 Drama Therapy and Groups (3 credits)
This course provides a dialectical, experiential and practical examination of the major approaches to group dynamics, including psychodynamic, humanistic, systemic, and theories of communication. Stages, theories and clinical applications of group drama therapy processes are explored.

DTHY 613 Drama Therapy Practicum Supervision I (3 credits)
In this course, students acquire skills in the implementation of the principles of psychotherapy within the practices of drama therapy with a selected population. Students learn observation and assessment procedures, treatment planning, skills in establishing and maintaining the therapeutic relationship, on-going evaluation, methods of clinical documentation, and professional reporting in multidisciplinary teams. Individual and group supervision are provided. A minimum of 150 practicum hours is required.

DTHY 614 Drama Therapy Practicum Supervision II (3 credits)
Prerequisite: DTHY 613.
This course is a continuation of DTHY 613. A minimum of 200 practicum hours is required.

DTHY 623 Advanced Drama Therapy Practicum Supervision I (3 credits)
Prerequisites: DTHY 613, 614.
This course is designed to promote the consolidation of students' abilities in the practice of drama therapy, to further develop clinical skills, and deepen psychotherapeutic understanding. Individual and group supervision are provided. Case presentations, readings and clinical analysis of therapeutic issues are integral to this course. A minimum of 200 practicum hours is required.

DTHY 624 Advanced Drama Therapy Practicum Supervision II (3 credits)
Prerequisites: DTHY 613, 614, 623.
This course is a continuation of DTHY 623. A minimum of 250 practicum hours is required.

DTHY 643 Sociodrama and Psychodrama (3 credits)
Sociodrama and psychodrama practices are examined for their use as treatment modalities in drama therapy. Seminars and experiential methods of instruction integrate their practice into the aims and principles of drama therapy.

DTHY 644 Child and Adolescent Drama Therapy (3 credits)
This course focuses on the methodologies, processes, and assessment techniques as they relate to drama therapy, play and play therapy with children and adolescents, and their families.

DTHY 645 Assessment in Drama Therapy (3 credits)
Prerequisite: DTHY 644.
This course explores assessment tools developed in the field of drama therapy, including those based on such dramatic media as storytelling, role-plays, puppets and masks. The theory and practice of drama therapy assessment in both clinical work and research are reviewed within the context of different populations.

DTHY 693 Research in Drama Therapy (3 credits)
Prerequisite: CATS 691.
This course is designed to foster the acquisition of knowledge and methodological tools in arts-based, qualitative and quantitative methods relevant to the field of drama therapy. Emphasis is placed on the use of the practical tools necessary to conduct reliable and valid research.

Creative Arts Therapies Courses (Music Therapy Option)

MTHY 600 Music Therapy Advanced Literature (3 credits)
In this course, students examine music therapy and related literature in order to deepen their understanding of the influences on their own clinical and conceptual work. Cultural, musical, and theoretical frameworks are analyzed; these include psychodynamic, humanistic, cognitive behavioural, and other frameworks. Emphasis is placed on the integration of theory and music therapy process, assessment, intervention, and evidence-based practice.

MTHY 601 Music Therapy Supervision, Teaching, and Learning (3 credits)
Examination of current theories and practices in clinical music therapy supervision and in university teaching and learning. Through lectures, demonstrations, and applied practice, students develop the necessary advanced professional competencies for clinical supervision and for excellence in teaching and learning. Topics include, but are not limited to, learning styles, teaching strategies, infusion of technology in instruction, and the creation of effective learning communities.

MTHY 602 Advanced Clinical Improvisation in Music Therapy I (1.5 credits)
This course explores the applications of clinical improvisation processes in therapy and assessment. The specific focus is determined by identified student strengths and needs, and may include Nordoff and Robbins techniques; advanced piano techniques; analytical music therapy; and others.

MTHY 603 Advanced Clinical Improvisation in Music Therapy II (1.5 credits)
Prerequisite: MTHY 602, or equivalent.

Advanced study in clinical improvisation techniques in music therapy. The specific focus is determined by the identified student experience, strengths, and needs, and may include Nordoff and Robbins techniques; advanced piano and vocal techniques; analytical music therapy; and others.

MTHY 623 Advanced Music Therapy Practicum I (3 credits)
This course offers advanced clinical experience in the students' areas of specialization. Close individual and group supervision for students are provided. Case presentations, readings, discussion of ethical issues related to students' work are integral to this course.

MTHY 624 Advanced Music Therapy Practicum II (3 credits)
Prerequisite: MTHY 623.
This course provides further advanced clinical experience in students' areas of specialization. Close individual and group supervision for students are provided. Case presentations, readings, discussion of ethical issues related to students' work are integral to this course.

MTHY 625 Guided Imagery and Music, Level I (3 credits)
This course introduces students to the Guided Imagery and Music method (GIM) through demonstrations, theoretical discussion and personal experiences. Specific topics covered include: the role of music in GIM, relaxation techniques, types of imagery and basic guiding techniques, and the implementation of GIM in assessment. This course is graded on a Pass/Fail basis.

MTHY 693 Research in Music Therapy: Qualitative and Quantitative Methods (3 credits)
This course is designed to foster the acquisition of knowledge and methodological tools in qualitative and quantitative methods relevant to the field of Music Therapy. Particular emphasis is placed on acquisition of the practical tools necessary to conduct reliable and valid research to prepare students for the development of future research papers/projects in Music Therapy.

MTHY 699 Thesis (15 credits)
Prerequisite: CATS 691 and MTHY 693.
The thesis topic is chosen in consultation with the thesis supervisor, and is approved by the thesis advisory committee. Students conduct an inquiry, produce the thesis, and present it orally to their thesis advisory committee. Guidelines for the thesis are described in Thesis Preparation and Thesis Examination Regulations available from the School of Graduate Studies and the Research Handbook of the Creative Arts Therapies Department.

Graduate Certificate in Music Therapy Program Courses

MTHY 501 Music Therapy Skills (3 credits)
This course introduces students to basic materials, methods, and skills used to engage people in music

therapy. These include improvisation, performance, leadership, group management, and appropriate repertoire/materials development for various ages and populations. Participation in varied experiences include, but are not limited to, vocal and instrumental improvisation, drumming circles, movement, melodic instruments, assistive technology, integrated arts, and songwriting

MTHY 502 Psychology of Music (1 credit)
This course provides an introduction to phenomena involving music and human behaviour, including physical, acoustical, perceptual, psychological, neuropsychological, and pedagogical aspects.

MTHY 503 Music Therapy with Adults (1 credit)
This course provides in depth coverage of music therapy clinical practice with diverse adult populations. This includes assessment techniques, intervention methods and strategies, improvisation, counselling skills, and an overview of the various populations.

MTHY 504 Music Therapy with Children and Adolescents (1 credit)
This course provides in depth coverage of music therapy clinical practice with diverse child and adolescent populations. This includes assessment techniques, intervention methods and strategies, improvisation, and an overview of the various populations.

MTHY 510 Music Therapy Practicum I (3 credits)
Co-requisite: MTHY 503.
This practicum course with adults is one in a series of practica that cumulatively fulfills the requirements of the 200-hour preclinical and the 1,000-hour supervised clinical internship requirements, as stipulated by the professional program approval associations (the Canadian Association for Music Therapy and the American Music Therapy Association). Students develop as professional music therapists within a social, political and cultural context. Students acquire skills in the implementation of the principles and practices of music therapy within adult populations, including observation and assessment procedures, treatment planning, evaluation, and reporting in multi-disciplinary team settings. Students have the opportunity to explore, develop, and integrate academic and practical knowledge and skills within a clinical setting. A minimum of 300 practicum hours is required.

MTHY 511 Music Therapy Practicum II (3 credits)
Co-requisite: MTHY 504.
This practicum course within children and adolescent populations is one in a series of practica that cumulatively fulfills the requirements of the 200-hour pre-clinical and the 1,000-hour supervised clinical internship requirements, as stipulated by the professional program approval associations (the Canadian Association for Music Therapy and the American Music Therapy Association). Students develop as professional music therapists within a social, political and cultural context. Students acquire skills in the implementation of the principles and practices of music therapy within child and adolescent populations, including

observation and assessment procedures, treatment planning, evaluation, and reporting in multi-disciplinary team settings. Students have the opportunity to explore, develop, and integrate academic and practical knowledge and skills within a clinical setting. A minimum of 300 practicum hours is required.

MTHY 512 Music Therapy Practicum III (3 credits)
Prerequisites: MTHY 510 and MTHY 511.
This practicum course with diverse populations is the final in a series of practica that cumulatively fulfills the requirements of the 200-hour preclinical and the 1,000-hour supervised clinical internship requirements, as stipulated by the professional program approval associations (the Canadian Association for Music Therapy and the American Music Therapy Association). Students develop as professional music therapists within a social, political and cultural context. With a greater focus on clinical work in this practicum, students have the opportunity to specialize in a clinical population of their choice, preparing for future careers and/or graduate studies in music therapy. A minimum of 600 practicum hours is required.

MTHY 521 Clinical Improvisation in Music Therapy (3 credits)
This course explores the basic applications of clinical improvisation processes in therapy and assessment. The specific focus is determined by identified student strengths and needs, and may include Nordoff and Robbins techniques, advanced piano techniques, analytical music therapy, and others.

Film Studies

- Back to Original Version

Mel Hoppenheim School of Cinema Website

Doctor of/Doctorate in Philosophy (Film and Moving Image Studies)
Master of/Magisteriate in Arts (Film Studies)

Doctor of/Doctorate in Philosophy (Film and Moving Image Studies)

Admission Requirements. Incoming students are expected to have an MA in Film Studies (or cognate field) and a minimum *B*+ average or GPA of 3.30. Applicants will also be assessed by the School of Cinema's doctoral program sub-committee on the basis of a writing sample, letters of recommendation, research ability, and a letter of intent outlining research interests, to be submitted with their application. Prior to final acceptance, the student should have identified and contacted a potential supervisor. Final decision regarding supervision will be made by mutual agreement between the student, the doctoral program sub-committee, and the potential supervisor. Feasibility of proposed research and availability of a faculty member to supervise will also be considered. In certain instances students may be asked to complete qualifying graduate coursework. A detailed description of the program may be obtained from the PhD Program Director, Mel Hoppenheim School of Cinema.

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to fulfill 90 credits. The requirements are: 18 credits of coursework, 6 credits in the form of one comprehensive examination and one synthesis examination (3 credits each), 6 credits of thesis proposal, and 60 credits of research and thesis.
- **Residency.** The minimum required residence requirement is six consecutive terms full-time study, or the equivalent in part-time study.
- **Language.** International students whose first language is not English must meet a minimum score of 80 for TOEFL iBT (or 550 for TOEFL PBT) to be admitted to the program. While English is the dominant language for activities in the School of Cinema, applicants must demonstrate a level of competence that would allow them to read technical material in French (or another pertinent language with regards to their research). Students may write reports, examinations, and theses in English or French, as they choose.
- **Examinations.** The synthesis examination (3 credits) consists of an essay in which the candidate situates his/her work within the context of fields pertinent to training received in the School of

Cinema. The essay is evaluated by three faculty members, including the student's supervisor. The written comprehensive examination (3 credits) pertains to the candidate's major field of research and is based on a reading list (along with an appropriate and relevant filmography) prepared by the student with the assistance of his/her supervisor. The reading list (and filmography) will be approved by the doctoral program sub-committee who may suggest some changes. The reading list will fall within one of these headings:

Film and Moving Image History
Film and Moving Image Aesthetics
Film and Moving Image Theory
Film, Moving Image and Cultural Theory

- **Thesis Proposal.** Once the examinations are completed students are eligible to submit their thesis proposal (it must be submitted no later than the second week of September of the third year into the program). The thesis proposal consists of a 40 to 60 page document outlining the object of study of the thesis, its objectives, the research hypothesis and the methodology that will be used or developed. A detailed bibliography will accompany the document as well as a preliminary table of contents. The thesis proposal must be defended orally before a jury consisting of the student's supervisor and two faculty members.
- **Research and Thesis.** A major portion of the doctoral program is the planning and execution of innovative and original research under the direction of a supervisor. The student's research will be presented in a written thesis (length: average of 300 pages) and defended orally in conformity with the regulations outlined in Concordia University's Graduate Calendar. The candidate will submit his/her doctoral thesis to an examining committee consisting of at least five faculty members: the candidate's supervisor, two faculty members from the Mel Hoppenheim School of Cinema, a faculty member from another department within Concordia (external-to-program examiner), and an external-to-University faculty member.

Academic Regulations

- **Academic Standing.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students who receive more than one *C* grade during the course of their PhD studies will be required to withdraw from the program. Students may apply for re-admission. Students who receive another *C* after re-admission will be required to withdraw from the program and will not be considered for re-admission.

- **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade, or a *C* grade, after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a doctoral degree must be completed within 18 terms (6 years) of full-time study from the time of original registration in the program.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Time line for requirements

Course work (18 credits). It is expected that students will, on average, complete 12 credits of coursework during the first year and 6 credits during the second year. On a yearly basis a minimum of 12 credits of core graduate coursework will be offered for doctoral students only by the School of Cinema. This includes the 6-credit Proseminar. A detailed description of the course requirements is as follows:

- Core: 6 credits: Proseminar
- Cluster: 6 credits: taken from four topics clusters of seminars labeled: Topics in Film and Moving Image History; Topics in Film and Moving Image Aesthetics; Topics in Film and Moving Image Theory; Topics in Film, Moving Image and Cultural Theory.
- Electives: 6 credits taken from research seminars in the Mel Hoppenheim School of Cinema and/or taken from graduate course offerings outside the School of Cinema.

Examinations (6 credits). Synthesis and comprehensive examinations will be conducted during the second year of residency (no later than the second week of March for the synthesis examination and the second week of August for the comprehensive examination). Comprehensive examination: Four months after the reading list is approved students will receive a list of four questions. They will have two weeks to produce an essay to answer the questions. The essay will be evaluated by a jury of three faculty members, including the student's supervisor.

Thesis proposal (6 credits). To be submitted after successful completion of the synthesis and comprehensive examinations.

Courses

Core and Cluster Course
Each year the program will offer FMST 800 and two cluster courses.

Core Course:

FMST 800 Proseminar (6 credits)
The Proseminar is designed to give students a broad introduction to advanced film and moving image research by putting different periods, research methodologies, theories, or genres into dynamic relation. Written assignments will be required as well as an oral presentation.

Cluster Courses (Topics Clusters):
The specific content of the seminars in each of the four topics clusters will be decided by the doctoral program joint committee on a yearly basis, based on course proposals made by accredited faculty.

Cluster A:

FMST 801 Seminar in Film and Moving Image History (3 credits)
Advanced study and research in problems and issues related to film and moving image history and historiography. Topics for seminars in this cluster may include: Methods in Film Historiography; Methodological Aspects of Film-Archival Research; History of Film Technology; History of Film Institutions; History of Pre-Cinema and Early Cinema; History of Silent Cinema; History of Film Movements; History of Documentary Film; History of New Media.

Cluster B:

FMST 802 Seminar in Film and Moving Image Aesthetics (3 credits)
Advanced study and research in problems and issues of film aesthetics. Students examine the style associated with certain films, directors, genres, and national cinemas, or investigate film criticism and taste cultures. Topics for seminars in this cluster may include: Topics in Film Style and Form; Topics in Film Criticism; Film and the Other Arts: Topics in Aesthetic Theory; Topics in Directors; Topics in Moving Image and New Media Art: New Media Aesthetics; Performance.

Cluster C:

FMST 803 Seminar in Film and Moving Image Theory (3 credits)
Seminars in this cluster offer an in-depth investigation of a theory or a theoretical tradition in Film and Moving Image Studies. The course may focus on the work of a single theorist, or a particular approach or methodology. Topics for seminars in this cluster include: Interpretation and Hermeneutics; Reception Theory Narrative Theory; Topics in Classical Film Theory; Topics in Contemporary Film Theory; Topics in Film and Philosophy; Psychoanalysis and Film; Genre Theory; Semiotics; Topics in Cognitive Theory; Textual Analysis.

Cluster D:

FMST 804 Seminar in Film, Moving Image and Cultural Theory (3 credits)
Seminars in this cluster investigate film and the moving image from social and cultural perspectives. Topics

for seminars in this cluster may include: Cinema and Modernity; Postmodernity and Globalization; Film, New Media, and Visual Culture, Queer Theory; Feminist Theory; Post-colonial Theory; Topics in Social and Political Theory; Topics in Cultural Studies, Film in the Context of Television and Consumer Culture.

Elective Courses (Joint MA/PhD seminars):

Students will take a maximum of 9 credits of elective coursework. Students will be entitled to enrol in PhD seminars that are cross-listed with MA seminars, provided they will not repeat seminars taken at Concordia during their MA degree. (Doctoral students registered in these courses will be expected to perform at PhD level).
Note: The focus of any given topics course on a given year will determine the cluster to which it will belong. For example, "Topics in Cinéma Québécois" may belong to Cluster A when the focus is on historiography or it may belong to Cluster B when the course centers on aesthetic issues in Québec cinema.

FMST 805/FMST 605 Topics in English Canadian Cinema (3 credits)
This seminar explores the spectrum of Canadian cinema and video produced in English, and features screenings of historical and contemporary works within fiction, documentary and experimental areas, and in some instances, video and television as well. The culture, political and institutional contexts of production and reception are emphasized, with textural analysis at the core.
Note: Students who have received credit for a topic in FMST 605 may not take that same topic under FMST 805 for credit.

FMST 810/FMST 610 Topics in Cinema Québécois (3 credits)
The course explores Québécois cinema culture. Emphasis is placed on the cultural and political contexts of production and reception. Topics may include the structure of the film industry in Québec, the role of the NFB and other institutions, avenues of distribution and exhibition, also particular groups of films, such as cinema direct, or on specific time periods, or the work of specific filmmakers.
Note: Students who have received credit for a topic in FMST 610 may not take that same topic under FMST 810 for credit.

FMST 815/FMST 615 Topics in European Cinema (3 credits)
This course covers topics in Russian, German, French, Italian, British, Spanish and Eastern European Cinemas. Questions of national culture, patterns of film production, distribution and reception, and aesthetic histories are covered. The course incorporates future experimental and documentary films as well as readings in specific cultural histories.
Note: Students who have received credit for a topic in FMST 615 may not take that same topic under FMST 815 for credit.

FMST 820/FMST 620 Topics in Non-European Cinema (3 credits)
This course focuses on Asian, African and South American filmmaking, film cultures and film industries, and comparative studies of issues pertinent to more than one of these cultures.
Note: Students who have received credit for a topic in FMST 620 may not take that same topic under FMST 820 for credit.

FMST 825/FMST 625 Topics in Film History (3 credits)
This course explores specific problems and methods of film historiography, and examines the practices associated with one or more of these methods. Course topics emphasize various historiographic methods and theories, problems of methodology and analysis.
Note: Students who have received credit for a topic in FMST 625 may not take that same topic under FMST 825 for credit.

FMST 830/FMST 630 Topics in Film Theory (3 credits)
This course is devoted to close readings of key tests in film theory, examining their background, intellectual histories, and analyzing their significance. Topics may concentrate on historical developments in film theory, or they may address a given method or approach.
Note: Students who have received credit for a topic in FMST 630 may not take that same topic under FMST 830 for credit.

FMST 835/FMST 635 Topics in Aesthetics and Cultural Theory (3 credits)
This course examines the broader cultural and aesthetic histories relevant to film theory and practice. These theories are studied in depth, beyond the limits of film studies, in order to situate film history and theory within other interdisciplinary perspectives. Topics may include postmodernism, modernism, philosophical aesthetics, sexual representation, Frankfurt School theory, postcolonialism, Marxism, deconstruction, and psychoanalysis.
Note: Students who have received credit for a topic in FMST 635 may not take that same topic under FMST 835 for credit.

FMST 840/FMST 640 Gender Issues in Film (3 credits)
This course provides an opportunity to contextualize a range of historical and theoretical feminist positions, and women's film practices. Sample course topics include pornography, experimental feminist praxis, gender and race, or constructions of gender in specific historical periods or countries.
Note: Students who have received credit for a topic in FMST 640 may not take that same topic under FMST 840 for credit.

FMST 845/FMST 645 Topics in Film Genres (3 credits)
This course explores specific narrative film genres, such as the musical, the western, comedy, horror, melodrama and film noir. In each case, the history of the genre and its socio-historical dimensions is

explored. Questions of genre transformation, popular mythology, cultural sources and parallel media, institutional analysis (studio practices) and spectatorship are addressed.
Note: Students who have received credit for a topic in FMST 645 may not take that same topic under FMST 845 for credit.

FMST 850/FMST 650 Topics in Experimental Film and Video (3 credits)
This course examines the history, aesthetics, theory and practice of experimental/avant-garde film and video, and may be organized around specific bodies of work, or theoretical issues such as the politics of representation, pure cinema, poetic structures, reflexivity, or documentary representation. Questions of medium specificity, modernism/postmodernism, performance art and theory, exhibition, distribution, canonization and criticism are addressed.
Note: Students who have received credit for a topic in FMST 650 may not take that same topic under FMST 850 for credit.

FMST 855 (PhD)/FMST 655 (MA) Topics in Documentary (3 credits)
Documentary history, aesthetics and theory are addressed in this course Questions of ideology, narrative and style in the context of specific groups of films are studied. Topics may relate to specific countries, histories, methods, institutions and cultural issues and methodological and theoretical problems arising from the concomitant evolution of television journalism, rapidly evolving technology, and changing patterns of exhibition and reception are examined.
Note: Students who have received credit for a topic in FMST 655 may not take that same topic under FMST 855 for credit.

FMST 860 (PhD)/FMST 660 Topics in Film Directors (3 credits)
This course examines the work of one or more specific directors from stylistic, aesthetic, cultural and historical perspectives. Directors that may be studied include Welles, Dreyer, Eisenstein, Hitchcock, Lang, Pasolini, Godard, Von Sternberg, Akermann and Arzmer, have been the foundation of extensive film studies scholarship.
Note: Students who have received credit for a topic in FMST 660 may not take that same topic under FMST 860 for credit.

FMST 865/FMST 665 Topics in Film Studies (3 credits)
From time to time, courses in topics that do not fit into any of the topics courses listed above are offered. These courses may include technical studies such as film acting, or special topics related to an instructor's research project.
Note: Students who have received credit for a topic in FMST 665 may not take that same topic under FMST 865 for credit.

Other elective courses

FMST 870 Independent Study (3 credits)
Independent Study courses offer students opportunities to research and write about particular topics in film studies that are not covered in the courses offered in a given year. Students must propose a topic to a full-time faculty member, under whose supervision they complete the course.

FMST 880 Research Seminar (3 credits)
Film Studies faculty in the School of Cinema may organize seminars on a current research project.

Other program activities

FMST 885 Thesis Proposal (6 credits)
Once the examinations are completed students are eligible to submit their thesis proposal (it must be submitted no later than the second week of September or the third year into the program). The thesis proposal consists of a 40 to 60 page document outlining the object of study of the thesis, its objectives, the research hypothesis and the methodology that will be used or developed. A detailed bibliography will accompany the document as well as a preliminary table of contents. The thesis proposal must be defended orally before a jury consisting of the student's supervisor and two faculty members.

FMST 886 Synthesis Exam (3 credits)
A synthesis examination which will consist of a 40 to 60 page essay in which the candidate situates his/her work within the context of fields pertinent to training received in the School of Cinema.

FMST 887 Comprehensive Exam (3 credits)
A written comprehensive examination pertains to the candidate's major field of research. A reading list of approximately 50 books and essays along with an appropriate and relevant filmography will be prepared by the student with the assistance of his/her supervisor.

FMST 890 Research and Thesis (60 credits)
A major portion of the doctoral program is the planning and execution of innovative and original research under the direction of a supervisor. The doctoral thesis defence will be an oral examination conducted by a chair who shall be the Dean of Graduate Studies or a delegate.

Master of/Magisteriate in Arts (Film Studies)

Admission Requirements. Incoming students will be expected to have a degree in film studies with a minimum *B* average (GPA 3.00) in their undergraduate degree. Applicants may be requested to attend an interview with the graduate committee. All applicants will be required to submit an example of their writing on cinema, and a letter of intent.

Some applicants who have undergraduate degrees in other programs will also be considered. These students must have a strong interest in cinema from the perspective of other disciplines such as art history, film production, communications, English, French, sociology, philosophy, history or political science. Students applying from non-film studies programs must demonstrate to the committee that they have a basic knowledge of core film studies materials. Qualified applicants lacking prerequisite courses may be required to take up to 12 undergraduate credits (or the equivalent, to be approved by the Department's Graduate Studies Committee) in addition to the regular graduate program.

Requirements for the Degree

- **Credits.** A fully qualified candidate is required to complete a minimum of 45 credits.
- **Residence.** All options have a minimum residence requirement of three terms of full-time study or the equivalent in part-time study.
- **Language.** All students are expected to have a reading knowledge of English and French at the time they begin classes. Courses will be conducted in English, although French texts may be assigned on occasion. Written and oral assignments may be submitted in either English or French. Students who cannot read both French and English texts comfortably should begin their remedial language work before starting classes. A test will be administered by the department to ensure a functioning competency in French for those students whose first language is English or another language. All students must pass this test before receiving their degree, except those who demonstrate to the Graduate Program Director that they are fluently bilingual. A student may also apply to be exempted from the French language test should competency in a language other than English or French be pertinent to the student's research. This competency must be verified by the GPD.
- **Courses.** The program offers two different options to fulfill degree requirements. All students may take 9 of their required additional course credits in graduate courses offered by other departments in the university. Such courses must be approved by the Department's Graduate Studies Committee, with permission of the other department concerned. Both program options outlined below require original research.

Academic Regulations

- **Academic Standing.** Students are expected to complete all courses credited toward the master's degree with a grade of *B* or higher. Under certain conditions one *C* grade may be permitted. Students should consult the written explanation of the department's rule regarding acceptable academic performance, available in the department's graduate office.
- **C Rule.** A student who receives a *C* for a course will receive credit for that course, but only one *C* grade may count toward the degree. A student receiving a second *C* will be withdrawn from the program, regardless of their GPA.

- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** A full-time student will normally complete all work for either degree option within two years. All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts With Thesis (Option A)

Candidates are required to take 6 credits in Methods and 3 credits in either Canadian Cinema or Cinéma Québécois, plus 9 additional course credits. They will also take 27 credits of Research and Thesis. The maximum value of practicum (internship) credits allowable in this option is 6.

In admitting students to this option, the Graduate Program Director will ensure that a potential supervisor exists within the faculty for the student's research area. The onus is on the student, however, to secure a member of the faculty to supervise the thesis. Theses must be submitted to the department at least six weeks prior to the submission deadline given in the graduate calendar. The examination committee will consist of three faculty members, and will be chaired by the Graduate Program Director, who will remain a neutral member of the committee. The GPD may appoint an alternate chair if he or she is a supervisor or reader of the thesis.

Master of/Magisteriate in Arts without Thesis (Option B)

Candidates are required to take 6 credits in Methods and 3 credits in either Canadian or Québécois Cinema, plus 36 additional course credits. In each course, students are required to submit a research paper and make an oral presentation. In this option, students would become familiar with a broad range of methodologies and film practices. Within this framework, they may also be able to pursue specific areas of interest by enroling in independent studies, internships, or taking courses in other departments in the university. The maximum number of practicum (internship) credits allowable in this option is 12.

Practicum Credits

A student may receive credit for work at film institutions (e.g. festivals, archives), periodicals, educational or production establishments and for academic professional internships. Each internship must be approved in advance by the Program Director and the student must consult with an academic supervisor. The duties will be supervised by an individual within the sponsoring organization, in consultation with an academic adviser,

to ensure that the student's responsibilities are in keeping with aims of the MA program. The academic advisor will determine the credit value of each internship, which will be evaluated on the basis of the student's written report. The report should demonstrate the student's understanding of the organization's social and cultural role as well as an analysis of the activities and functioning of the organization. The 3-credit practicum should involve at least 135 hours at the host institution. The 6-credit internship has the same requirements and provisions as the 3-credit internships, except that the student is expected to do twice the work (270 hours). This may occur in a concentrated period of time (one semester), or may be taken over two consecutive semesters.

Courses

Each year the program will offer FMST 600, either FMST 605 or FMST 610, plus a selection of courses from those listed below.

FMST 600 Methods in Film Studies (6 credits)
FMST 605 Topics in English Canadian Film (3 credits)
FMST 610 Topics in Québécois Cinema (3 credits)
FMST 615 Topics in European Cinemas (3 credits)
FMST 620 Topics in Non-European Cinemas (3 credits)
FMST 625 Topics in Film History (3 credits)
FMST 630 Topics in Film Theory (3 credits)
FMST 635 Topics in Aesthetics and Cultural Theory (3 credits)
FMST 640 Gender Issues in Film (3 credits)
FMST 645 Topics in Film Genres (3 credits)
FMST 650 Topics in Experimental Film and Video (3 credits)
FMST 655 Topics in Documentary (3 credits)
FMST 660 Topics in Film Directors (3 credits)
FMST 665 Topics in Film Studies (3 credits)
FMST 670 Independent Study (3 credits)
FMST 675 Practicum (3 credits)
FMST 680 Practicum (3 credits)
FMST 685 Practicum (6 credits)
FMST 690 MA Research and Thesis (24 credits)

Studio Arts

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Studio Arts Website

Master of/Magisteriate in Fine Arts (Studio Arts)

Admission Requirements. A Bachelor of Fine Arts or a Bachelor of Arts with a Fine Arts or Fine Arts and Art History major, or an approved equivalent, from a recognized institution and with at least a *B* average in the major area is required. Applicants to the Film Production concentration are expected to have a Bachelor of Fine Arts or Bachelor of Arts degree in cinema or an approved equivalent with at least a *B* average in the major area. In all cases the students' undergraduate experience and proficiency must be relevant to the area in which they plan to specialize at the graduate level.

Note: Students with a BFA from Concordia University must wait two (2) years before being considered for admission into the MFA program.

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete a minimum of 60 credits.
- **Residence.** The minimum residence requirement is 5 terms of full-time study. It should be noted that one of these terms is a summer session. Following the residency, candidates will prepare for their Studio Project and Exhibition or Film Project (see 4 below).
- **Courses.** Candidates for the degree are normally required to complete a minimum of 24 credits in their studio concentration and 3 credits of DISP 615 Directed Studio Practice; 21 credits from ASEM 620, 641, 642, 643, 644, 645, 646, 651, 652, 653, 654, INTP 660, 661, 662, INDS 670, 671, 672; 9 credits in PROJ 691 Studio Project and 3 credits in PROJ 692 Exhibition or Film Project.
- **Studio Project and Exhibition or Film Project.** In the third or fourth year and no less than six (6) months following the successful completion of the second year of course work, students may present their studio project and complete the exhibition or film project. Approval by both the student's advisor and the graduate program director is required prior to the examination. Students are also required to submit documentation of their exhibition or film project to be kept on file in the office of the graduate program director.

Academic Regulations

- **Academic Standing.** Students are expected to complete all courses credited toward the master's/magisteriate degree with a grade of *B* or better.
- **C Rule.** Under certain conditions one *C* grade in a course may be permitted. Students should consult the graduate program director for further elaboration.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

Each year the Faculty of Fine Arts offers a selection of courses from the Studio Arts and Cinema departments. A list of those courses, as well as information about the specific content of the seminar offerings is available from the MFA Studio Arts office.

Studio Courses

CERA 610 Ceramics I (6 credits)
A studio course providing an opportunity for intense investigation into a broad range of issues in ceramics and other disciplines. Under the supervision of a professor the structure of the course allows each participant to pursue independent interests.

CERA 611 Ceramics II (6 credits)
A continuation of CERA 610.

CERA 612 Ceramics III (6 credits)
A continuation of CERA 611.

CERA 613 Ceramics IV (6 credits)
A continuation of CERA 612.

FMPR 610 Film Production I (6 credits)
A studio course providing an opportunity to do advanced work in aesthetic and technical aspects of filmmaking with an emphasis on independent production.

FMPR 611 Film Production II (6 credits)
A continuation of FMPR 610.

FMPR 612 Film Production III (6 credits)
A continuation of FMPR 611.

FMPR 613 Film Production IV (6 credits)
A continuation of FMPR 612.

FBRS 610 Fibres I (6 credits)
A studio course providing an opportunity for intense investigation in fibres as well as other disciplines. Under the supervision of a professor, the structure of the course allows each student to pursue independent interests.

FBRS 611 Fibres II (6 credits)
A continuation of FBRS 610.

FBRS 612 Fibres III (6 credits)
A continuation of FBRS 611.

FBRS 613 Fibres IV (6 credits)
A continuation of FBRS 612.

OPME 610 Open Media I (6 credits)
A studio course encompassing an unlimited range of materials, combination of disciplines and approaches to media. Under the supervision of a faculty member, the structure of the course allows each participant to pursue independent studio practice.

OPME 611 Open Media II (6 credits)
A continuation of OPME 610.

OPME 612 Open Media III (6 credits)
A continuation of OPME 611.

OPME 613 Open Media IV (6 credits)
A continuation of OPME 612.

PTNG 610 Painting I (6 credits)
A studio course providing opportunity for intense investigation into a wide range of approaches to painting.

Under the supervision of a professor the structure of the course allows each student to pursue individual interests in painting.

PTNG 611 Painting II (6 credits)
A continuation of PTNG 610.

PTNG 612 Painting III (6 credits)
A continuation of PTNG 611.

PTNG 613 Painting IV (6 credits)
A continuation of PTNG 612.

PHOT 610 Photography I (6 credits)
A studio course providing investigation into a broadly defined concept of photography. Under the supervision of a professor each student pursues independent studio practice.

PHOT 611 Photography II (6 credits)
A continuation of PHOT 610.

PHOT 612 Photography III (6 credits)
A continuation of PHOT 611.

PHOT 613 Photography IV (6 credits)
A continuation of PHOT 612.

PRIN 610 Print Media I (6 credits)
A studio course providing intense investigation of the technical and theoretical concerns of diverse forms of print media. Under the supervision of a professor, each student pursues independent studio practice.

PRIN 611 Print Media II (6 credits)
A continuation of PRIN 610.

PRIN 612 Print Media III (6 credits)
A continuation of PRIN 611.

PRIN 613 Print Media IV (6 credits)
A continuation of PRIN 612.

SCUL 610 Sculpture I (6 credits)
A studio course offering the opportunity for intense investigation into the formation of visual and material culture in art. Under the supervision of a professor each student may pursue independent studio practice.

SCUL 611 Sculpture II (6 credits)
A continuation of SCUL 610.

SCUL 612 Sculpture III (6 credits)
A continuation of SCUL 611.

SCUL 613 Sculpture IV (6 credits)
A continuation of SCUL 612.

DISP 615 Directed Studio Practice (3 credits)
Under the guidance of an instructor, students will pursue a directed studio practice.

Seminars

ASEM 620 Art: Ideas and Practices (3 credits)
This seminar addresses the relationship between theory and studio practice. Professional and practical issues facing the artist will be discussed.

ASEM 641 Seminar in Contemporary Art (6 credits)
This course addresses issues which situate and inform artists and their work.

ASEM 642 Seminar in Contemporary Art (3 credits)
This course addresses issues which situate and inform artists and their work.

ASEM 643 Special Topics in Art and Ideology (6 credits)
Special topics will address a variety of issues that are factors in the making, presentation and the situating of art in society.

ASEM 644 Special Topics In Art and Ideology (3 credits)
Special topics will address a variety of issues that are factors in the making, presentation and the situating of art in society.

ASEM 645 Special Topics in Art and Culture (6 credits)
Topics are drawn from a variety of discourses to address the construction of identity in contemporary art and society.

ASEM 646 Special Topics in Art and Culture (3 credits)
Topics are drawn from a variety of discourses to address the construction of identity in contemporary art and society.

ASEM 651 Special Topics in Media Arts (6 credits)
Topics may address a wide range of critical fields related to media art practices, examining both conventional and non-traditional artworks such as performance, audio, video, and computer art, as well as other media.

ASEM 652 Special Topics in Media Arts (3 credits)
Topics may address a wide range of critical fields related to media art practices, examining both conventional and non-traditional artworks such as performance, audio, video, and computer art, as well as other media.

ASEM 653 Aspects of Contemporary Cinema (6 credits)
This seminar examines critical issues in contemporary cinema.

ASEM 654 Aspects of Contemporary Cinema (3 credits)
This seminar examines critical issues in contemporary cinema.

Internship and Independent Study

INTP 660 Professional Internship (6 credits)
Prerequisite: 21 credits completed in the MFA Program. Internship proposal must be supported by a full-time faculty member and approved with written permission by the MFA Graduate Program Director.
Under the joint supervision of a qualified professional and a full-time faculty member the student will be employed within industry, or by a professional organization or other relevant affiliation. Assessment is based upon a required paper, contributions to supervisory sessions and the successful completion of the internship (300 hours).

INTP 661 Professional Internship I (3 credits)
Prerequisite: 21 credits completed in the MFA Program. Internship proposal must be supported by a full-time faculty member and approved with written permission by the MFA Graduate Program Director.
Under the joint supervision of a qualified professional and a full-time faculty member the student will be employed within industry, or by a professional organization or other relevant affiliation. Assessment is based upon a required paper, contributions to supervisory sessions and the successful completion of the internship (150 hours).

INTP 662 Professional Internship II (3 credits)
Prerequisite: 21 credits completed in the MFA Program. Internship proposal must be supported by a full-time faculty member and approved with written permission by the MFA Graduate Program Director.
Under the joint supervision of a qualified professional and a full-time faculty member the student will be employed within industry, or by a professional organization or other relevant affiliation. Assessment is based upon a required paper, contributions to supervisory sessions and the successful completion of the internship (150 hours).

INDS 670 Independent Study (6 credits)
Prerequisite: 21 credits completed in the MFA Program. Independent study proposal must be supported by a full-time faculty supervisor and approved with written permission by the MFA Graduate Program Director.
The student explores a specific field or topic relevant to their area of study.

INDS 671 Independent Study I (3 credits)
Prerequisite: 21 credits completed in the MFA Program. Independent study proposal must be supported by a full-time faculty supervisor and approved with written permission by the MFA Graduate Program Director.
The student explores a specific field or topic relevant to their area of study.

INDS 672 Independent Study II (3 credits)
Prerequisite: 21 credits completed in the MFA Program. Independent study proposal must be supported by a full-time faculty supervisor and approved with written permission by the MFA Graduate Program Director.
The student explores a specific field or topic relevant to their area of study.

Studio Project and Examination

PROJ 691 Studio Project (9 credits)
With the guidance of a faculty advisor, students prepare work leading to an exhibition or film project.

PROJ 692 Exhibition or Film Project (3 credits)
Following the successful completion of the Studio Project, the student prepares a professional-level presentation within a public forum (gallery, screening room, etc.) accompanied by an artist's statement. The candidate meets with an Examination Committee to describe the evolution of the work and to situate it in the context of current practice and theory. The Committee will question the student and determine whether or not to recommend that the student be awarded the MFA degree.

Music

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Music Website

Note: Admissions have been suspended for the Diploma in Advanced Music Performance Studies for the 2012-2013 academic year.

Diploma in Advanced Music Performance Studies

Admission Requirements. Applicants must present evidence of highly developed skills in performance and will possess minimally a bachelor's degree in performance or an equivalent professional certificate. Under exceptional circumstances, candidates may be accepted on the basis of audition alone, or by examination and/or proof of professional study in a recognized program. Students requiring background in certain areas essential to their proposed program of study may be asked to take qualifying courses. An audition should consist of a representative program of minimum 20 minutes duration. Non-resident candidates should prepare an unedited videotape, but may be asked to audition on arrival.

Requirements for the Diploma

- **Credits.** A fully-qualified candidate is required to complete a minimum of 30 credits. Each candidate's program of study will be chosen in consultation with the Graduate Program Director.
- **Residence.** A candidate enrolled on a full-time basis will normally complete the program in two years. Exceptions may be granted by the Graduate Program Director.
- **Recital performances.** Each candidate must successfully complete two recital performances (AMPS 520: Recital I and AMPS 530: Recital II, 6 credits each). The recital programs will be chosen in consultation with the candidate's program advisor and approved by the Graduate Studies committee. The program advisor will supervise the preparation of the recitals. Final evaluations will be made by a jury chosen by the Graduate Studies committee.
- **Courses.** Candidates must complete 6 credits of private instrumental or vocal instruction (AMPS 521/531) with a minimum average grade of *B*. A minimum of 3 credits must be completed from the seminar/workshop courses (AMPS 501, 503, 505, 507, 509). In addition, the candidate is expected to participate in orchestral or ensemble performance. Exceptions may be granted by the Graduate Program Director.

Academic Regulations

- **GPA Requirement.** Students having completed at least four courses are assessed at the end of each academic year based on creditable courses completed after their first registration in the program. To be permitted to continue, students must have obtained a cumulative grade point average of at least 2.70.
- **C Rule.** Normally a student receiving a grade of *C* in two courses will be required to withdraw from the program. Students withdrawing for this reason may petition the Diploma Committee for special consideration. In cases of extenuating circumstances probationary continuation in the program will be considered.
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for re-admission. Students who receive another failing grade after re-admission will be withdrawn from the program and will not be considered for re-admission.
- **Time Limit.** All work for a diploma program must be completed before or during the calendar year, two years from the year of initial registration in the program for full-time students; for part-time students the time limit is four calendar years.
- **Graduation Requirement.** To graduate, students must have completed all course requirements with a cumulative grade point average of at least 2.70.

Courses

AMPS 501 Seminar - Workshop in Performance Skills (3 credits)
(This course may be repeated as AMPS 502)
An intensive developmental course for individual and group performance. A broad range of subjects will be explored including practice methods, effective rehearsing, repertoire research, program-building, memorization, improvisation, and approaching auditions and competitions.

AMPS 503 String Seminar (3 credits)
(This course may be repeated as AMPS 504)
This course examines specific aspects of performance and repertoire studies for stringed instruments.

AMPS 505 Piano Seminar (3 credits)
(This course may be repeated as AMPS 506)
This course examines specific aspects of performance and repertoire studies for piano.

AMPS 507 Voice Seminar (3 credits)
(This course may be repeated as AMPS 508)
This course examines specific aspects of performance and repertoire studies for voice.

AMPS 509 Organ and Harpsichord Seminar (3 credits)
(This course may be repeated as AMPS 510)
This course examines specific aspects of performance and repertoire studies for organ and harpsichord.

AMPS 511 Chamber Ensembles (3 credits)
(This course may be repeated as AMPS 512)
Ensembles work intensively on preparation and presentation of public performances or competitions.

AMPS 513 Orchestra (3 credits)
(This course may be repeated as AMPS 514)
Preparation and public performance with orchestra of one or several works as soloist or principal player.

AMPS 515 Performance Practices (3 credits)
(This course may be repeated as AMPS 516)
Individual projects in particular aspects of performance practice such as *basso continuo*, ornamentation, the cadenza, contemporary performance techniques, improvisation.

AMPS 517 Special Project in Music (3 credits)
(This course may be repeated as AMPS 518)
Individual projects in music theory, analysis, composition, aesthetics, music history, or inter-disciplinary studies connected with music.

AMPS 519 Recording Production (3 credits)
An audio recording is made in partnership with an advanced recording student. The performer works with an advanced recording student to experiment with various sound recording possibilities, placement and type of microphones, creation of resonance, ambience, “honesty” vs. enhancement, etc. involving several sessions which could include listening to recordings the performer particularly enjoys or dislikes. The advanced recording student is responsible for producing a high-quality digitally edited recording (DAT or CD-R).

AMPS 520 Recital I (6 credits)

AMPS 521 Private Instrumental or Vocal Instruction I (3 credits)
Note: This is a full year course.

AMPS 530 Recital II (6 credits)

AMPS 531 Private Instrumental or Vocal Instruction II (3 credits)
Note: This is a full year course.

AMPS 598 Special Topics in Music Performance Studies (3 credits)

AMPS 599 Special Topics in Music Performance Studies (6 credits)

Design & Computation Arts

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Design and Computation Arts Website

Master of/Magisteriate in Design
Graduate Certificate in Digital Technologies in Design Art Practice

Master of/Magisteriate in Design

Admission Requirements. Applicants must hold an undergraduate degree or a graduate diploma in Design or equivalent in a relevant undergraduate degree program, with very high standing. Applicants with non fine arts degrees must demonstrate technical and artistic/scholarly competence in their desired research area and must exhibit a strong foundation in design practices from an interdisciplinary perspective. Qualified applicants requiring prerequisite courses may be required to take such courses in addition to their regular graduate program. Admission to the program is competitive and applicants with high academic standing will be considered. Applicants must have a minimum cumulative GPA of 3.00 on a scale of 4.30.

Students interested in applying to the program should submit a portfolio of creative work, writing samples, a letter of intent, and a five-page preliminary research proposal. The letter of intent should contain a well-articulated description of the potential research foci, indicating a relevant contribution to design or design scholarship. The accompanying preliminary research proposal should include well-formulated research questions, addressing the theoretical frameworks in which question will be addressed, potential outcomes, and a justification of the relevance of the topic. The proposal must also include an assessment of the feasibility of the proposed research over three consecutive semesters, demonstrating evidence of knowledge and skills relevant to the program and proposed area of concentration. Admission is contingent on the availability of an appropriate faculty member in the Department of Design and Computation Arts who agrees to serve as thesis supervisor. Applicants are encouraged to select a supervisor in advance, before admission. In special circumstances, the supervisor can be selected at the latest by the end of the first semester.

In addition to the proposal documentation, applicants must arrange for official transcripts from all previous post-secondary studies and three letters of reference (at least two from academic sources) to be sent. Following initial review of the application dossiers, selected candidates will be invited to interview with the Admissions Committee. Local residents are expected to appear in person while remote applicants will have the option to be interviewed through teleconferencing or video conferencing. It is incumbent upon remote applicants to make financial arrangements should they choose to attend the interview in person.

Qualified applicants lacking prerequisites or competencies may be required to complete additional undergraduate credits (or the equivalent, to be approved by the Admissions Committee) in addition to the regular graduate program requirements.

Applicants whose first language is other than English must demonstrate proficiency in the English language by writing one of the approved language tests. The provisional minimum acceptance score for the Internet-based Test of English as a Foreign Language (TOEFL iBT) for admission into a graduate program for international students whose first language is not English or French is 80. (Concordia will accept test results for the paper-based TOEFL if they are less than 2 years old). The minimum required score for the paper-based TOEFL is 550. The IELTS (International English Language Testing System) requires a minimum Band score of 6.5. Applicants whose prior degrees are not from an English or French speaking university may be required to submit English Language Test scores (TOEFL iBT).

Requirements for the Degree

- **Credits.** A fully-qualified candidate is required to complete 45 credits.
- **Residence.** The minimum required residency is three consecutive semesters of full-time study, or the equivalent in part-time study.
- **Courses.** All students are required to take the following core courses (with a 3-credit value, unless otherwise specified): DART 600 Design Theory/Practice I, DART 601 Research Methods in Design, DART 610 Design Theory/Practice II, DART 611 Interdisciplinary Practices in Design, DART 620 Graduate Colloquium, DART 690 Master's Research and Thesis (24 credits). Six additional elective credits are required of all candidates, to be chosen in consultation with the thesis director, Elective credits are to be taken from a small pool of special topics courses offered by the Department, or by special permission, outside the Department.
- **Thesis Project.** In addition to the required course work, students will undertake a Master's Research and Thesis, which will combine a body of work or practice-led research with a written thesis document of 40-55 pages that contextualizes the practice historically and theoretically and reflects critically on the process and production. A formal oral defense and a final public exhibition of the work or practice-led research are required.
- **Language Requirements.** While there are no formal language requirements, students intending to work in Quebec are strongly encouraged to develop a working knowledge of French.

Academic Regulations

- **Academic Standing.** The Academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) or 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 after 6 credits will be considered to be on academic probation during the following review period. Students whose GPA

falls below 3.00 for two consecutive review periods will be withdrawn from the program. The GPA requirement will be reviewed by the GPD.

- **C Rule.** Students who obtain a *C* grade in a course will be required to repeat the course or take another course to be chosen in consultation with the thesis director together with the Graduate Program Director. Students receiving more than one *C* grade will be withdrawn from the program. Students should consult the School of Graduate Studies' guidelines and policies regarding the minimum standards for Master's/Magisteriate Programs (see Academic Regulations section).
- **F Rule.** Students who receive a failing grade in the course of their studies will be withdrawn from the program. Students may apply for readmission. Students who receive another failing grade after re-admission will be withdrawn from the program and may not reapply.
- **Expected Time to Completion and Time Limit.** It is expected that full-time students will complete all work for a master's/magisteriate degree within 6 terms (2 years) from the time of initial registration in the program at Concordia University. For part-time students, the expected time to completion is 9 terms (3 years). In all cases, the university academic regulations on time limits, specified under Time Limits in the Academic Regulations section of the graduate calendar, apply.
- **Graduation Requirement.** In order to graduate, students must have obtained a cumulative GPA of at least 3.00.

Courses

DART 600 Design Theory/Practice I (3 credits)
This seminar develops a framework of practice-based and theoretical approaches that build the foundation of contemporary critical design practice and study. Drawing on examples and readings from a range of disciplines, students will explore design as a product, a practice, and a mode of social communication and investigate the cultural and discursive context in which design resides. The course will integrate the three program streams, namely visual communication, the built environment, and interaction design, and address the theme of sustainability as a timely concern for design practice.

DART 601 Research Methods in Design (3 credits)
This course introduces students to a range of methodologies and strategies used to conduct research in design. Students will be exposed to the relationship that exists between research as a practice-based activity and research as theory-based inquiry and will have the opportunity to engage in the research process through studio work, writing, and presentations.

DART 610 Design Theory/Practice II (3 credits)
Prerequisite: DART 600 and DART 601.
Through a combination of studio work, seminar discussions, workshops, and individual writings, students situate their work in different contexts, such as commercial, public, or domestic environments, and explore

new venues for dissemination. Such investigations enhance students' ability to contextualize, articulate, and exhibit the thesis work.

DART 611 Interdisciplinary Practices in Design (3 credits)
Prerequisite: DART 600 and DART 601.
This seminar examines the question of how knowledge is produced and transferred through interdisciplinary design and scholarly practices. Topics include socio-cultural, environmental and economic sustainability, participatory design, collaborative methods, communities of practice, epistemic cultures, embodiment, and knowledge production. Readings will be drawn from a broad range of disciplines.

DART 620 Graduate Colloquium (3 credits)
Prerequisite: DART 610 and DART 611.
The Graduate Colloquium will foster a community of practice and research by exposing the students to a diversity of work and methods and developing understanding of disciplinary commonalities and differences. Through this colloquium series, presentations by students will be augmented with presentations by faculty, visiting researchers, and practicing designers.

DART 630 Special Topics in Sustainability (3 credits)
Topics may address a range of critical perspectives related to sustainability in terms of the environmental triad of ecological, socio-cultural and economic foci. Sustainable practice can refer to specific technical or scientific fields but also has a broader connotation towards integrative and enduring practices.

DART 631 Special Topics in Visual Communication (3 credits)
Topics may address a range of critical perspectives related to the use of signs, icons, and visual symbols to convey ideas and communicate information. This includes graphic design, typography, illustration, and photography, as well as applications in information design, wayfinding, advertising, packaging, and electronic media.

DART 632 Special Topics in the Built Environment (3 credits)
Topics may address a range of critical perspectives related to the structures, landscapes and spaces, both physical and virtual, in relation to the actions and activities that take place in them over time. This can include large-scale city planning, the design and conceptualization of living and workspaces, and the scale of object that are embedded in those spaces.

DART 633 Special Topics in Interaction Design (3 credits)
Topics may address a range of critical perspectives related to the behaviour of an object or system in relation to its users or participants. Interaction design refers to design practices that embed electronics and computing capabilities into objects, materials, and devices, and it also describes the ways in which systems and processes produce form and structure over time.

DART 690 Master's Research and Thesis (24 credits)
Prerequisite: DART 610 and DART 611.
The Master's Research and Thesis will combine a body of work or practice-led research with a written thesis document of 40-55 pages that contextualizes the practice historically and theoretically and reflects critically on the process and production. A formal oral defense and a final public exhibition of the work or practice-led research are required.

Graduate Certificate in Digital Technologies in Design Art Practice

Admission Requirements. Applicants are required to submit a description of a research project to be undertaken in the program, a portfolio and may be invited for an interview. All applicants will need an undergraduate degree, or equivalent. Applicants who do not have a Design or Art degree, may be required to take prerequisites or additional courses.

Requirements for the Graduate Certificate

The Graduate Certificate is a 15 credit program that combines an individualized research project with group seminars. Participants are expected to finish the program in the Fall/Winter semesters. In exceptional circumstances, students may substitute DART 510 for one of DART, 502, 503 or 504.

Courses

DART 500 Individual Research Project (6 credits)
Students will have the opportunity to research the application of digital design in one or two of the following areas of concentration, under the direction of a full-time faculty advisor.

- **Design for Print Media**
  Student research projects will explore aspects of digitally-generated print media. Projects can be undertaken in experimental and applied image, in graphic design, typography, font exploration and generation, packaging book works and posters.
- **Applied and Experimental 3D Object Making**
  Student research projects will involve the design of three-dimensional objects, space and environments. This design option integrates the learning of computer software for 3D modeling, rendering and animation programs, computer aided design (CAD), computer aided machining (CAM) programs for plotting, rapid prototyping for block and concept modeling and using a 3D scanner to measure existing objects for computer input.
- **Interactive Media**
  Student research projects will investigate screen-based digital design and interactive systems. These will include websites, animation, the design of virtual spaces, interactive desktop presentations and

visual navigation systems, the design and interface of virtual communities, distance learning and CD ROM based interactive educational and cultural projects, and web based national and international exchange opportunities.

- **Inter-media and Hybrid Practice**
  Student research projects will focus on digital integration or hybrid practices including social design or art interventions, installations, exhibitions, compilation works that use cross-discipline means of expression, and include the integration of digital technology into the process or final production.
- **Theoretical Investigations in Design Art**
  Student research projects will be used to investigate the theoretical constructs and discourse relating to the impact of digital technologies in art and design. This will also include the application of digital technologies for appropriate pedagogies and the development of innovative teaching methodology.

DART 502 Language, Politics, Manifestos - Reading Seminar (3 credits)
The readings in this seminar will examine the ethical responsibilities, social impact, and cultural consequences of the new technologies in design art practice. The course will identify, situate and develop a language for dialogue and discourse. The issues considered will be on design ecology and ethics, gender polarization and biases, political strategies in the public sphere, and essential declarations of the digital era, in present and future technological environments.

DART 503 Theories of Interactivity (3 credits)
This course will explore the new opportunities designers have to fundamentally change the ways in which information is organized, manipulated and disseminated in the context of new communications technologies. The computer, as a medium for expression, will be explored through issues of cognition, metaphor, narrative structures, the creation of three dimensional objects and environments, symbolic interaction, information architecture and interactive visual navigational systems.

DART 504 Contextualizing Design Practice (3 credits)
This course approaches design and digital technologies through interdisciplinary theoretical engagement to investigate the cultural and discursive context in which design resides. Through a combination of seminar discussions, workshops, and individual writings, students situate their work in different environments, such as commercial, public or domestic contexts, and explore new venues of dissemination. Such investigations enhance students' ability to contextualize, articulate and exhibit the thesis work.

DART 510 Independent Study (3 credits)
Prerequisite: Written permission of the Graduate Program Director.
Independent study proposals must be supported by a full-time faculty supervisor and approved with written permission by the Graduate Program Director. The student undertakes research in a specific field or topic relevant to their area of study.

Theatre

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Theatre Website

Note: Admissions for the Graduate Certificate in Creative Practices in Technical Production for Live Performance have been postponed to the Fall 2013.

Graduate Certificate in Creative Practices in Technical Production for Live Performance

Admission Requirements. Applicants must present evidence of advanced training or experience and will possess minimally a bachelor's degree in the performing arts or related technical field, and have a GPA of no less than 2.70.

Successful candidates should be creative, critical and collaborative thinkers, capable of adapting and applying disparate techniques towards the goal of achieving a strong artistic vision. The ideal candidates for this program should arrive with basic knowledge and practical skills from their chosen discipline. No matter the background, successful applicants are self-motivated and possess a strong desire to learn new ways to work with artists.

The program does not normally accept part-time students.

Applicants must submit a 500-word letter of intent, clearly outlining their particular area of interest, an overview of their past experience and what they wish to learn throughout the 12-month program, a curriculum vitae, and three letters of recommendation.

In addition to the normal admission process of Concordia University, all applicants are required to arrange their appointments and obtain detailed information regarding interviews and letter of intent by contacting the Program Director.

Requirements for the Certificate

- **Credits.** A fully qualified candidate is required to complete a minimum of 21 credits (18 core and 3 elective). Each candidate's program of practical study will be chosen in consultation with the Graduate Certificate Program Director.

- **Residence.** A candidate enrolled on a full-time basis will normally complete the certificate in one year.

Academic Regulations

- **GPA Requirement.** To graduate, students must have completed all program requirements with a cumulative grade point average of at least 2.70.
- **C Rule.** Students who receive more than one *C* grade during the course of their studies will be withdrawn from the program unless continuation in the program is requested by the program or the Faculty and approved by the Dean of Graduate Studies. Students may apply for readmission. Students who receive another *C* after readmission will be withdrawn from the program and will not be considered for readmission.
- **F Rule.** Students who receive a failing grade during the course of their studies will be withdrawn from the program, but may apply in writing to the Program Director for readmission. It is important to note that once the students receive another failing grade after readmission will be withdrawn from the program with no further consideration for readmission.
- **Time Limit.** It is expected that students will normally complete the certificate within one year. In accordance with university policies, however, all work for the certificate must be completed within no longer than 6 terms (2 years) from the time of initial registration in the program.

Courses

Required Courses

The program has a total of 21 credits: 18 credits of required courses, including 9 credits of practical study, and 3 credits as an elective chosen from CPTP 514, 515, 598.

CPTP 501 Connections (3 credits)
Through discussion, readings and papers, students explore ways in which designers and production personnel can participate, collaborate and contribute as full partners in the creation of live performance. Counter-intuitive links are explored in the creation of vibrant and chaotically dynamic works.

CPTP 502 The Art of Proficiency (3 credits)
This seminar focuses on describing the connection between imagination and the production-based realities associated with live performance. Through the analysis of various aspects of production, students look at ways of bridging the gap between inspiration, imagination and originality and their practical application within all aspects of production.

CPTP 503 Aspects of Visual, Aural and Performing Arts (3 credits)
This seminar helps the student develop new perspectives by dealing with the fusion between the student's present practice and other art forms. Throughout the semester, students meet various practicing artists in their work environment or as guest speakers at the university.

CPTP 511 Practical Study I (3 credits)
Under faculty supervision and based on their previous experience or areas of study, students learn how to apply a large number of creative and practical techniques from a chosen discipline towards achieving a cohesive artistic goal as dictated by current practices in the performing and related live arts. These individual projects must be selected in consultation with the program advisor and approved by the program director.

CPTP 512 Practical Study II (3 credits)
Under faculty supervision and based on their previous experience or areas of study, students expand their language and discourse in the performing arts, focusing on communication and collaboration, while marrying the philosophical and the theoretical with the practical. These individual projects must be selected in consultation with the program advisor and approved by the program director.

CPTP 513 Practical Study III (3 credits)
Under faculty supervision and based on their previous experience or areas of study, this practical study prepares the students both artistically and practically, deepening their insight into the theoretical and practical universes supporting live performance, whether within well-established and traditional artistic disciplines or within innovative and new methods of creation. These individual projects must be selected in consultation with the program advisor and approved by the program director.

CPTP 514 Practical Study IV (3 credits)
Under faculty supervision and based on their previous experience or areas of study, students work alongside professional artists either within the university or in a well-established artistic institution. Students are then given immediate 'hands on' access to various aspects of production development, construction and staging processes associated with the most current industry expectation and practice. These individual projects must be selected in consultation with the program advisor and approved by the program director.

CPTP 515 Independent Study (3 credits)
An Independent Study proposal must be supported by a full-time faculty supervisor and approved by and with written permission from the program director (in consultation with the coordinating committee). The student generates a topic to be explored from a specific field relevant to their area of study.

CPTP 598 Special Topics in Creative Practices in Technical Production (3 credits)
Topics may address a wide range of critical fields related to technical production for live performance

examining both conventional and non-traditional approaches to dance, music, theatre, as well as other performance or media arts. Subject matter will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Change in content will be indicated by the letter following the number (i.e. CPTP 598A, CPTP 598B etc.)

Business Administration

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PhD Business Administration Website

Doctor of/Doctorate in Philosophy (Business Administration)

Admission Requirements. Students will be accepted only for full-time study. To be considered for admission, applicants must have a master's degree or equivalent with high academic standing. Meritorious students enrolled in the Master of Science in Business program at the John Molson School of Business who have completed all program requirements except for the thesis may apply for permission to proceed directly to doctoral studies in the same discipline without submitting a master's thesis. These students are expected to meet the same PhD program requirements as all other students. Applicants must select their area of specialization from: Accountancy, Decision Science and Management Information Systems, Finance, Management or Marketing, at the time of application. Enrolment in the program is strictly limited and applicants are selected on the basis of past academic record, letters of recommendation and the relevance of their proposed research to the areas of specialization of the department concerned. Applicants must submit proof of satisfactory performance (600+) on the Graduate Management Admissions Test (GMAT) within the previous five years.

Test of English as a Foreign Language (TOEFL). Applicants whose first language is not English or French and who are not Canadian citizens or landed immigrants must obtain a satisfactory in the Test of English as a Foreign Language (TOEFL iBT) before being considered for admission. This requirement will be waived for foreign students completing their undergraduate degrees at a university where English or French is the language of instruction.

Concordia English Language Diagnostic Test (CELDT) *. Graduate Program Directors may require applicants to write the Concordia English Language Diagnostic Test (CELDT) as a condition of admission. Depending on the result, students may be required to complete English Language courses in addition to their program requirements.

Language Requirement. The language of instruction at Concordia University is English. However, students who also have capacity in French will be able to best profit from the joint nature of the program. In particular, the ability to read technical material and to follow lectures and discussions in both languages is an asset. Students may write reports, examinations and the thesis in English or in French as they choose.

Requirements for the Degree

- **Credits.** A fully-qualified candidate entering the program with a Master of Business Administration or a Master of Science in Administration degree is required to complete a minimum of 90 credits. Candidates admitted with a Master's degree in other disciplines will, in general, be required to complete more than the minimum number of credits. The program consists of three consecutive phases: qualification, specialization, and thesis.
    - **Phase I — Qualifying.** (The minimum number of credits to be determined upon acceptance to the program). Students without a formal academic background in business administration will be required to take up to five (5) 3-credit courses, usually at the MBA, or MSc level, from among the following disciplines: business economics, organizational behaviour, decision sciences and management information systems, marketing, finance, business policy and strategy, accountancy and control. Up to two (2) of these courses may be in the student's intended area of PhD specialization. Students may also be required to take Applied Linear Statistical Models and Multivariate Data Analysis depending on previous studies.
    - **Phase II — Specialization.** (Minimum 30 credits). In this phase, the program of study is determined by the student's Phase II supervisory committee. The **minimum** requirement of this phase is 30 credits. All students take one 3-credit compulsory course in pedagogy (ADMI 880) or approved equivalent, and one 3-credit compulsory course in Research Methodology (ADMI 870) or approved equivalent. All other seminars in the Phase II program will depend on each student's field of interest, but will generally be organized around one area of specialization. The area of specialization can be: organizational behaviour, decision sciences, management information systems, marketing, finance, business policy/strategy, and accountancy; a related interdisciplinary field (such as international business); or a significant subfield (such as consumer behaviour). Students must take a minimum of four seminars (12 credits) in their area of specialization (Phase II, elective courses), and a minimum of one additional course (3 credits) which may be in their area of specialization or in another area as determined by their supervisor, followed by a set of comprehensive examinations (ADMI 889, 6 credits). Directed Reading Courses may not be taken for credit.
    - **Phase III — Thesis.** As each student enters Phase III of the program, the School's PhD committee approves a Phase III committee. The Phase III committee supervises all stages of the thesis (60 credits) from the initial proposal through to the final defence. For details of doctoral thesis examinations, see the Thesis Regulations section.

Academic Regulations

- **Credit Load.** The normal course load for PhD students during Phase I and Phase II of the program is 9 credits in each of the fall and winter terms. In exceptional circumstances, a student in good standing may be granted permission to reduce their credit load.
- **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.
- **C Rule.** Students who receive more than one *C* during the course of their PhD studies will be withdrawn from the program. The student may appeal for reinstatement to the program director. Students who receive another *C* after reinstatement will be withdrawn from the program and will not be considered for reinstatement.
- **F Rule.** Students who fail a course are withdrawn from their program and may appeal for reinstatement. Students who fail a course after reinstatement will be withdrawn from the program and will not be considered for reinstatement.
- **Time Limit.** Students will have a maximum of three years (nine semesters) in which to complete Phase I and Phase II requirements from date of original registration in the program. Students with significant pre-requisite requirements may be granted a one semester extension. The Written and Oral Comprehensive Examinations must be completed within one semester (four months) following completion of course work.

  All work for the PhD in Business Administration must be completed before or during the calendar year, six years from the time of original registration in the program. Under exceptional circumstances the time limit may be extended upon the recommendation of the PhD Program Director and the agreement of the Dean of Graduate Studies.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of 3.00.

Courses

Phase I (Qualifying)

MSCA 602 Applied Linear Statistical Models (3 credits) *
MSCA 683 Seminar in Multivariate Data Analysis (3 credits) *

* May not be required depending on previous studies.

Phase II (Required Courses)

ADMI 870 Research Methodology in Management or approved equivalent (3 credits)
ADMI 880 Pedagogical Methods or approved equivalent (3 credits)
ADMI 889 Comprehensive Examinations (9 credits)

Phase II (Elective Courses) Minimum of 4 courses (12 credits) in the area of specialization plus 1 additional course (3 credits)

Courses offered in the following disciplines may vary in content from term to term and from year to year. Students wishing to take more than one seminar in Marketing (for example) will register in the first instance for Administration A830 and subsequently for B830, C830 etc. All seminars are 3 credits.

ADMI 800-809 Business Economics
ADMI 810-819 Organizational Behaviour
ADMI 820-829 Decision Sciences and Management Information Systems
ADMI 830-839 Marketing
ADMI 840-849 Finance
ADMI 850-859 Business Policy and Strategy
ADMI 860-869 Accountancy and Control

Phase III (Thesis)

ADMI 890 Thesis (60 credits)

Administration

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MSc Administration Website

Master of/Magisteriate in Science (Administration)

Admission Requirements. The program is open to both full-time and part-time students.

A bachelor's degree with high academic standing serves as a prerequisite for the program. To be eligible for admission, applicants must have maintained at least a *B* average in their final two years or have obtained a Grade Point Average (GPA) of at least 3.00 on a 4.30 scale, or the equivalent, from an accredited university.

Applicants with a bachelor's degree in other than Commerce or Business Administration will be required to take prerequisite courses in addition to the regular graduate program. The specific courses to be taken will be determined by the Option Advisor with the approval of the School's MSc Director depending upon the student's background and area of specialization.

Applicants must submit proof of satisfactory performance on the Graduate Management Admission Test (GMAT) or the Graduate Record Examination (GRE) within the previous five years, three letters of recommendation with the Academic Assessment forms, and a short statement of purpose. (Please note that the GMAT is preferred to the GRE).

Proficiency in English or French. Applicants whose first language is not English or French and who are not Canadian citizens or landed immigrants must obtain a satisfactory score in the Test of English as a Foreign Language (TOEFL) before being considered for admission. This requirement will be waived for foreign students completing their undergraduate degrees at a university where English or French is the language of instruction.

Concordia English Language Diagnostic Test (CELDT) *. Graduate Program Directors may require applicants to write the Concordia English Language Diagnostic Test (CELDT) as a condition of admission. Depending on the result, students may be required to complete English language courses in addition to their program requirements.

Fast-Track to PhD in Business Administration

Meritorious students enrolled in the Master of Science in Administration program at the John Molson School of Business who have completed all degree requirements except for the thesis may apply for permission to proceed directly to doctoral studies in the same discipline without submitting a master's thesis.

Requirements for the Degree

- **Residence.** In accordance with standard university policy, the minimum residence requirement for this master's degree is three terms of full-time study, or the equivalent in part-time study. This requirement must be met regardless of the amount of graduate work previously completed in any other program or at any other university.
- **Credits.** Fully-qualified candidates are required to complete a minimum of 45 credits.
    - **Seminars (24 credits).** MSCA 602 Applied Linear Statistical Models (3 credits) is required for all students in the first year of the program. Students enter one of four option; Finance, Management, Marketing or Decision Sciences and Management Information Systems, and take required and elective seminars (21 credits) as outlined below (see Options).
    - **Thesis (21 credits).** All students are required to submit a thesis.

Options

Each of the options allows students to focus on a specialized field of study and emphasizes scientific analysis and advanced-level conceptual foundations.

Finance

Candidates are required to take the following:

- 9 credits:
  MSCA 601: Financial Economics
  MSCA 602: Applied Linear Statistical Models
  MSCA 611: Research Methodology - Finance
- 15 credits of Finance option seminars (see Option Electives). These may include the following if approved by the MSc option advisor and the instructor:
  MSCA seminars in any other option
  Cognate graduate seminars offered by other departments within the university
  PhD seminar in Finance (ADMI 840-849)
- 21 credits, MSCA 699: Thesis

Management

Candidates are required to take the following:

- 6 credits:
  MSCA 602: Applied Linear Statistical Models
  MSCA 615: Research Methodology - Administrative Sciences
- 9 credits of Management option seminars (see Option Electives)
- 9 credits of elective seminars, chosen in consultation with the MSc option advisor and the instructor, from:
  MSCA 654: Seminar in Consulting
  MSCA seminars in any other option
  Cognate graduate seminars offered by other departments within the university
  PhD seminar in Management (ADMI 810-819 or ADMI 850-859)
- 21 credits, MSCA 699: Thesis

Marketing

Candidates are required to take the following:

- 6 credits:
  MSCA 602: Applied Linear Statistical Models
  MSCA 615: Research Methodology - Administrative Sciences
- 9 credits of Marketing option seminars (see Option Electives)
- 9 credits of elective seminars, chosen in consultation with the MSc option advisor and the instructor, from:
  MSCA 654: Seminar in Consulting
  MSCA seminars in any other option
  Cognate graduate seminars offered by other departments within the university
  PhD seminar in Marketing (ADMI 830-839)
- 21 credits, MSCA 699: Thesis

Decision Sciences and Management Information Systems (DS/MIS)

Candiates are required to take the following:

- 6 credits:
  MSCA 602: Applied Linear Statistical Models
  MSCA 615: Research Methodology - Administrative Sciences
- 18 credits of DS/MIS option seminars (see Option Electives) chosen in consultation with the option advisor. If approved by the MSc option advisor and the instructor, students may take some of these electives in other MSc options or in cognate graduate seminars offered by other departments within the university

- 21 credits, MSCA 699: Thesis

Option Electives

Each year a selection of specialized seminars will be offered on a rotating basis from those listed below.

Finance

MSCA 621 Seminar in Investment Theory
MSCA 622 Seminar in Investment Management
MSCA 623 Seminar in Financial Theory and Corporate Policy
MSCA 624 Seminar in Mergers, Restructuring, and Corporate Control
MSCA 625 Seminar in Options and Futures
MSCA 632 Seminar in Special Topics in Finance
Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 632A, MSCA 632B, etc.

Management

MSCA 641 Seminar in Organizational Staffing
MSCA 642 Seminar in Employee Development
MSCA 643 Seminar in Motivation, Evaluation, Compensation and Rewards
MSCA 645 Seminar in Organizational Theory and Design
MSCA 647 Seminar in Strategic Management
MSCA 652 Seminar in Special Topics in Management
MSCA 654 Seminar in Consulting
Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 652A, MSCA 652B, etc.

Marketing

MSCA 665 Seminar in Marketing Communications
MSCA 668 Seminar in Innovation and Marketing
MSCA 672 Seminar in Special Topics in Marketing
Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 672A, MSCA 672B, etc.
MSCA 673 Seminar in Segmentation and Positioning in Marketing
Note: Students who have taken MSCA 672G may not take this seminar for credit
MSCA 674 Seminar in Brand Management

Note: Students who have taken MSCA 672T may not take this seminar for credit

MSCA 675 Seminar in Research in Retailing

Note: Students who have taken MSCA 672U may not take this seminar for credit

Decision Sciences and Management Information Systems

MSCA 682 Seminar in Sampling Theory

MSCA 683 Applied Multivariate Data Analysis

Prerequisite: MSCA 602 or equivalent previously or concurrently.

MSCA 685 Enterprise Systems and Process Integration

MSCA 686 Competitive Advantage through Information Technology

MSCA 690 Data Management

MSCA 692 Intelligent Applications for Business

MSCA 693 Seminar in Special Topics in Decision Sciences and Management Information Systems

Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 693A, MSCA 693B, etc.

MSCA 694 Knowledge Management

MSCA 695 Outsourcing of Information Service

MSCA 696 Adoption, Use and Appropriation of Information Technologies

MSCA 697 Advanced Topics in Information Systems Development

MSCA 698 E-Business

MSCA 699 Research Thesis (21 credits)

The MSc thesis requirement is intended to provide candidates with an opportunity to carry out an investigation in depth in a particular area of interest and to make a contribution to knowledge in the area. It is expected that the thesis will include a comprehensive and critical synthesis of the relevant literature and will also embody either a theoretical contribution to knowledge, a rigorous empirical investigation or both.

A Thesis Committee consists of a faculty member as Supervisor and two other faculty members. An Examining Committee consists of the Thesis Committee and a Thesis Examination Chair appointed by the School's MSc Director in accordance with the thesis regulations specified in the relevant section of this calendar.

Academic Regulations

Credit Load: Full-time Students. The normal course load for full-time students is 12 credits in each of the terms in the first year and the 21 credit thesis in the second year.

Credit Load: Part-time Students. The maximum course load for part-time students is 12 credits per calendar year. The 21 credit thesis should take one year to eighteen months to complete.

Course Reduction. In exceptional circumstances, students may be granted permission to reduce their course load below the normal specified in paragraphs one and two above while remaining in good standing.

Program and Course Withdrawal. Students who wish to apply for withdrawal from the MSc program must do so in writing at the office of the Director, MSc Program. Students may drop a course up to the end of the course change period. This is normally about two weeks after classes begin (see Academic Calendar). In addition to the regulations which appear in the Graduate Registration section of the Graduate Calendar, students enrolled in the MSc program will be required to observe the following rules.

Academic Standing. The scholastic performance of all MSc students will be reviewed on a regular basis by the Departmental MSc Committee. This assessment will be based on the final grades obtained in all seminars for which students have registered subsequent to their admission into the MSc Program. To be considered in good standing at such a review, a student must maintain a cumulative grade point average (GPA) of 3.00 or better.

Conditional Standing. A student who has not fulfilled the above condition will be either a student on conditional standing or a failed student. A student on conditional standing who has not completed his or her seminar component will be required to achieve a cumulative GPA of 3.00 or better by the time of the next assessment. A student who has completed his or her seminar component and has not achieved a cumulative GPA of 3.00 will be required to repeat seminars or take up to 6 additional credits (2 seminars) to meet the 3.00 GPA graduation requirement. The seminar(s) will be determined by the Departmental MSc Committee. A student who does not satisfy the requirements of conditional standing will be considered a failed student and will be dismissed from the program.

Failure Regulation. Students who fail one seminar in the program will be dismissed from the program and may appeal for reinstatement. Students who fail a seminar and are re-admitted may either repeat the seminar or replace it by taking another seminar. Students who fail a seminar after reinstatement will be dismissed from the program and will not be considered for reinstatement. Students who fail more than one seminar will be dismissed from the program and will not be considered for re-admission.

C Rule. Students who receive more than one C during the course of their MSc in Administration studies will be dismissed from the program. The student may appeal for reinstatement to the program director. Students who receive another C after reinstatement will be dismissed from the program and will not be considered for reinstatement.

Time Limit. All work for the MSc program degree for full-time students must be completed within 12 terms (4 years) from the time of initial registration in the program at Concordia University; for part-time students the time limit is 15 terms (5 years).

Graduation Requirement. In order to graduate, students must have a cumulative GPA of 3.00.

Seminar Descriptions

MSCA 601 Financial Economics
The objective of this course is to introduce the theory of financial decision making. The fundamental issue to be addressed in finance is the allocation of scarce resources between current consumption and future consumption (investment). The interesting questions will arise when one considers the valuation of risky investment opportunities. An additional objective of the seminar is to learn how to conduct and present research.

MSCA 602 Applied Linear Statistical Models
The course focuses on systematic treatments of linear statistical models for regression, analysis of variance and experimental design with special emphasis on applications in business and economics. Topics include regression analysis: inference, model building, diagnostics, remedial measures and validation; single-factor and two-factor ANOVA models, and analysis of covariance. Other statistical tools for specialized applications discussed may include logistic regression, path analysis and time series regression. Case studies are employed to illustrate tools for fitting, checking, validating and interpreting linear models.

MSCA 611 Research Methodology - Finance
This seminar studies several approaches that are used in conducting research in finance. There are three main objectives for this seminar: a) to provide guidance and experience in the design and critique of empirical research; b) to provide an introduction to the use of financial data bases; and c) to provide experience in the conduct of an empirial research project. Specific topics addressed include: event study methodologies, time-series issues including unit root problems and time varying volatility estimation, as well as qualitative choice methods, performance appraisal tests, and simultaneous equation estimation.

MSCA 615 Research Methodology - Administrative Sciences
The objective of this seminar is to provide a basic understanding of the research process and a knowledge of the methods used in the design and execution of scientific research relevant to social sciences, and specifically the business context. The seminar helps students to develop skills needed to assess the feasibility and potential contribution of proposed studies, and to critically evaluate research reported by others. The application of relevant research methods are reviewed through discussions of exemplary articles published in leading journals. Cornerstone topics in this seminar include: theory construction, measurement,

overview of data collection methods, reliability, as well as internal and external validity issues.
Note: Students who have taken MSCA 612, MSCA 613 or MSCA 614 may not take this seminar for credit.

MSCA 632 Seminar in Special Topics in Finance
Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 632A, MSCA 632B, etc.

MSCA 652 Seminar in Special Topics in Management
Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 652A, MSCA 652B, etc.

MSCA 654 Seminar in Consulting
This seminar is designed to better understand the management consulting profession and process. The main topics covered in this seminar include the consulting process, core consulting skills, the consulting industry and key players, the role of internal consultants, management consulting as a career. The seminar includes a small consulting assignment that students conduct in teams with a client firm in order to apply in practice the tools and skills discussed in class.

MSCA 668 Seminar in Innovation and Marketing

MSCA 672 Seminar in Special Topics in Marketing
Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 672A, MSCA 672B, etc.

MSCA 673 Seminar in Segmentation and Positioning in Marketing
Note: Students who have taken MSCA 672G may not take this seminar for credit.

MSCA 674 Seminar in Brand Management
Note: Students who have taken MSCA 672T may not take this seminar for credit.

MSCA 675 Seminar in Research in Retailing
Note: Students who have taken MSCA 672U may not take this seminar for credit.

MSCA 693 Seminar in Special Topics in Decision Sciences and Management Information Systems
Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 693A, MSCA 693B, etc.

MBA

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MBA Website

Master of/Magisteriate in Business Administration

Admission Requirements. Applicants for the John Molson MBA must have obtained a bachelor's degree in high standing, or qualifications accepted as equivalent by the School of Graduate Studies, and a minimum of two years full-time work experience. Applicants considered for the accelerated MBA must have obtained an undergraduate business degree within the last six years with a cumulative grade point average (CGPA) of 3.30. Applicants to the above programs are evaluated according to the following five criteria: undergraduate grades; Graduate Management Admission Test (GMAT) score; work experience; detailed evaluations from employers and former university instructors; and a letter of intent.

Proficiency in English or French. Applicants whose first language is not English or French, and who are not Canadian citizens or landed immigrants, must achieve a satisfactory performance in the Test of English as a Foreign Language (TOEFL) before being considered for admission. This requirement will be waived for foreign students who have completed their undergraduate degrees at a university where English or French is the language of instruction.

Requirements for the Degree

- **Credits.** To earn an MBA degree from Concordia University, a student in the regular MBA program must normally complete 57 credits and a student in the accelerated MBA program 45 credits, in addition to any required qualifying courses. This requirement will be reduced only in cases where transfer credits are granted.
- **Residence Requirement.** The residence requirement for the regular MBA is normally four terms of full-time study, or the equivalent in part-time study. This requirement may be reduced to three terms of full-time study or the equivalent in part-time study for students admitted with transfer credits. The residence requirement for the accelerated MBA is normally three terms of full-time study, or the equivalent in part-time study.
- **Course Substitution.** Students may be exempted from certain courses on the basis of course work completed prior to entry into the program. However, such courses must be replaced by other MBA courses, or, subject to approval, by MSc (Administration) courses or graduate courses taken outside

the John Molson School of Business. While students admitted with course substitutions are not required to take all of the courses specified in the program, every student must meet the degree requirement of 57 credits. Details of policies and practices related to course substitution may be obtained from the Assistant Director, MBA Program.

- **MBA Option for Diploma in Chartered Accountancy Students.** Students in good academic standing who meet the admission requirements of the MBA Program, and who have completed the requirements for the Diploma in Chartered Accountancy Program, may be granted advanced standing for up to 30 credits upon admission to the MBA Program. Students having completed the course work in the Diploma in Chartered Accountancy Program and having been admitted to the MBA Program will be required to take the following courses:

  MBA 606 Managerial Economics
  MBA 609 Organizational Behaviour
  MBA 610 Marketing Management
  MBA 618 National and International Economics
  MBA 622 Business Policy and Strategy
  MBA 625 Managing Strategic Action
  MBA 691 Business Ethics
  + 2 electives

  Note: Students who have had their Diploma conferred will not receive transfer credits to the MBA Program. Course exemptions may be granted, but they must be replaced by alternative courses.

- **MBA Option for Graduate Certificate in Management Accounting Students.** Advanced Standing for the MBA Program. Students in good academic standing who meet the admission requirements of the MBA Program, and who have completed the requirements for the Graduate Certificate in Management Accounting Program, may be granted advanced standing for up to 21 credits upon admission to the MBA Program.

  Students who have completed the course work in the Graduate Certificate in Management Accounting Program will be required to complete the following courses (total 36 credits):

  MBA 606 Managerial Economics
  MBA 608 Managerial Statistics
  MBA 609 Organizational Behaviour
  MBA 610 Marketing Management
  MBA 616 Operations Management
  MBA 618 National and International Economics
  MBA 622 Business Policy and Strategy

MBA 625 Managing Strategic Action
MBA 691 Business Ethics
+ 3 electives

Note: Students who have had their Certificate conferred will not receive transfer credits to the MBA Program. Course exemptions may be granted, but they must be replaced by alternative courses.

Academic Regulations

- **Course Load for Full-time Students.** The course load for a full-time student is a minimum of 12 credits of course work per term. Students can accelerate their progress by taking courses in the Summer term.
- **Course Load for Part-time Students.** The normal course load for a part-time student is a minimum of 12 credits per calendar year. A part-time student may not, without permission, register for more than 6 credits in each of the Fall and Winter terms, but may accelerate their progress in the program by taking courses in the Summer term.
- **Change of Status.** Students may be granted permission to change their status from part-time to full-time or vice-versa. If a change is permitted, the student's program time limit will be adjusted accordingly.**Course Load Reduction.** In exceptional circumstances, students may be granted permission to reduce their course load below the normal specified in paragraphs 1 and 2 above, while remaining in good standing. Full-time students completing less than 9 credits per term will be reclassified as part-time, and must comply with the course load requirements for part-time students, specified in paragraph 2 above.
- Part-time students with a reduced course load must complete a minimum of 9 credits per year, including the Summer term. Full- and part-time students who have been granted such permission will be subject to specific conditions, as outlined in the section on Academic Standing.
- **Program and Course Withdrawal.** Students who wish to apply for withdrawal from the MBA program must do so in writing at the MBA Program office. Students may drop a course up to the end of the course change period. (This is normally about two weeks after classes begin – see Academic Calendar.) Application to drop a course must be made in writing at the MBA Program office. Students should bear in mind the minimum and maximum course load regulations specified above, when dropping or adding courses.
- **Academic Standing.** The scholastic performance of all MBA students is reviewed at the end of each term for full-time students. Part-time students are reviewed annually. This assessment is based on the final grades of the courses completed during the term. The purpose of the review is to monitor the students' status and progress, to maintain the standards expected by the John Molson School of Business, and to assist students in achieving success in the Program.

  To be considered in good standing at such a review, a student must have:

- Successfully completed the required course load specified in paragraphs 1 and 2 above; and
- Achieved a grade point average (GPA) of 3.00 or better, since the previous review or since admission, in the case of the final review; or
- Achieved a grade of *B* or better in each course taken during any term in which a course load reduction has been granted, as specified in paragraph 4 above. **Conditional and Failed Standing.** Students who have not met the conditions for good standing specified in Paragraph 6 will be considered as either *students on conditional standing* or *failed students*.

- Conditional standing is used to monitor the progress of students experiencing difficulty and to assist them in completing the Program successfully. Students on conditional standing will be required to achieve a minimum GPA of 3.00 during their period of conditional standing. Students on conditional standing are not normally permitted to drop any course. Additional requirements may be imposed in individual cases. Students who do not meet the requirements of their conditional standing are considered as *failed students* and are withdrawn from the Program.
- **Failure Regulation.** Students who fail one or more courses in the Program or do not meet the conditions of their conditional standing are withdrawn from the Program.
- **Business Communication Skills.** All students in the MBA Program must demonstrate a high level of competence in written and oral communications. A strong managerial communications component has been designed into a number of MBA courses to help students evaluate and develop their skills in this area. Students who exhibit deficiencies in communication skills will be expected to obtain appropriate assistance through designated courses, workshops or individual tutorial support.
- **Cognate Courses.** Subject to the approval of the MBA Program Director and the departments concerned, MBA students are permitted to choose courses from those offered by other programs within the John Molson School of Business or from courses offered by other Faculties. A maximum of 12 credits can be selected from courses outside the John Molson School of Business.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of 3.00 or better.

Program Structure

Qualifying Courses

Normally, students who require qualifying courses will have to complete them prior to beginning their program of study.

COMM 610 Basic Quantitative Skills for Administration (3 credits)
The objectives of this course are to review the algebra, calculus, probability, and statistics that students may require in courses with quantitative content. Applications to management and economics will be

discussed.
Note: Students who have taken COMM 500 or COMM 600 may not receive credit for this course.

Courses in the John Molson MBA Program

After successfully completing the qualifying course (if necessary), students in the regular MBA will complete a 57-credit program, and students in the accelerated MBA will complete a 45-credit program comprising the core courses and one of three elective options. Full-time students in the regular MBA will normally complete the program within sixteen months to two years of their first registration and full-time students in the accelerated MBA will normally complete the program within one year.

The first part of the program is made up of core courses that are mandatory for all regular MBA students. Students in the accelerated MBA program are required to complete nine of these courses including MBA 625 and MBA 691. The required courses are chosen in consultation with the MBA Program Director, based on the student's academic background.

All students may be permitted to substitute other graduate-level courses, as described under Course Substitution: MBA option for Diploma in Chartered Accountancy students and MBA option for Graduate Certificate in Management Accounting students. The purpose of these core courses is to provide an integrated and rigorous body of functionally oriented skills and knowledge as a foundation for the second part of the program, when students can choose one of three options.

Part I - Core Courses

Regular MBA 39 credits
Accelerated MBA 27 credits

MBA 606 Managerial Economics (3 credits)
This course provides the theory and the practical techniques for economic decision-making by business firms and other institutions. Topics covered include demand theory, cost theory and estimation, and pricing theory and practice. These issues are discussed within a firm-theoretic framework and business applications of the theory are emphasized.

MBA 607 Financial Accounting for Managerial Decisions (3 credits)
This course provides an overview of the corporate external financial reporting system and of the managerial objectives of corporate financial statements. The roles of management, government and auditors are examined. The specific information needs of the principal users are reviewed. The process for developing and enforcing generally accepted accounting principles (GAAP) and reporting standards, both legal and professional, is examined. At the outset, this includes a review of the financial accounting model that

underlies traditional corporate financial statements. However, emphasis is placed on examining selected major GAAPs and comparing them to actual corporate reporting practices.

MBA 608 Managerial Statistics (3 credits)
This course focuses on the applications of statistical techniques that are essential in business data analysis and decision-making. Topics include descriptive statistics, probability and probability distributions, inferences about means, proportions and variances, tests of goodness-of-fit and independence, analysis of variance and linear regression analysis. Statistical software packages are used to perform analyses of data sets and present findings.

MBA 609 Organizational Behaviour (3 credits)
Organizational behaviour (OB) is a field of study that investigates the impact that individuals, groups, and structure have on behaviour within an organization, and then applies that knowledge to improve an organization's effectiveness using social and behavioural principles. Because OB is concerned with employment-related situations, it emphasizes behaviour and the job, absenteeism, employee turnover, productivity, human performance and management. Particular emphasis is placed on identifying and diagnosing the causes and consequences of effective and ineffective behaviour in organizations. Topics covered include perception, work attitudes, motivation, leadership, some aspects of decision-making, and group dynamics including intra- and inter-group processes. The management of change is covered as well, using a mixture of discussion, case analyses and experiential exercises.

MBA 610 Marketing Management (3 credits)
This course focuses generally on the strategic role of marketing for any firm. The primary objective is the cultivation of marketing management skills and perspectives. All aspects of the marketing management process are covered. Particular attention is directed to the analysis of marketing opportunities, the researching and selection of target markets, the designing of marketing strategies, the planning of marketing programs, and the organizing, implementing and controlling of marketing effort. A blend of lectures, cases, readings and papers are used to achieve the course objectives.

MBA 614 Financial Management (3 credits)
Prerequisite: MBA 607; *Co-requisite:* MBA 608.
This foundation course provides a framework for making corporate investment, financing and risk management decisions. With the underlying objective of maximizing firm value, this course examines practical decisions confronting financial managers in large and small enterprises by drawing on core concepts and empirical evidence that support best practices. Specific topics explored in depth include security and option valuation, capital budgeting, asset pricing, capital structure and dividend policy decisions. Other topics such as working capital management, takeover and leasing may also be discussed.

MBA 615 Management Information Systems (3 credits)
Management information systems (MIS) deals with the coordination and use of three very important organizational resources: information, information technology, and people. This course introduces MIS core concepts and principles and elaborates on the role of the MIS department and the organization. Practical solutions and theoretical models are used to illustrate common MIS issues in organizations, and to apply knowledge acquired through readings and lectures.

MBA 616 Operations Management (3 credits)
Co-requisite: MBA 608.
This course concentrates on the quantitative and qualitative techniques used in business to achieve efficient and effective utilization of scarce resources. Management and control of labour, machinery, material, money, planning, information and time resources in manufacturing and the service sectors are studied. Among the topics covered are linear programming, aggregate planning, scheduling, materials management, quality control and project management. The interactions with other functional areas, such as information systems, marketing, accounting and finance, are illustrated through case studies. Recent developments in the area are introduced within the context of manufacturing and service strategies. Modelling and implementation aspects of operations management are emphasized throughout the course. A computer package is used as an aid for the solution phase of the operations management problem-solving process.

MBA 618 National and International Economics (3 credits)
This course explores the causes of economic growth and decline in firms and in industries, with special emphasis on international factors. Topics discussed include the constituent parts of national output, inflation and unemployment, and money and interest rates. Coverage also includes foreign exchange rate determination, balance of payments issues and the theory of international trade.

MBA 622 Business Policy and Strategy (3 credits)
Prerequisites: MBA 606, MBA 609, MBA 610 and MBA 614.
This course integrates the core functional disciplines of business within a strategic perspective. The course introduces several strategic management concepts including industry analysis and dynamics, the organizational resource audit, strategic typologies, the role of the general manager and the management of strategic transformations. The principle goal is to develop and enhance student ability in problem identification, environmental and organizational analyses, strategic alternative formulation, and action implementation. The pedagogy of the course is based upon comprehensive case studies that deal with strategic issues, in a variety of contemporary business contexts.

MBA 625 Managing Strategic Action (3 credits)
Prerequisite: MBA 622.
This course explores the process by which strategic intent and strategy are linked to managerial action. The course centers in on both the development of strategic action in response to issues emanating in the broader

external environment as well as issues concerned with the implementation of action programs in contemporary organizations. Specific topics concerned with the external environment include managing social responsibility, ethical dilemmas, economic and social regulations and technological change. Using major organizational theory concepts as a framework, the course also examines how strategic intent can be linked to organizational structure, performance evaluation and management systems. A principal objective of the course is to enhance the student's ability to make decisions through case studies, student presentations, and lectures.

MBA 628 Management Accounting (3 credits)
Prerequisite: MBA 607.
This course focuses on the use of accounting data and the analytical techniques required to provide information for internal decision-making in organizations. The main topics in the course are the nature and behaviour of costs, types of costing systems, short-run and long-run decision-making, budgeting, responsibility accounting, and control systems.

MBA 691 Business Ethics (3 credits)
Co-requisite: MBA 622.
This course exposes students to ethical theory and its practical application in the business environment. By utilizing the stakeholder model, the strategic management process is expanded to include ethical elements as means for evaluating business decisions. Through case analysis, group discussions, in-class debates and presentations, students learn to apply theoretical and practical ideas to real life business situations.

Part II - Electives

Option A:

Course Work	18 credits
6 elective courses	

Option B:

Research Paper	12 credits
4 elective courses	6 credits
MBA 631: MBA Research Paper	
	18 credits

MBA 631 MBA Research Paper (6 credits)
The objective of the research paper is to provide each student with an opportunity to carry out an in-depth investigation of a selected business problem, working on a one-to-one basis with a faculty member. Research papers may concentrate on a specialized area or they may be interdisciplinary in scope. The investigation will normally extend over two terms.

Option C:

Practicum	15 credits
5 elective courses	3 credits
MBA 632: MBA Practicum Project	
	18 credits

MBA 632 MBA Practicum Project (3 credits)
Although this course is not limited to full-time students, part-time students wishing to be considered must be available during the day throughout the Fall term to attend the necessary course lectures and carry out field work assignments. The objective of the Practicum Project is to provide students with an opportunity to carry out an in-depth investigation of a complex business problem within a corporation or other economic entity. The Project is intended to enhance students' diagnostic skills, improve their ability to develop innovative and practical responses to complex interdisciplinary problems or entrepreneurial opportunities, sharpen their abilities in working effectively with executives and other group members and hone their communication skills. Students work together in small groups, within the framework of a course that extends over two terms. The course includes lectures and readings on relevant consulting skills, as well as presentations and discussions with executives and with other participants in the course. The number of sections offered in a given year will be limited.

Elective Courses

Some of these courses may not be available in a given academic year. Special Topics courses are offered by most departments. Detailed information as to availability and content may be obtained from the MBA Program Office.

List of Elective Courses

In addition to the elective courses listed below, MBA students may also take courses in the MSc in Administration Program, or graduate courses offered outside the John Molson School of Business, subject to approval by the MBA Program Director.

MBA 627 Seminar in International Business
MBA 695 Seminar in Special Topics (*)

Accountancy

ACCO 661 Seminar in Financial Accounting
ACCO 671 Seminar in Managerial Accounting
ACCO 691 Seminar in Business Valuations
ACCO 695 Seminar in Special Topics (*)

Decision Sciences and Management Information Systems

DESC 660 Project Management
DESC 661 Seminar in Decision Support Systems in Business
DESC 663 Seminar in Corporate Information Systems Management
DESC 664 Negotiation and e-Negotiation Management and Support
DESC 677 Business Forecasting
DESC 695 Seminar in Special Topics (*)

Finance

FINA 651 Seminar in Financial Intermediaries
FINA 663 Seminar in Corporate Finance
FINA 680 Seminar in Short-Term Financial Management
FINA 682 Seminar in International Financial Management
FINA 683 Seminar in Portfolio Management
FINA 685 Seminar in Options and Futures
FINA 687 Seminar in Derivatives and Risk Management
FINA 690 Seminar in Investments
FINA 691 Seminar in Real Estate Finance
FINA 695 Seminar in Special Topics (*)

Management

MANA 661 Seminar in Production Management
MANA 663 Seminar in Labour Relations

MANA 664 Seminar in Corporate Law
MANA 681 Seminar in the Management of International Business
MANA 682 Seminar in Human Resources Management
MANA 683 Seminar in Entrepreneurship and Small Business
MANA 691 Seminar in Strategies in Action: Case Competition
MANA 692 Seminar in Commercial Contract Law
MANA 695 Seminar in Special Topics (*)

Marketing

MARK 661 Seminar in Distribution Systems
MARK 664 Seminar in Advertising Management
MARK 671 Seminar in Consumer Behaviour
MARK 672 Seminar in Strategic Marketing
MARK 681 Seminar in International Marketing
MARK 683 Seminar in International Transportation and Distribution
MARK 691 Seminar in Pharmaceutical Marketing
MARK 695 Seminar in Special Topics (*)

(*) Subject matter will vary from term to term and students may take more than one of these courses, provided that course content has changed. In such cases, the student's record will be automatically modified to 696, 697, etc. to reflect this change in content.

MBA Co-operative Option

The MBA Co-operative Option is non-credit and is offered to all students who are enrolled in the John Molson MBA Program. Students accepted into the Co-op must be registered as full-time, have completed 24 credits, and maintain a cumulative GPA of 3.30 or better.

Students may do a minimum of one work term (four months) to a maximum of three work terms (twelve months). Students must return to full-time study for their last term.

MBA (Executive Option)

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Executive MBA Website

Master of/Magisteriate in Business Administration (Executive Option)

Admission Requirements. New students are admitted into the Executive MBA Program provided they satisfy the following prerequisites:

- A minimum of 5 years of relevant professional, managerial or entrepreneurial work experience;
- Support commitment by employer;
- A bachelor/baccalaureate degree or equivalent qualifications. Applications from candidates with extensive work experience without a bachelor/baccalaureate degree may be considered;
- A satisfactory result on the Graduate Management Admissions Test (GMAT). However, this requirement may be waived for candidates with strong academic credentials;
- A minimum of two letters of reference from work-related or academic sources;
- Statement of purpose;
- Successful interview with the Admission Committee.

Intensive workshops in Mathematics and Accountancy are offered prior to the start of the Program to registered students who would need to refresh their competence in business mathematics.

Academic Regulations

- **Transfer credits.** Because of the integral structure of the EMBA Program, neither transfer credits nor course exemptions will be granted.
- **Attendance.** Students are expected to attend all classes. An occasional absence will be permitted, but beyond that a student will be warned and then placed on probationary standing.
- **GPA Requirement.** The academic performance of each EMBA student will be reviewed by the EMBA committee at the end of each term. To be considered in good standing at this review, the student must, in the preceding term, have:
    - successfully completed the required course load;
    - achieved a grade point average of 3.00 or better.

- **F Rule.** Students who have not fulfilled these conditions will, at the discretion of the EMBA committee, be considered either a student on probationary standing or a failed student. Students who have failed a course will normally be considered a failed student. Students on probationary standing will have specific requirements set as a condition of being returned to good standing. If these requirements are not met, the student will be considered a failed student. Failed students will be withdrawn from the program.

  Students who have not fulfilled the requirements for good standing in their final review have not fulfilled the degree requirements. In such cases, the requirements which they must meet in order to be reinstated as students in good standing, and thus, to be considered for graduation, will be determined by the EMBA committee.

- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of 3.00.

Requirements for the Degree

Credits. A fully-qualified candidate is required to complete a minimum of 54 credits. Students must also participate in a required international study trip.

Required Courses

EMBA 600 Management Skills Seminar (1.5 credits)
Offered during orientation week, this seminar focuses on managerial and interpersonal skills that are critical for the development of managerial effectiveness. During the seminar participants will be exposed to recent thinking on team building, communication theory, conflict management and negotiating. Theory will be complemented by applications in specific organizational contexts and experiential exercises.

EMBA 601 Leadership Seminar (1.5 credits)
This seminar which takes place at an off site retreat serves as a capstone course for the program. It allows participants to reflect on their Executive MBA experience, and it provides an opportunity for them to assess how they have integrated the material which has been studied during the program. Particular emphasis is placed on the leadership skills required to be the leader of an organization. Cases and other exercises are used so that participants can evaluate their own leadership skills and where they are at with respect to their own career objectives.

EMBA 661 Domestic and International Economics (3 credits)
This course develops the economic foundations of managerial decisions. Topics include the pricing decision under various market structures – monopoly, oligopoly and competition, an introduction to macro-economics

and government, international economic and financial systems, trade theory, governmental international economic policies and the theory of exchange rates are discussed.

EMBA 662 Principles of Accounting (3 credits)
This course introduces the theory and practice of corporate accounting and reporting systems for external users. Emphasis is placed on the importance of accounting information for decision makers.

EMBA 663 Business Statistics (3 credits)
This course introduces the principles of statistics, probability and sampling theories. Estimation and hypothesis testing are introduced followed by an introduction to multiple regression and time series analysis. Students are also introduced to quantitative business research methodology.

EMBA 664 Organizational Behaviour (3 credits)
The organizational behaviour aspect of this course focuses on individual and group levels of behaviour. This course also focuses on interactions of behavioural phenomena among these levels. Concepts such as motivation, leadership and group behaviour will be thoroughly discussed, and their relevance to organizational behaviour will be examined. The organizational development aspect concerns facilitating and managing change in organizations. Students will acquire an understanding of change processes, considerable knowledge and some skills about organizational diagnosis, action planning and constancy.

EMBA 671 Financial Management (3 credits)
This course provides the foundations for the management of an organization's financial resources. It begins with a discussion of the time value of money, theories of interest rates, risk-return relationships and asset pricing in competitive markets, and then introduces the principles of capital budgeting, financing decisions of firms, and financial derivatives. It focuses on two of the major entrepreneurial decision making challenges, initial public offerings and the practical aspects of mergers and acquisitions.

EMBA 672 Strategy and Competition (1.5 credits)
This course is designed to develop a general management perspective within the context of current strategic management concepts and techniques. The concept of strategy is the central theme of this course, which assists in the integration of materials covered in other courses of the EMBA program. This course focuses on strategic analysis, including the assessment and the formulation side of the strategy process. The specific objectives of the course are (1) to develop an understanding of the literature and key concepts of contemporary strategic management, and the strategy formulation process, (2) to develop an analytical approach to the study of a firm, its strategy and its industry, (3) to support the development of effective strategy analysis skills.

EMBA 673 Marketing Management (3 credits)
This course examines the nature of marketing and the interrelationships that are operative within the

marketing process both externally as related to society and the marketplace, and internally as related to the organization and planning function of the firm. Particular attention is directed at understanding and appreciating basic marketing concepts and the behavioural aspects of marketing, as well as to their application in analyzing marketing opportunities, researching and selecting target markets, and designing marketing programs. It deals with entry strategies for new markets, both domestic and international, market positioning, strategic direction, strategic planning and selecting a financing approach. Lastly, the course examines how marketing policies for domestic as well as international markets are developed.

EMBA 675 Operations Management (3 credits)
Approaches and techniques for allocating scarce resources in manufacturing and service industries are presented. Among the topics covered are forecasting, aggregate planning, materials management, scheduling, quality management, waiting lines and project management. Strategic issues are discussed within the context of supply chain management. Interactions with other business areas are emphasized through cases.

EMBA 676 International Study Trip (1.5 credits)
Participants will visit one or more countries to meet with managers, government officials, and academics to understand the business environment of those countries as well as to carry out a team project in those countries.

EMBA 677 International Business I: The Environment of World Business (1.5 credits)
This course focuses on two aspects of managing in an international business environment. Participants explore the idea of culture, how culture has an impact in relationships between people in managerial situations, how we can understand culture and finally, how we can manage effectively in cross cultural situations. In addition, the course focuses on managing international expansion of business through trade and investment and the role of governments' trade and investment policies in the development of international markets.

EMBA 681 Corporate Finance (3 credits)
This course first focuses on the principles of investments, raising funds in domestic and international markets, and hedging financial risks (interest exchange rates) in markets and then introduces students to complex financial issues like corporate reorganization, including acquisitions.

EMBA 682 Managerial Accounting (3 credits)
This course considers the development and use of external financial accounting as well as internal cost accounting information for managerial analysis and decision making. Entrepreneurial accounting addresses major challenges facing management (1) buying, selling and merging companies, (2) locating and maintaining appropriate sources of funding, (3) using funds wisely.

EMBA 685 Managing Information Technology (3 credits)
Prepares students to play leading roles in the management of IT. Introduces students to the issues and challenges faced by managers in the deployment of information systems and information technology in a corporate environment. On completing this course students should be more familiar with issues related to managing telecommunications and distributed systems, information systems planning, development and implementation, database management, decision support systems, information technology outsourcing, knowledge management systems, implementation of e-business systems and risk, controls and security measures.

EMBA 687 Human Resource Management (3 credits)
This course addresses such issues as organizational structure and design, organizational change, and organizational development. It deals with human resource management, including strategy and planning. It looks also at such topics as recruitment, selection, and international assignments. This course concludes by examining several topical aspects of industrial relations. It deals with three main issues regarding negotiations. First, negotiation and what it involves. Second, skills people need to carry out negotiations. Third, the feelings, values and beliefs people have about proper conduct in negotiations and how the actions of others in negotiation clash or appear to clash with them.

EMBA 690 Management Consulting Project (3 credits)
The purpose of this course is to have students develop an independent consulting project dealing with an issue that an organization has selected for attention. Students working in assigned groups will be responsible for determining the scope of the project following consultations with the professor supervising this course. It is anticipated that many students will select their own organizations as the target organization for this project. The project is intended to enhance students' diagnostic skills and their ability to develop innovative and practical responses to complex disciplinary problems. The results of the consulting project will be presented to the EMBA class and a report will be submitted to the supervising professor.

EMBA 693a Technology Management (1.5 credits)
This seminar which is designed as a general management course examines a number of issues concerning the development and management of technology. In particular, the course will look at the challenges of managing breakthrough innovations and technology issues affecting firms operating in advanced technology markets. It also examines the specific needs and unique operating characteristics of successful advanced technology firms.

EMBA 693b e-Business (1.5 credits)
This course is designed to examine the fundamental managerial issues in e-business at both the strategic and operational levels. Topics covered will include areas such as: e-business strategies and models; the role of electronic commerce technologies; intelligent systems, customer relationship management, virtual enterprises and security and ethical issues in e-business.

EMBA 694 Managing Strategic Action (1.5 credits)
This course explores the process by which strategic intent and strategy are linked to managerial action. The course focuses on both the development of strategic action in response to issues emanating in the broader external environment as well as issues concerned with the implementation of action programs in contemporary organizations.

EMBA 697 International Business II: Managing in a Global Economy (1.5 credits)
This second course in international business focuses on issues that managers face in managing their businesses in an international environment. Participants are exposed to key aspects of international financial management, international marketing, international law and the management of multinational enterprises.

EMBA 698a Entrepreneurship and Small Family Business (1.5 credits)
The objective of this course is to introduce students to the theory and practice of entrepreneurship, family business and small business management. Students can expect to concurrently evaluate data and/or decisions in several areas of entrepreneurship and small business and to apply sound, relevant theoretical concepts to the problems and issues that develop.

EMBA 698b Governance (1.5 credits)
This course will familiarize students with the main issues in Corporate Governance and provides a multi-disciplinary framework to analyze those issues. It looks at the relationship among stakeholders to determine and control the strategic direction and performance of organizations. Emphasis is place on shareholders, management, and boards of directors. The course attempts to bring together the different approaches to governance used in finance, economics, organizational behaviour and law.

EMBA 699 Contemporary Issues in Business (1.5 credits)
The purpose of this course is to allow flexibility in the Executive MBA offerings and to provide a forum for the discussion of current issues in business. The specific topic of this course will be determined before the start of the second year of the program following consultations with members of the EMBA class.

Note: Students entering the EMBA Program prior to 2004 are required to fulfill the degree requirements as stipulated in the 2003-2004 Graduate Calendar.

Investment Management Programs

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JMSB Website

Goodman Institute of Investment Management

Diploma in Investment Management (DIM)
Master of/Magisteriate in Investment Management (MIM)
Master of/Magisteriate in Business Administration (Investment Management Option) (GIIM)

Admission Requirements. The Admissions committee will evaluate the potential of each candidate for success within the program. A bachelor's degree, with high academic standing, or qualifications accepted as equivalent by the School of Graduate Studies and acceptance into the CFA® program are necessary for admission. The applicants are evaluated according to the following criteria: undergraduate performance, Graduate Management Admission Test (GMAT) scores, work experience, detailed evaluations from employers and former university instructors, and statements of self-assessment. Students without formal undergraduate training in quantitative methods, accounting, economics, and finance will be required to demonstrate adequate preparation.

Note: GMAT requirements for GIIM applicants who have already passed CFA Level I examinations will be waived.

Proficiency in English or French. Applicants whose first language is not English or French, and who are not Canadian citizens or landed immigrants, must achieve a satisfactory performance (TOEFL iBT: 90 or equivalent) in the Test of English as a Foreign Language (TOEFL) before being considered for admission. This requirement will be waived for international students who have completed their undergraduate degrees at a university where English or French is the language of instruction.

Academic Regulations

- **GPA Requirement.** The academic standing of each student will be reviewed by the committee at the end of each term. To be considered in good standing at this review, the student must, in the preceding term, have:

    - Successfully completed the required course load with a grade point average of 3.00 or better for MIM and GIIM MBA students only; or 2.70 for DIM students.
    - MIM and GIIM MBA students must pass the appropriate CFA® examinations. DIM students are not required to pass any of the CFA® examinations.
- **Academic Standing.** Students who have not fulfilled these conditions will, at the discretion of the program committee, be considered either as students on probationary standing or as failed students. Students who have failed a course, or the appropriate CFA® exam, will normally be considered failed students. Students on probationary standing will have specific requirements set as a condition of being returned to good standing. If these requirements are not met, the student will be considered as failed. Failed students will be withdrawn from the program and can apply for reinstatement.
- **Graduation Requirement.** In order to graduate, students in the MIM and GIIM MBA programs must have a cumulative GPA of 3.00 and must successfully complete Level I of the CFA® examinations. DIM students must have a cumulative GPA of 2.70 and are not required to complete the CFA® examinations.

Diploma in Investment Management

Requirements for the Diploma and Program Procedures

- To earn the Graduate Diploma in Investment Management degree from Concordia University, the student must successfully complete 33 credits and must have a minimum cumulative GPA of 2.70.
- **Course Load.** Normally students must register for a total of 33 credits over 2 years, and must achieve success in these courses in order to remain a student in good standing in the program. Students are expected to complete the Diploma in no more than four years from the year of initial registration in the program.

Transfer Credits

Students who have had their Diploma in Investment Management conferred will not receive transfer credits for the MIM or GIIM MBA Programs.

Required Courses for the Diploma in Investment Management (33 credits)

GIIM 610 Economics
GIIM 611 Financial Statement Analysis I
GIIM 613 Asset Pricing and Portfolio Management I
GIIM 614 Security Valuation in the Domestic and International Environment
GIIM 616 Quantitative Techniques
GIIM 617 Corporate Finance

GIIM 618 Seminar in Corporate Finance
GIIM 620 Financial Statement Analysis II
GIIM 621 Fixed Income Analysis
GIIM 622 Derivatives
GIIM 623 Asset Pricing and Portfolio Management II
GIIM 624 Analysis of Equity Investments
GIIM 633 Investment Law and Ethics

Master of/Magisteriate in Investment Management

Requirements for the Degree and Program Procedures

To earn the Master in Investment Management degree from Concordia University, the student must successfully complete 45 credits and pass Level I of the CFA® exams. Students are expected to complete the degree in no more than five years from the year of initial registration in the program.

Required Courses for the Master of/Magisteriate in Investment Management (45 credits)

GIIM 610 Economics
GIIM 611 Financial Statement Analysis I
GIIM 613 Asset Pricing and Portfolio Management I
GIIM 614 Security Valuation in the Domestic and International Environment
GIIM 615 CFA® Exam Preparation Course Level I
GIIM 616 Quantitative Techniques
GIIM 617 Corporate Finance
GIIM 618 Seminar in Corporate Finance
GIIM 620 Financial Statement Analysis II
GIIM 621 Fixed Income Analysis
GIIM 622 Derivatives
GIIM 623 Asset Pricing and Portfolio Management II
GIIM 624 Analysis of Equity Investments
GIIM 631 Asset Allocation and Performance Measurement
GIIM 633 Investment Law and Ethics
GIIM 636 Alternative Investments
GIIM 653 Seminar in Investment Analysis and Management
GIIM 654 Seminar in International Investment Analysis and Management

Non-credit Electives

GIIM 625 CFA® Exam Preparation Course Level II
GIIM 634 CFA® Exam Preparation Course Level III

Master of/Magisteriate in Business Administration (Investment Management Option)

Requirements for the Degree and Program Procedures

To earn the Master of Business Administration (Investment Management option) degree from Concordia University, the student must successfully complete 57 credits and must pass Level I of the CFA® exams. Students are expected to complete the degree in no more than five years from the year of initial registration in the program.

Required Courses for the Master of/Magisteriate in Business Administration (Investment Management Option) (57 credits)

GIIM 610 Economics
GIIM 611 Financial Statement Analysis I
GIIM 613 Asset Pricing and Portfolio Management I
GIIM 614 Security Valuation in the Domestic and International Environment
GIIM 615 CFA® Exam Preparation Course Level I
GIIM 616 Quantitative Techniques
GIIM 617 Corporate Finance
GIIM 618 Seminar in Corporate Finance
GIIM 619 Marketing Management
GIIM 620 Financial Statement Analysis II
GIIM 621 Fixed Income Analysis
GIIM 622 Derivatives
GIIM 623 Asset Pricing and Portfolio Management II
GIIM 624 Analysis of Equity Investments
GIIM 626 Organizational Behavior
GIIM 631 Asset Allocation and Performance Measurement
GIIM 633 Investment Law and Ethics
GIIM 636 Alternative Investments
GIIM 637 Strategic Management
GIIM 651 Management Information Systems
GIIM 653 Seminar in Investment Analysis and Management
GIIM 654 Seminar in International Investment Analysis and Management

Special Topics in Investment Management

GIIM 695 Special Topics in Investment Management (3 credits)
Note: When offered, this course may substitute a GIIM required core course, for which students must obtain approval of the Program Director in order to register.

Non-credit Electives

GIIM 625 CFA® Exam Preparation Course Level II
GIIM 634 CFA® Exam Preparation Course Level III

Course Descriptions

GIIM 610 Economics (3 credits)
This course will examine the theoretical basis and investment implications of macroeconomic and microeconomic principles, including the key components of economic activity, industrial organization, macro theory and policy, international trade, and exchange rates.
Note: Students who have taken DIM 610, MIM 610, or IMBA 610 may not take this course for credit.

GIIM 611 Financial Statement Analysis I (3 credits)
This course will examine the fundamental financial statements and the impact of different accounting principles on those statements. The course will examine the treatment of such items as income taxes, inventories, depreciation, and leases from the perspective of the investment analyst. International differences in accounting standards will also be examined.
Note: Students who have taken DIM 611, MIM 611, or IMBA 611 may not take this course for credit.

GIIM 613 Asset Pricing and Portfolio Management I (1.5 credits)
This course will examine the efficient markets hypothesis and introduce the classic asset pricing models (domestic and international). The key elements of the theory and practice of the portfolio management process, including investment policy, asset allocation, and client relations will be examined in the domestic and international context.
Note: Students who have taken DIM 613, MIM 613, or IMBA 613 may not take this course for credit.

GIIM 614 Security Valuation in the Domestic and International Environment (3 credits)
This course will examine security (equity and fixed income) risk and valuation (for companies and industries) using alternative methodologies. The characteristics of global financial markets and the implications for security valuation will be examined. The theory and analysis of derivative securities will be introduced.
Note: Students who have taken DIM 614, MIM 614, or IMBA 614 may not take this course for credit.

GIIM 615 CFA® Exam Preparation Course Level I (1.5 credits)
This course will review the material needed for the Level I CFA® exam. Successful completion of this course includes passing the CFA® Level I Exam.
Note: Students who have taken DIM 615, MIM 615, or IMBA 615 may not take this course for credit.

GIIM 616 Quantitative Techniques (3 credits)
This course will examine the nature of the models used in the valuation and evaluation of investments, the theoretical and practical use of these models, comparison of classical or traditional models based on statistical analysis versus those based on more recent developments.
Note: Students who have taken DIM 612, MIM 612, IMBA 612, DIM 616, MIM 616, or IMBA 616 may not take this course for credit.

GIIM 617 Corporate Finance (1.5 credits)
This module covers the theory and practice of corporate finance with emphasis on concepts such as cash flow, liquidity, leverage, cost of capital, project evaluation, and dividend policy.
Note: Students who have taken DIM 612, MIM 612, IMBA 612, DIM 617, MIM 617, or IMBA 617 may not take this course for credit.

GIIM 618 Seminar in Corporate Finance (3 credits)
Prerequisite: For MIM and GIIM MBA Students: GIIM 615 or DIM 615 or MIM 615 or IMBA 615.
This course focuses on the application of modern finance theory to corporate decisions. It examines the firm's investment and financial decisions under various economic and financial conditions. Specific topics include mergers and acquisitions, leverage buyout decisions and dividend and equity management strategies.
Note: Students who have taken MIM 618 or IMBA 618 may not take this course for credit.

GIIM 619 Marketing Management (3 credits)
The main goal of this course is to develop a comprehensive understanding of the strategic role of marketing within the firm and within the Canadian context. It covers all aspects of the marketing management process. This course is designed to help develop the necessary skills to analyze market opportunities, research and select target markets, design effective marketing strategies, plan marketing programs, and organize, implement and control the marketing effort. The specificities of the marketing of services and their implications in terms of marketing strategies are emphasized.

GIIM 620 Financial Statement Analysis II (3 credits)
Prerequisite: For MIM and GIIM MBA students: GIIM 615 or DIM 615 or MIM 615 or IMBA 615.
This course examines the analysis and use of financial statements and disclosures in the investment valuation process, as well as the impact of international differences and managerial choice on the financial statements.
Note: Students who have taken DIM 620, MIM 620, or IMBA 620 may not take this course for credit.

GIIM 621 Fixed Income Analysis (1.5 credits)
Prerequisite: For MIM and GIIM MBA students: GIIM 615 or DIM 615 or MIM 615 or IMBA 615.
This course deals with the risk and return characteristics of debt instruments, term structure of interest rates, valuation of securities with embedded derivative securities or other unique features. The unique features of real estate and private equity investments are also covered.
Note: Students who have taken DIM 621, MIM 621, or IMBA 621 may not take this course for credit.

GIIM 622 Derivatives (3 credits)
Prerequisite: For MIM and GIIM MBA students: GIIM 615 or DIM 615 or MIM 615 or IMBA 615.
This course focuses on the theory and practice of futures, swaps and option valuation.
Note: Students who have taken DIM 622, MIM 622, or IMBA 622 may not take this course for credit.

GIIM 623 Asset Pricing and Portfolio Management II (1.5 credits)
Prerequisite: For MIM and GIIM MBA students: GIIM 615 or DIM 615 or MIM 615 or IMBA 615.
This course analyzes the theory and critically evaluates the empirical evidence regarding asset pricing models. Implications for the correlation structure of returns and the impact on risk and return forecasting are also covered. This course discusses the role of alternative portfolio management philosophies and their implications for asset valuations and portfolio performance evaluation. Topics include the use and role of quantitative methods in the evaluation and forecasting of investment performance as well as the implications of asset pricing model predictions and failures for portfolio management.
Note: Students who have taken DIM 623, MIM 623, or IMBA 623 may not take this course for credit.

GIIM 624 Analysis of Equity Investments (3 credits)
Prerequisite: For MIM and GIIM MBA students: GIIM 615 or DIM 615 or MIM 615 or IMBA 615.
This course reviews the use of fundamental analysis and other methodologies to generate investment valuations and risk analyses. The impact of special situations on the valuation process and the valuation of equity derivative securities will be examined.
Note: Students who have taken DIM 624, MIM 624, or IMBA 624 may not take this course for credit.

GIIM 625 CFA® Exam Preparation Course Level II (non-credit)
Prerequisite: GIIM 615, DIM 615, MIM 615 or IMBA 615.
This course will review the material needed for the Level II CFA® exam. Permission of the Program is required to register for this course.

GIIM 626 Organizational Behaviour (3 credits)
This course focuses on individual and group behavior and the interactions of behavioural phenomena. Concepts such as motivation, leadership, group behaviour and managing change in organizations are examined. Students acquire an understanding of change processes and skills relating to organizational diagnosis and change.

GIIM 631 Asset Allocation and Performance Measurement (3 credits)
Prerequisite: GIIM 625, DIM 625, MIM 625, or IMBA 625.
This course will examine the estimation of expected returns and risks for asset classes and individual assets, the development of strategies for managing portfolios of domestic and foreign securities (equity, fixed income, real estate, etc.), the management of portfolio risk, and the evaluation of portfolio and manager performance.
Note: Students who have taken DIM 631, MIM 631, IMBA 631, DIM 632, MIM 632, or IMBA 632 may not take this course for credit.

GIIM 633 Investment Law and Ethics (3 credits)
Prerequisite: For MIM and GIIM MBA students: GIIM 625 or DIM 625 or MIM 625 or IMBA 625.
This course covers issues regarding the management of investment funds including techniques for the identification and prevention of professional misconduct, and the nature and drafting of compliance procedures. The practice of portfolio management and investment valuation are studied through the use of topical cases.
Note: Students who have taken DIM 633, MIM 633, or IMBA 633 may not take this course for credit.

GIIM 634 CFA® Exam Preparation Course Level III (non-credit)
Prerequisite: GIIM 625, DIM 625, MIM 625, or IMBA 625.
This course will review the material needed for the Level III CFA® exam. Permission of the Program is required to register for this course.

GIIM 636 Alternative Investments (1.5 credits)
Prerequisite: GIIM 625, DIM 625, MIM 625, or IMBA 625.
This course will cover a description of investments such as hedge funds, real estate and the private equity market.
Note: Students who have taken DIM 621, MIM 621, IMBA 621, MIM 636, or IMBA 636 may not take this course for credit.

GIIM 637 Strategic Management (3 credits)
This course integrates the core functional disciplines of business within a strategic perspective and introduces several strategic management concepts, including industry analysis and dynamics, the organizational resource audit, strategic typologies, the role of the general manager, and the management of strategic transformations. The principal goal is to develop and enhance student ability in problem identification, environmental and organizational analysis, strategic alternative formulation, and action implementation. The pedagogy of the course is based upon comprehensive case studies that deal with strategic issues in a variety of contemporary business contexts.

GIIM 651 Management Information Systems (3 credits)
The aims of this course are to provide students with an in-depth exposure to the capabilities of computers as information processors and decision support tools, and to introduce the fundamentals of management information systems. These fundamentals are studied at the personal and organizational levels within a systems analysis and design framework. Use of software tools for solving different types of information processing problems in business is demonstrated and practiced.

GIIM 653 Seminar in Investment Analysis and Management (3 credits)
Prerequisite: GIIM 625, DIM 625, MIM 625, or IMBA 625.
This course will concentrate heavily on portfolio risk management issues. Topics such as the effect of cash drag, the use of equity and debt derivatives to manage risk and the uses and abuses of value at risk (VAR) will be explored. Other topics include equity style and its importance index funds and relevant criteria for the selection of investment managers.
Note: Students who have taken MIM 653 or IMBA 653 may not take this course for credit.

GIIM 654 Seminar in International Investment Analysis and Management (3 credits)
Prerequisite: GIIM 625, DIM 625, MIM 625, or IMBA 625.
This course begins with a discussion of exchange rates and to what extent economic factors and market sentiment are important in the determination of these rates. Issues of importance that international investors face will be examined along with the benefits of international diversification. The course will conclude with the analysis of issues relevant to emerging markets and factors that would influence the construction of a portfolio that may include an emerging market component.
Note: Students who have taken MIM 654 or IMBA 654 may not take this course for credit.

GIIM 695 Special Topics in Investment Management (3 credits)
Note: When offered, this course may substitute a GIIM required core course, for which students must obtain approval of the Program Director in order to register.

Business Administration

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DBA Website

Graduate Diploma in Business Administration

Admission Requirements

Applicants must possess a Bachelor's degree with a minimum cumulative grade point average of 2.70 on a scale of 4.30, or equivalent. Applicants are also required to submit a Statement of Purpose and two letters of recommendation.

Proficiency in English or French. Applicants whose first language is not English or French, and who are not Canadian citizens or permanent residents, must achieve a satisfactory performance in the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) before being considered for admission. The minimum required score for the TOEFL iBT is 80 and 550 for TOEFL PBT. The IELTS requires a minimum Band score of 6.5. This requirement will be waived for foreign students who have completed their undergraduate degree at a university where English or French is the language of instruction.

The Program reserves the right to require applicants to write tests of competence in English as a second language, and to take any English courses deemed necessary as a result of such tests. Please note these courses will not be counted towards the Diploma credit requirements.

Requirements for the Diploma

- **Credits.** The program consists of 10 courses (total 30 credits), comprised of eight core courses (24 credits), and two electives (6 credits).
- **Time Limit.** In accordance with university policy, all work for a diploma program must be completed within 6 terms (2 years) from the time of initial registration in the program for full-time students and within 12 terms (4 years) for part-time students.

Academic Regulations

GPA Requirements. The academic standing of each student is reviewed at the end of each term. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 2.70. Students whose GPA falls below 2.70 are considered to be on conditional standing during the following review period. Students who do not meet the requirements of their conditional standing are considered failed students and are withdrawn from the program. They may apply in writing to the Program Director for re-admission.

Failure Regulations. Students who receive a failing grade in the course of their studies, or who do not meet the requirements of their conditional standing, are withdrawn from the program. They may apply in writing to the Program Director for re-admission.

Graduation Requirement. In order to graduate, students must have a minimum cumulative GPA of 2.70.

Note: Students applying to Master's level programs at JMSB will not be granted advanced standing for courses taken in the Graduate Diploma in Business Administration Program.

Required Core Courses (24 credits)

GDBA 501 Accounting
GDBA 502 Statistics
GDBA 503 Organizational Behaviour
GDBA 504 Marketing
GDBA 505 Finance
GDBA 506 Operations Management
GDBA 507 Managerial Economics
GDBA 508 Business Ethics

Electives (6 credits)

Courses offered may vary from year to year. Elective courses are shown below:

GDBA 550 Retail Marketing
GDBA 551 Management Information Systems
GDBA 552 Public Relations and Fund Raising
GDBA 553 Human Resource Management
GDBA 595 Special Topics

To allow for a wider range of available electives, a selection of advanced level JMSB undergraduate courses are cross-listed with the Graduate Diploma in Business Administration Program. These cross-listed courses are:

ACCO 510 Governmental and Not-for-Profit Accounting
ACCO 555 Fraud Prevention and Investigation
DESC 545 Statistical Software for Data Management and Analysis
MANA 547 Leadership and Motivation
MARK 553 Advertising

Students who have received credit for ACCO 410, ACCO 470 (Fraud Examination, i.e. ACCO 470F), ACCO 455, DESC 445, MANA 447 and MARK 453 at the undergraduate level may not take the above cross-listed respective courses for credit.

Students must obtain prior approval from the Graduate Program Director in order to register for other electives.

Course Descriptions (Core Courses)

GDBA 501 Accounting (3 credits)
This course provides an introduction to the principles of financial accounting including the preparation and analysis of financial statements. It also offers an introduction to management accounting, including full costing and the use of standard costs for planning, budgeting and control. In addition, the relationship between costs, volume and profit, and accounting models for business decision-making are studied.

GDBA 502 Statistics (3 credits)
This course focuses on the applications of probability and statistics in business. Topics covered include descriptive measures, random variables and probability distributions, estimation, hypothesis testing, analysis of variance, regression and correlation analysis, time series analysis and forecasting techniques. Applications of these techniques in various business functions, such as marketing, finance, and operations management are studied through problems and cases. Computer applications are demonstrated using a statistical computer package.

GDBA 503 Organizational Behaviour (3 credits)
This course is concerned with understanding and managing individual and group behaviour in organizations using social and behavioural principles. Particular emphasis is placed on identifying and diagnosing the causes and consequences of effective and ineffective behaviour in organizations.

GDBA 504 Marketing (3 credits)
This course describes the principles of marketing and examines the process of developing a marketing strategy along with the factors and interrelationships related to the overall plan. Readings and cases are used to help students apply these concepts in a variety of business settings.

GDBA 505 Finance (3 credits)
This course provides students with a general understanding of the fundamental concepts of finance as they apply to financial management and investment analysis. Building on the objective of firm value maximization, students learn to describe and value risky financial securities and long-term capital projects as well as critically examine the firm's financing decisions and its ability to pay dividends.

GDBA 506 Operations Management (3 credits)
This course focuses on the quantitative and qualitative techniques used in business to achieve efficient and effective utilization of scarce resources. Planning, management and control of labor, machinery, material, money, information and time resources in manufacturing and service sectors are studied. The interactions with other functional areas, such as information systems, marketing, accounting and finance are illustrated through case studies. Recent developments in the area are introduced within the context of manufacturing and service strategies.

GDBA 507 Managerial Economics (3 credits)
This course covers the basic microeconomic concepts: demand and supply, production and cost, and market structures. The focus of the course is on utilizing these concepts to improve managerial decision-making.

GDBA 508 Business Ethics (3 credits)
Prerequisites: GDBA 501, GDBA 503, GDBA 504 and GDBA 505.
This course provides students with the opportunity to explore ethical theory as it relates to business. Using cases students learn with a hands-on approach to understand opposing views related to the ethical implications of business decisions.

Course Descriptions (Electives)

Courses offered may vary from year to year. Typical elective courses are shown below:

GDBA 550 Retail Marketing (3 credits)
This course takes a practical approach to the area of retailing. Topics covered include site selection, organizing and staffing the retail operation, the wholesaler-retailer relationship, consumer behaviour and branding in the retail situation.

GDBA 551 Management Information Systems (3 credits)
Management Information Systems (MIS) deals with coordination and use of information, information technology, and people. In this perspective, after having introduced MIS core concepts and principles, the focus of the course is on the role of the MIS department and of people in the organization. A socio-technical approach guides this course to ensure a balanced look at technical, informational, and personnel issues.

GDBA 552 Public Relations and Fundraising (3 credits)
This course introduces students to a variety of fundraising methods. It provides the context in which these methods might be used, and offers an understanding of how fundraising operates within the Canadian voluntary sector. Each student selects a registered charity for in-depth analysis and examines his/her chosen charity.

GDBA 553 Human Resource Management (3 credits)
Prerequisite: GDBA 503.
This course provides a sound background in the fundamentals, theory, principles, and practices of human resource management. It covers such topics as recruitment, selection and placement, performance appraisal, career planning and other pertinent issues in human resource management. The course uses cases to demonstrate and teach how these topics are integrated so as to prepare students to become effective managers.

GDBA 595 Special Topics (3 credits)

ACCO 510 Governmental and Not-for-Profit Accounting (3 credits)
Prerequisite: GDBA 501.
This course introduces the theory and concepts that underlie the financial accounting, control, and reporting in not-for-profit organizations. General concepts and principles are illustrated by comparing the practices of selected not-for-profit organizations, including local and federal governments and universities, with authoritative standards.
Note: Students who have received credit for ACCO 410 may not take this course for credit.

DESC 545 Statistical Software for Data Management and Analysis (3 credits)
Prerequisite: GDBA 502.
This course presents the principles and techniques of widely used statistical software systems, such as SAS, for data management (information storage and retrieval), data modification, file handling, and statistical analysis and reporting. The course covers special features such as graphics, macro languages, software and/or library interfacing and the basics of data mining. Classes are held in computer labs and half of the time is devoted to lab work.
Note: Students who have received credit for DESC 445 may not take this course for credit.

MANA 547 Leadership and Motivation (3 credits)
Prerequisite: GDBA 503.
This course familiarizes students with current research and theory on motivation and leadership, and their synergy and application in a work context. Implications for the design of reward systems and leader development are addressed. Class activities include student presentations, small group discussions,

exercises, cases, and simulations.
Note: Students who have received credit for MANA 447 may not take this course for credit

MARK 553 Advertising (3 credits)
Prerequisite: GDBA 504.
This course provides students with an introduction to the principles of advertising from three viewpoints: the nature of services provided by advertising agencies, the needs of the users (i.e., business, institutions) of these services, and the needs of society in economic, ethical, and legal terms.
Note: Students who have received credit for MARK 453 may not take this course for credit.

ACCO 555 Fraud Prevention and Investigation (3 credits)
Prerequisite: GDBA 501.
This course examines the principles and methodology used in fraud detection and deterrence. Topics covered include skimming, cash larceny, check tampering, billing, payroll and expense reimbursement schemes, non-cash misappropriations, corruption, fraudulent financial statements, conducting investigations and interviewing witnesses. This course also examines auditors' legal responsibilities towards fraud, the evaluation of internal controls and important pieces of legislation such as the Sarbanes-Oxley Act and the Criminal Code. Finally, the ethical aspects associated with fraud are discussed. Class sessions consist of lectures, real-life fraud case discussions and the presentation of material from the Association of Certified Fraud Examiners.
Note: Students who have received credit for ACCO 470 (Fraud Examination, i.e. ACCO 470F), ACCO 455 or ACCO 570 may not take this course for credit.

Business Administration

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CBA Website

Graduate Certificate in Business Administration

Admission Requirements

Applicants must possess a Bachelor's degree with a minimum cumulative grade point average of 2.70 on a scale of 4.30, or equivalent. Applicants are also required to submit a Statement of Purpose and two letters of recommendation.

Proficiency in English or French. Applicants whose first language is not English or French, and who are not Canadian citizens or permanent residents, must achieve a satisfactory performance in the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) before being considered for admission. The minimum required score for the TOEFL iBT is 80 and 550 for TOEFL PBT. The IELTS requires a minimum Band score of 6.5. This requirement will be waived for foreign students who have completed their undergraduate degree at a university where English or French is the language of instruction.

The Program reserves the right to require applicants to write tests of competence in English as a second language, and to take any English courses deemed necessary as a result of such tests. Please note these courses will not be counted towards the Certificate credit requirements.

Requirements for the Certificate

- **Credits.** The program consists of 5 courses (total 15 credits), comprised of four core courses (12 credits), and one elective (3 credits).
- **Time Limit.** In accordance with university policy, all work for a certificate program must be completed within 6 terms (2 years) from the time of initial registration in the program for full-time students and within 12 terms (4 years) for part-time students.

Academic Regulations

GPA Requirements. The academic standing of each student is reviewed at the end of each term. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 2.70. Students whose GPA falls below 2.70 are considered to be on conditional standing during the following review period. Students who do not meet the requirements of their conditional standing are considered failed students and are withdrawn from the program. They may apply in writing to the Program Director for re-admission.

Failure Regulations. Students who receive a failing grade in the course of their studies, or who do not meet the requirements of their conditional standing, are withdrawn from the program. They may apply in writing to the Program Director for re-admission.

Graduation Requirement. In order to graduate, students must have a minimum cumulative GPA of 2.70.

Note: Students applying to Master's level programs at JMSB will not be granted advanced standing for courses taken in the Graduate Certificate in Business Administration Program.

Required Core Courses (12 credits)

GDBA 501 Accounting
GDBA 503 Organizational Behaviour
GDBA 504 Marketing
GDBA 505 Finance

Electives (3 credits)

Courses offered may vary from year to year. Elective courses are shown below:

GDBA 550 Retail Marketing
GDBA 551 Management Information Systems
GDBA 552 Public Relations and Fund Raising
GDBA 553 Human Resource Management
GDBA 595 Special Topics

Upon approval from the Program Director, students may take one of the following GDBA core courses as an elective: GDBA 502, GDBA 506, GDBA 507 and GDBA 508.

GDBA 502 Statistics
GDBA 506 Operations Management
GDBA 507 Managerial Economics
GDBA 508 Business Ethics

To allow for a wider range of available electives, a selection of advanced level JMSB undergraduate courses are cross-listed with the Graduate Certificate in Business Administration Program. These cross-listed courses are:

ACCO 510 Governmental and Not-for-Profit Accounting
ACCO 555 Fraud Prevention and Investigation
DESC 545 Statistical Software for Data Management and Analysis
MANA 547 Leadership and Motivation
MARK 553 Advertising

Students who have received credit for ACCO 410, ACCO 470 (Fraud Examination, i.e. ACCO 470F), DESC 445, MANA 447 and MARK 453 at the undergraduate level may not take the above cross-listed respective courses for credit.

Students must obtain prior approval from the Graduate Program Director in order to register for other electives.

Course Descriptions (Core Courses)

GDBA 501 Accounting (3 credits)
This course provides an introduction to the principles of financial accounting including the preparation and analysis of financial statements. It also offers an introduction to management accounting, including full costing and the use of standard costs for planning, budgeting and control. In addition, the relationship between costs, volume and profit, and accounting models for business decision-making are studied.

GDBA 503 Organizational Behaviour (3 credits)
This course is concerned with understanding and managing individual and group behaviour in organizations using social and behavioural principles. Particular emphasis is placed on identifying and diagnosing the causes and consequences of effective and ineffective behaviour in organizations.

GDBA 504 Marketing (3 credits)
This course describes the principles of marketing and examines the process of developing a marketing strategy along with the factors and interrelationships related to the overall plan. Readings and cases are used to help students apply these concepts in a variety of business settings.

GDBA 505 Finance (3 credits)
This course provides students with a general understanding of the fundamental concepts of finance as they apply to financial management and investment analysis. Building on the objective of firm value

maximization, students learn to describe and value risky financial securities and long-term capital projects as well as critically examine the firm's financing decisions and its ability to pay dividends.

Course Descriptions (Electives)

GDBA 550 Retail Marketing (3 credits)
This course takes a practical approach to the area of retailing. Topics covered include site selection, organizing and staffing the retail operation, the wholesaler-retailer relationship, consumer behaviour and branding in the retail situation.

GDBA 551 Management Information Systems (3 credits)
Management Information Systems (MIS) deals with coordination and use of information, information technology, and people. In this perspective, after having introduced MIS core concepts and principles, the focus of the course is on the role of the MIS department and of people in the organization. A socio-technical approach guides this course to ensure a balanced look at technical, informational, and personnel issues..

GDBA 552 Public Relations and Fundraising (3 credits)
This course introduces students to a variety of fundraising methods. It provides the context in which these methods might be used, and offers an understanding of how fundraising operates within the Canadian voluntary sector. Each student selects a registered charity for in-depth analysis and examines his/her chosen charity.

GDBA 553 Human Resource Management (3 credits)
Prerequisite: GDBA 503.
This course provides a sound background in the fundamentals, theory, principles, and practices of human resource management. It covers such topics as recruitment, selection and placement, performance appraisal, career planning and other pertinent issues in human resource management. The course uses cases to demonstrate and teach how these topics are integrated so as to prepare students to become effective managers.

GDBA 595 Special Topics (3 credits)

Upon approval from the Program Director, students in the GCBA Program may use one of the GDBA core courses as an elective: GDBA 502, GDBA 506, GDBA 507 and GDBA 508.

GDBA 502 Statistics (3 credits)
This course focuses on the applications of probability and statistics in business. Topics covered include descriptive measures, random variables and probability distributions, estimation, hypothesis testing, analysis of variance, regression and correlation analysis, time series analysis and forecasting techniques. Applications

of these techniques in various business functions, such as marketing, finance, and operations management are studied through problems and cases. Computer applications are demonstrated using a statistical computer package.

GDBA 506 Operations Management (3 credits)
This course focuses on the quantitative and qualitative techniques used in business to achieve efficient and effective utilization of scarce resources. Planning, management and control of labor, machinery, material, money, information and time resources in manufacturing and service sectors are studied. The interactions with other functional areas, such as information systems, marketing, accounting and finance are illustrated through case studies. Recent developments in the area are introduced within the context of manufacturing and service strategies.

GDBA 507 Managerial Economics (3 credits)
This course covers the basic microeconomic concepts: demand and supply, production and cost, and market structures. The focus of the course is on utilizing these concepts to improve managerial decision-making.

GDBA 508 Business Ethics (3 credits)
Prerequisites: GDBA 501, GDBA 503, GDBA 504 and GDBA 505.
This course provides students with the opportunity to explore ethical theory as it relates to business. Using cases students learn with a hands-on approach to understand opposing views related to the ethical implications of business decisions.

ACCO 510 Governmental and Not-for-Profit Accounting (3 credits)
Prerequisite: GDBA 501.
This course introduces the theory and concepts that underlie the financial accounting, control, and reporting in not-for-profit organizations. General concepts and principles are illustrated by comparing the practices of selected not-for-profit organizations, including local and federal governments and universities, with authoritative standards.
Note: Students who have received credit for ACCO 410 may not take this course for credit.

DESC 545 Statistical Software for Data Management and Analysis (3 credits)
Prerequisite: GDBA 502.
This course presents the principles and techniques of widely used statistical software systems, such as SAS, for data management (information storage and retrieval), data modification, file handling, and statistical analysis and reporting. The course covers special features such as graphics, macro languages, software and/or library interfacing and the basics of data mining. Classes are held in computer labs and half of the time is devoted to lab work.
Note: Students who have received credit for DESC 445 may not take this course for credit.

MANA 547 Leadership and Motivation (3 credits)

Prerequisite: GDBA 503.

This course familiarizes students with current research and theory on motivation and leadership, and their synergy and application in a work context. Implications for the design of reward systems and leader development are addressed. Class activities include student presentations, small group discussions, exercises, cases, and simulations.

Note: Students who have received credit for MANA 447 may not take this course for credit

MARK 553 Advertising (3 credits)

Prerequisite: GDBA 504.

This course provides students with an introduction to the principles of advertising from three viewpoints: the nature of services provided by advertising agencies, the needs of the users (i.e., business, institutions) of these services, and the needs of society in economic, ethical, and legal terms.

Note: Students who have received credit for MARK 453 may not take this course for credit.

ACCO 555 Fraud Prevention and Investigation (3 credits)

Prerequisite: GDBA 501.

This course examines the principles and methodology used in fraud detection and deterrence. Topics covered include skimming, cash larceny, check tampering, billing, payroll and expense reimbursement schemes, non-cash misappropriations, corruption, fraudulent financial statements, conducting investigations and interviewing witnesses. This course also examines auditors' legal responsibilities towards fraud, the evaluation of internal controls and important pieces of legislation such as the Sarbanes-Oxley Act and the Criminal Code. Finally, the ethical aspects associated with fraud are discussed. Class sessions consist of lectures, real-life fraud case discussions and the presentation of material from the Association of Certified Fraud Examiners.

Note: Students who have received credit for ACCO 470 (Fraud Examination, i.e. ACCO 470F), ACCO 455 or ACCO 570 may not take this course for credit.

Chartered Accountancy

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Chartered Accountancy Website

Diploma in Chartered Accountancy

Admission Requirements. Applicants must possess a bachelor's degree. Students holding an undergraduate degree with a major in Accountancy, with high academic standing (minimum 3.00 GPA plus *B-* grade in specified courses), will normally have satisfied the prerequisite requirements. Applicants lacking the appropriate undergraduate work will be required to successfully complete certain qualifying courses, as assigned by the Director.

Requirements for the Diploma

A candidate is required to complete a minimum of 30 credits (comprised of the following 7 specific diploma courses):

ACCO 612
ACCO 613
ACCO 631
ACCO 635
ACCO 643
ACCO 678
ACCO 685

In addition to the required diploma courses in the program, students may register for one or more elective courses, with the permission of the Program Director.

Academic Regulations

- **Academic Standing.** The academic performance of all students will be reviewed at the end of each term based on the final grades for the courses completed during the term. To be considered in good standing, students must achieve a minimum cumulative grade point average (CGPA) of 2.70.

- **Conditional Standing.** Conditional standing is used to monitor the progress of students experiencing difficulty and to assist them in completing the program successfully. Students on conditional standing must achieve a minimum GPA of 2.70 during the period of conditional standing.
- **Failure Regulation.** A student who receives an *F* grade in a course will be withdrawn from the program.
- **Time Limit.** All work must be completed within two years (four years) from the year of initial registration in the program for full-time (part-time) students.
- **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 2.70.

Program Structure

Required Courses

ACCO 612 Financial Accounting Theory in Practice (4 credits)
This course addresses the application of accounting theory to practice. Topics include an examination of different approaches to financial accounting, the accounting standard setting process, the basic components of alternative accounting frameworks, and financial statement disclosure.

ACCO 613 Financial Accounting: Comprehensive Applications (4 credits)
Prerequisite: ACCO 612.
This course builds on the materials examined in Accounting 612. Study will focus on the integration of financial accounting theory with current reporting practices.

ACCO 631 Business Advisory Services (4 credits)
This course integrates knowledge obtained in various areas of accounting, auditing and taxation to solve problems covering a variety of business situations.

ACCO 635 An Integrated Approach to Auditing (4 credits)
Prerequisites: ACCO 678, ACCO 643; *Co-requisite:* ACCO 613.
This course introduces advanced topics in auditing as well as important CICA Handbook sections not previously covered in other auditing courses.

ACCO 643 Income Taxation (4 credits)
The course focuses on specialized topics in taxation. Coverage includes tax planning concepts and techniques; taxation aspects of business decisions, including purchase and sale of a business; transfers to and from a corporation; estate freezes; and corporate reorganizations.

ACCO 678 Contemporary Issues for Accountants (4 credits)
This course covers topics that will be of particular interest to chartered accountants. The topics covered will vary depending upon the issues that are of relevance to the profession given the nature of the business environment.

ACCO 685 Comprehensive Case Analysis and Integration, and Uniform Final Examination (UFE) Preparation (6 credits)
(This course is evaluated on a pass/no credit basis. Students are permitted to repeat this course only once).
Prerequisites: ACCO 613, ACCO 631, ACCO 635; or permission of the Program Director.
This course consists of comprehensive case analysis and integration and UFE preparation components and is intended for those students who plan to write the UFE in the year the course is taken. The course focuses on the integration of knowledge obtained in all other Diploma in Chartered Accountancy courses and builds application, diagnostic, analytical, and case writing skills through case analysis. In addition, the course includes UFE preparation seminars offered throughout the summer. Lectures are given on major UFE competency map areas by experts, and students focus on writing practice UFE questions.
Note: There is a surcharge for this course.

Elective Courses

ACCO 690A Introduction to Exam-writing Techniques (1 credit)
The objective of this course is to introduce the student to the requirements of the UFE board of examiners in assessing professional capabilities. The course is an introductory exam-writing techniques seminar that emphasizes the proper application of core knowledge and professional skills to exam scenarios. It is intended for those students entering the Diploma in Chartered Accountancy program who have experienced difficulties in communicating core knowledge in exam scenarios. Students will be expected to complete preparatory work in advance of the seminar.

ACCO 690B Advanced Exam-writing Techniques (1 credit)
The objective of this course is to develop the concepts that have been introduced to the student in ACCO 690A (or in a prior course setting). The course is an advanced exam-writing techniques seminar that emphasizes the professional skills required to deal with unusual and complex exam scenarios. It is intended for those students who plan to write the UFE within the year. Students will be expected to complete preparatory work in advance of the seminar.

ACCO 612T Tutorial in Financial Accounting Theory in Practice (4 credits)
(This course is evaluated on a pass/fail basis).
Co-requisite: ACCO 612. Permission of the Program Director is required.
This course is designed to enhance the competencies of students in the program who would benefit from

additional exposure to the subject matter covered in ACCO 612. This course is evaluated on the same basis as ACCO 612, in the term the course is taken.

ACCO 613T Tutorial in Financial Accounting: Comprehensive Applications (4 credits)
(This course is evaluated on a pass/fail basis).
Co-requisite: ACCO 613. Permission of the Program Director is required.
This course is designed to enhance the competencies of students in the program who would benefit from additional exposure to the subject matter covered in ACCO 613. This course is evaluated on the same basis as ACCO 613, in the term the course is taken.

ACCO 631T Tutorial in Business Advisory Services (4 credits)
(This course is evaluated on a pass/fail basis).
Co-requisite: ACCO 631. Permission of the Program Director is required.
This course is designed to enhance the competencies of students in the program who would benefit from additional exposure to the subject matter covered in ACCO 631. This course is evaluated on the same basis as ACCO 631, in the term the course is taken.

ACCO 635T Tutorial in An Integrated Approach to Auditing (4 credits)
(This course is evaluated on a pass/fail basis).
Co-requisite: ACCO 635. Permission of the Program Director is required.
This course is designed to enhance the competencies of students in the program who would benefit from additional exposure to the subject matter covered in ACCO 635. This course is evaluated on the same basis as ACCO 635, in the term the course is taken.

ACCO 643T Tutorial in Income Taxation (4 credits)
(This course is evaluated on a pass/fail basis).
Co-requisite: ACCO 643. Permission of the Program Director is required.
This course is designed to enhance the competencies of students in the program who would benefit from additional exposure to the subject matter covered in ACCO 643. This course is evaluated on the same basis as ACCO 643, in the term the course is taken.

ACCO 678T Tutorial in Contemporary Issues for Accountants (4 credits)
(This course is evaluated on a pass/fail basis).
Co-requisite: ACCO 678. Permission of the Program Director is required.
This course is designed to enhance the competencies of students in the program who would benefit from additional exposure to the subject matter covered in ACCO 678. This course is evaluated on the same basis as ACCO 678, in the term the course is taken.

Management Accountancy

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CMA Website

Graduate Certificate in Management Accounting

Admission Requirements

Applications to the program should be addressed to: Ordre des comptables en management accrédités du Québec, 715 Square Victoria, 3e étage, Montréal, Québec H2Y 2H7.

Acceptance into the program is based on the following:

- A bachelor's degree (with a minimum cumulative grade point average of 2.70 on a scale of 4.30, or equivalent), or qualifications accepted as equivalent by the School of Graduate Studies.
- A minimum of five years of relevant experience in a managerial position.

Academic Regulations

- **Time Limit.** All students must complete the program within three years from the initial registration into the program.
- **Academic Standing.** The academic performance of all students will be reviewed at the end of each term based on the final grades for the courses completed during the term. To be considered in good standing, students must achieve a minimum cumulative grade point average (CGPA) of 2.70.
- **Conditional Standing.** Conditional standing is used to monitor the progress of students experiencing difficulty and to assist them in completing the program successfully. Students on conditional standing must achieve a minimum GPA of 2.70 during the period of conditional standing.
- **Failure Regulation.** Students who receive a failing grade in a course in the program, or do not meet the requirements for their conditional standing are withdrawn from the program.
- **Graduation.** To graduate, students must achieve a minimum cumulative GPA of 2.70.
- **MBA Option for Graduate Certificate in Management Accounting Students.** Advanced Standing for the MBA Program. Students in good academic standing who meet the admission requirements of the MBA Program, and who have completed the requirements for the Graduate Certificate in

Management Accounting Program, may be granted advanced standing for up to 21 credits upon admission to the MBA Program.

Students who have completed the course work in the Graduate Certificate in Management Accounting Program will be required to complete the following courses (total 36 credits):

MBA 606 Managerial Economics
MBA 608 Statistical Models for Business Decisions
MBA 609 Organizational Behaviour
MBA 610 Marketing Management
MBA 616 Operations Management
MBA 618 National and International Economics
MBA 622 Business Policy and Strategy
MBA 625 Managing Strategic Action
MBA 691 Business Ethics
+ 3 electives

Note: Students who have had their Certificate conferred will not receive transfer credits to the MBA Program. Course exemptions may be granted, but they must be replaced by alternative courses.

Requirements for the Certificate

The program consists of eight courses (23 credits). Transfer credits may be given for a maximum of two courses if, in the opinion of the program committee, the applicant has successfully completed the equivalent of a given course in a graduate program at another recognized university.

The program can be completed on a part-time basis over a period of 17 months (August of Year I to December of Year II). Please note that the program's courses, including dates for withdrawals from courses, do not follow the regular time periods listed at the start of this calendar. Please consult the program director for details.

The eight courses are:

ACCO 661 Financial Accounting and Reporting I
ACCO 662 Management Accounting I
ACCO 671 Financial Accounting and Reporting II
ACCO 672 Management Accounting II
FINA 620 Financial Management
ACCO 673 Specialized Topics in Taxation (2 credits)

ACCO 681 Financial Accounting and Reporting III
ACCO 682 Comprehensive Case Analysis

Courses

All courses are 3 credits unless otherwise specified.

ACCO 661 Financial Accounting and Reporting I
This course examines the theory and practice involved in measuring, reporting, and analyzing an organization's financial information. It provides an overview of the preparation, presentation and analysis of financial statements with an emphasis on existing accounting standards as prescribed by the Canadian Institute of Chartered Accountants (CICA) Handbook and other relevant accounting literature. The course focuses on measurement and reporting issues concerning tangible and intangible assets, leases, contingencies and subsequent events as well as revenue recognition in different industries.
Note: Students who have received credit for ACCO 561 may not take this course for credit.

ACCO 662 Management Accounting I
This course examines techniques and control systems that help the manager make better economic decisions. Topics include break-even analysis, activity-based costing, budgeting, productivity evaluation and cost control, and costs relevant for pricing decisions. Case studies are used in order to apply concepts learned.
Note: Students who have received credit for ACCO 562 may not take this course for credit.

ACCO 671 Financial Accounting and Reporting II
Prerequisite: ACCO 661.
Building on Financial Accounting and Reporting I, this course develops both professional judgement and decision making in financial statement preparation and analysis by examining several current measurement and disclosure issues in financial accounting as prescribed by the Canadian Institute of Chartered Accountants (CICA) Handbook and accounting literature. Topics include accounting for long-term debt, employee future benefits, future income tax, financial instruments and earnings per share.
Note: Students who have received credit for ACCO 571 may not take this course for credit.

ACCO 672 Management Accounting II
Prerequisite: ACCO 662.
Building on Management Accounting I, this course extends the coverage of productivity and cost control measures and enables students to utilize their skills for solving several case studies in a group setting. Management accounting literature is also studied in conjunction with several case studies that require integration of management accounting with financial accounting and other issues.
Note: Students who have received credit for ACCO 572 may not take this course for credit.

ACCO 673 Specialized Topics in Taxation (2 credits)

Prerequisite: ACCO 661.

This course focuses on specialized topics in taxation relevant for the Certified Management Accountant. It examines the Federal taxation of employment, business, capital gains and other income. It also covers taxation of corporations, transfers of property and the Canadian sales tax system.

Note: Students who have received credit for ACCO 573 may not take this course for credit.

ACCO 681 Financial Accounting and Reporting III

Prerequisite: ACCO 671.

Building on previous Financial Accounting and Reporting courses, this course focuses on Canadian Institute of Chartered Accountants (CICA) reporting standards related to corporate investments, foreign currency, not-for-profit organizations, and other current accounting issues. Relevant accounting literature is used to gain additional insight into these topics.

Note: Students who have received credit for ACCO 581 may not take this course for credit.

ACCO 682 Comprehensive Case Analysis

Prerequisites: ACCO 681 and FINA 620.

The objective of this course is to integrate the financial and managerial accounting knowledge acquired in the previous courses. It also incorporates relevant topics in related areas including: internal control, auditing, information technology, taxation, business law, organizational behaviour, marketing, operations management and strategic management. This capstone course is designed to allow candidates to consolidate and apply all areas of knowledge in preparation for the Strategic Leadership Program and their future as qualified Certified Management Accountants.

Note: Students who have received credit for ACCO 582 may not take this course for credit.

FINA 620 Financial Management

Prerequisites: ACCO 661 and ACCO 662.

This course provides the student with an understanding of the concepts underlying the financing and investment decisions of organizations. The course focuses on the role of financial markets and intermediaries, the relationship between risk and return, the cost of capital and its measurement, capital structure and leverage, working capital management and dividend policy. In addition, the theory is applied to case studies.

Note: Students who have received credit for FINA 520 may not take this course for credit.

Individualized Program (INDI)

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INDI Website

Doctor of/Doctorate in Philosophy (Individualized Program)
Master of/Magisteriate in Arts/Science (Individualized Program)

Admissions

Only outstanding applicants will be considered. Interested candidates should immediately consult the Individualized Program's (INDI) website to determine fields of study, potential supervisory committee members and other application procedures. Applicants should take note that entry to this program requires a clearly formulated program of study and the identification of a proposed supervisory committee as part of the application. (Doctoral applicants interested in pursuing a degree in inter-disciplinary studies in the areas of Interdisciplinary Studies in Society and Culture should apply to the Humanities Doctoral Program).

The INDI Program Committee reviews all application material submitted by the applicant.

Doctor of/Doctorate in Philosophy (Individualized Program)

Program Requirements

The Individualized Program exists to promote innovative and creative approaches to issues that are outside the normal boundaries of investigation of existing graduate programs. Students are engaged in individualized research initiatives supported by an integrated program of study drawing on the various resources available at the University both within a Faculty or across Faculties. In most cases, individuals applying to an Individualized Program must propose a program of study involving multidisciplinary scholarship on problems that are not normally the province of disciplines represented by departments in this University. These applicants propose a supervisory committee involving faculty from at least two different departments/units. However, a limited number of students may be admitted who propose programs within a single discipline and involving faculty from only one department/unit. In all cases, applicants include a proposed supervisory committee, courses, and research plan.

Course Requirements for Students with a Pure and Applied Science, Computer Science or Engineering Concentration. Students with a pure and applied science, computer science or engineering concentration have the option of taking up to two directed research courses in fulfillment of their coursework requirements. The primary objective of such a course is for the student to acquire competencies in discipline specific research practices and/or generate useable research data under the direction of their principal supervisor.

Candidates admitted to an Individualized Program are required to conform to School of Graduate Studies regulations for graduate students.

Admission Requirements. Candidates must have completed a master's degree or its equivalent in a relevant disciplinary area.

Credits. Candidates are required to complete a minimum of 90 credits apportioned as follows:

- **Coursework:** 18 credits of coursework to be taken from Doctoral Level Studies INDI courses OR from any regularly scheduled graduate courses. Students must have the permission of the INDI Director to register for regularly scheduled graduate courses.
    - Students are required to complete a minimum of 6 credits of regularly scheduled courses.
    - Students must take 3 credits from a research methodology seminar in their first or second year. The 3 credits must be chosen from among the numerous courses in methodology offered by various departments at Concordia University.
- **Doctoral Comprehensive Examination:** INDI 885 (3 credits)
- **Doctoral Thesis Proposal:** INDI 887 (3 credits)
- **Doctoral Research and Thesis**: INDI 890 (66 credits)

Residence. The minimum period of residence is 24 months of full-time study, or its equivalent in part-time study.

C Rule. Students are allowed no more than one *C* grade while registered in an Individualized Program. Students who receive more than one *C* grade will be withdrawn from the program.

F Rule. Students who receive an *F* grade will be withdrawn from the program.

Graduation Requirement. In order to graduate, students must have a cumulative GPA of at least 3.00.

Master of/Magisteriate in Arts/Science (Individualized Program)

Program Requirements

The Individualized Program exists to promote innovative and creative approaches to issues that are outside the normal boundaries of investigation of existing graduate programs. Students are engaged in individualized research initiatives supported by an integrated program of study drawing on the various resources available at the University both within a Faculty or across Faculties. In most cases, individuals applying to an Individualized Program must propose a program of study involving multidisciplinary scholarship on problems that are not normally the province of disciplines represented by departments in this University. These applicants propose a supervisory committee involving faculty from at least two different departments/units. However, a limited number of students may be admitted who propose programs within a single discipline and involving faculty from only one department/unit. In all cases, applicants include a proposed supervisory committee, courses, and research plan.

Course Requirements for Students with a Pure and Applied Science, Computer Science or Engineering Concentration. Students with a pure and applied science, computer science or engineering concentration have the option of taking up to two directed research courses in fulfillment of their coursework requirements. The primary objective of such a course is for the student to acquire competencies in discipline specific research practices and/or generate useable research data under the direction of their principal supervisor.

Candidates admitted to an Individualized Program are required to conform to School of Graduate Studies regulations for graduate students.

Admission Requirements. Candidates must have completed a bachelor's degree with high academic standing in a relevant disciplinary area or its equivalent.

Credits. Candidates are required to complete a minimum of 45 credits apportioned as follows:

- **Coursework:** 18 credits of coursework to be taken from Master's Level Studies INDI courses OR from any regularly scheduled graduate courses. Students must have the permission of the INDI Director to register for regularly scheduled graduate courses.
    - Students are required to complete a minimum of 6 credits of regularly scheduled courses.
    - Students must take 3 credits from a research methodology seminar in their first or second year. The 3 credits must be chosen from among the numerous courses in methodology offered by various departments at Concordia University.
- **Master's Thesis Proposal:** INDI 687 (3 credits)
- **Master's Research and Thesis:** INDI 690 (24 credits)

Residence. The minimum period of residence is 12 months of full-time study, or its equivalent in part-time study.

C Rule. Students are allowed no more than one *C* grade while registered in an Individualized Program. Students who receive more than one *C* grade will be withdrawn from the program.

F Rule. Students who receive an *F* grade will be withdrawn from the program.

Graduation Requirement. In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses

Students engaged in multidisciplinary studies are normally required to take a minimum of 9 credits in regularly scheduled graduate courses, including a research methodology seminar in their first or second year. The latter seminar explores methodological issues relevant to the principal area of the student's research. It is chosen in consultation with the student's principal supervisor from among the numerous courses in methodology offered by different departments at Concordia University. Please note that special permission from the departments in question (Chair or Graduate Program Director and Instructor) is necessary in order to have access to these courses. Individualized Program courses are designated INDI with successive numbers in the 600 sequence for master's students and in the 800 sequence for doctoral students.

INDI 800-819 Doctoral Level Studies (6 credits)
INDI 820-839 Doctoral Level Studies (3 credits)
INDI 840-884 Doctoral Level Studies (variable credits)
INDI 885 Doctoral Comprehensive Examination (3 credits)

INDI 886 Special Topics (3 credits)
This optional seminar addresses a topic or range of topics of relevance to the research interests of a cross-section of the students enrolled in the program.

INDI 887 Doctoral Thesis Proposal (3 credits)
INDI 890 Doctoral Research and Thesis (66 credits)

INDI 898 Doctoral Directed Research Course (variable credits)
The student conducts research in a lab or another research site under the direction of his/her principal supervisor.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. INDI 898A, INDI 898B, etc. These courses will be graded pass/fail.

INDI 899 International Doctoral Level Studies (3 credits)

INDI 600-619 Master's Level Studies (6 credits)
INDI 620-639 Master's Level Studies (3 credits)
INDI 640-684 Master's Level Studies (variable credits)

INDI 686 Special Topics (3 credits)
This optional seminar addresses a topic or range of topics of relevance to the research interests of a cross-section of the students enrolled in the program.

INDI 687 Master's Thesis Proposal (3 credits)
INDI 690 Master's Research and Thesis (24 credits)

INDI 698 Master's Directed Research Course (variable credits)
The student conducts research in a lab or another research site under the direction of his/her principal supervisor.
Note: The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content will be indicated by a letter following the course number, e.g. INDI 698A, INDI 698B, etc. These courses will be graded pass/fail.

INDI 699 International Master's Level Studies (3 credits)

Comprehensive Examination

At the doctoral level, students are required to write an examination testing their basic knowledge of the relevant areas of each component discipline comprising their program of study. The supervisory committee supplies the student with an appropriate reading list to prepare for this examination.
Students are additionally required to write a Doctoral Comprehensive Examination Essay (5000-6000 words) that integrates the component disciplines of the program of study in addressing a particular issue. The student makes a formal essay topic proposal to the supervisory committee which decides with the student boundaries and expectations for the essay. The student is then given three weeks to submit the essay.

The supervisory committee evaluates these examinations; it may, however, consult with other faculty members in relevant areas where additional expertise is required for the evaluation. The principal supervisor submits the reading list, the questions, the answers/essay, and the evaluations along with the pass/fail grade to the INDI Director.

Thesis

A thesis in an Individualized Program represents a unique contribution to scholarship undertaken while the student is enrolled in the program. The master's and doctoral theses offered at this University in cognate

areas will normally provide an appropriate guide to the format and scope of the Individualized Program thesis requirements.

In the case of a nontraditional thesis – such as one involving a creative production – the requirement of scholarly contribution still applies. Thus, while a thesis may present a creative work as its central focus, it should nevertheless provide a scholarly discussion placing that work in the context of related ideas and works. As in the case of traditional theses, the nontraditional thesis is submitted to an oral examination where it is exposed to scholarly criticism and where the student is given an opportunity to defend it.

The thesis defence must provide for the inclusion of one external examiner at the doctoral level. At the master's level, the thesis defence will include the student's principal supervisor and at least two other committee members, one of whom may be an external examiner.