

# Graduate Calendar

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## **Carleton University Calendar**

Welcome to the online version of Carleton University's Graduate and Undergraduate Calendar. Every effort has been made to ensure the accuracy of this Calendar. From time to time, errata and post-publication updates approved by Senate after initial publication of the Calendar are posted. Notifications of additions and corrections will be posted at the Updates page. The Web edition of the Carleton University Graduate and Undergraduate Calendar is the University's official statement. This Calendar is published several months in advance of the beginning of the academic year. The university reserves the right without liability or penalty, and without notice, to make changes in the services and programs that it offers, including alteration of the fee schedules, and cancellation of particular courses. [Read full disclaimer here.](#)

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## Accreditation of the University

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### Accreditation

Carleton University, a founding member of the Council of Ontario Universities, enjoys full accreditation by the Ministry of Advanced Education and Skills Development of the Province of Ontario.

All programs of study leading to a Bachelor of Engineering degree are accredited by the Canadian Engineering Accreditation Board of Engineers Canada.

In Canada, the Canadian Architectural Certification Board (CACB) is the sole agency authorized by the Regulatory Organization of Architecture in Canada (ROAC) to accredit Canadian professional degree programs in architecture for the purposes of architectural licensure. Source: CACB. In 2024, the CACB granted the Azrieli School of Architecture and Urbanism a full 6-year renewal of accreditation for the M.Arch. program. The School's next accreditation review will be in 2030. For more information on CACB accreditation, see CACB Conditions for Accreditation.

The Bachelor's, Master's and Doctoral programs offered by the Sprott School of Business are accredited by the Association to Advance Collegiate Schools of Business (AACSB International) and by the Network of International Business Schools (NIBS).

The Bachelor of Computer Science Honours Degree Program is accredited by the Accreditation Council of the Canadian Information Processing Society.

The B.Sc. Honours Chemistry and B.Sc. Honours Chemistry with Concentration in Nanotechnology are accredited by the Canadian Society for Chemistry.

The School of Industrial Design was established at Carleton on the recommendation of a study prepared by the Association of Canadian Industrial Designers. Initial funding for the school was supplied by Design Canada, Ministry of Industry, Trade and Commerce.

The Bachelor of Mathematics Honours Degree Program in Statistics is accredited by the Statistical Society of Canada (SSC).

The Bachelor of Social Work and Master of Social Work degree programs have been fully accredited by the Canadian Association of Social Work Education.

Carleton University participates in the Ontario Student Assistance Program, other provincial assistance programs and the Canada Student Loans Program, and is recognized for the Quebec Loans and Bursaries Program.

Carleton University's degree programs are recognized in the United States by the William D. Ford Federal Direct Loan (Direct Loan) Program and by the U.S. Department of Veterans Affairs.

## AcademicYearIntro

This schedule contains the dates prescribed by the University Senate for academic activities. Dates relating to fee payment, cancellation of course selections, late charges, and other fees or charges will be published in the Dates and Deadlines section of the Registration Website ([carleton.ca/registration](http://carleton.ca/registration)).

The academic year is divided into three terms:

**Summer term:** May - August

**Fall term:** September - December

**Winter term:** January - April

Courses are offered in the following patterns:

**Early summer:** May - June

**Late summer:** July - August

**Full summer:** May - August

**Early fall:** September - October

**Late fall:** November - December

**Full fall:** September - December

**Early winter:** January - February

**Late winter:** March - April

**Full winter:** January - April

**Fall/winter:** September - April

Courses are offered during the day and in the evening.

## The Academic Year (Graduate and Undergraduate Studies)

**Summer 2025**

**Fall 2025**

**Winter 2026**

**Summer 2026**

Date	Activity
SUMMER TERM 2025	
March 1, 2025	Last day for receipt of applications for admission to an undergraduate degree program for the summer term.
April 28, 2025	Deadline for course outlines to be made available to students registered in early summer and full summer courses.
May 1, 2025	Last day for receipt of applications for undergraduate degree program transfers for the summer term.
May 5, 2025	Summer term begins. Early summer and full summer classes begin.
May 9, 2025	Last day for registration and course changes (including auditing) in early summer courses.

Graduate students who have not electronically submitted their final thesis copy to the Faculty of Graduate and Postdoctoral Affairs will not be eligible to graduate in spring 2025 and must register for the summer 2025 term.

May 16, 2025	Last day for registration and course changes (including auditing) in full summer courses.
	Last day to withdraw from early summer courses with a full fee adjustment.
May 16-28, 2025	Full winter, late winter, and fall/winter term deferred final examinations will be held.
May 19, 2025	Statutory holiday. University closed.
May 31, 2025	Last day to withdraw from full summer courses with a full fee adjustment.
June 1, 2025	Last day for academic withdrawal from early summer courses.
	Last day to request Formal Examination Accommodations for June examinations from the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfil accommodation requests received after the specific deadlines.
June 10, 2025	Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade in early summer term undergraduate courses before the official examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar).
June 17, 2025	Last day of early summer classes. (NOTE: full summer classes resume July 2.)

	Last day for take-home examinations to be assigned, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.	August 1, 2025	Last day for academic withdrawal from full and late summer courses.
	Last day that can be specified by a course instructor as a due date for term work for early summer courses.		Last day to request Formal Examination Accommodations for August final examinations from the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfil accommodation requests received after the specified deadlines.
June 18-19, 2025	No classes or examinations take place.	August 4, 2025	Statutory holiday. University closed.
June 20-26, 2025	Final examinations in early summer courses and mid-term examinations in full summer courses will be held. Examinations are normally held all seven days of the week.	August 7, 2025	Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade in late summer and full summer term undergraduate courses, before the official examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar).
June 25, 2025	Deadline for course outlines to be made available to students registered in late summer courses.		
June 26, 2025	All final take-home examinations are due on this day, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.	August 14, 2025	Last day of late summer and full summer classes.
July 1, 2025	Statutory holiday. University Closed.		Classes follow a Monday schedule.
July 2, 2025	Late summer classes begin and full summer classes resume.		Last day for final take-home examinations to be assigned, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.
July 8, 2025	Last day for registration and course changes (including auditing) in late summer courses.		Last day that can be specified by a course instructor as a due date for term work for late summer and full summer courses.
July 15, 2025	Last day to withdraw from late summer courses with a full fee adjustment.	August 15-16, 2025	No classes or examinations take place.
July 18-20, 2025	Early summer term deferred final examinations will be held.	August 17-23, 2025	Final examinations in late summer and full summer courses will be held. Examinations are normally held all seven days of the week.
July 20, 2025	Last day for graduate students to submit their supervisor-approved thesis, in examinable form to the department.		

August 23, 2025	All final take-home examinations are due on this day, with the exception of those conforming to the examinations regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.		Graduate students who have not electronically submitted their final thesis copy to Graduate Studies will not be eligible to graduate in fall 2025 and must register for the fall 2025 term.
September 19-21, 2025	Full summer and late summer term deferred final examinations will be held.	September 19-21, 2025	Full summer and late summer term deferred final examinations will be held.
<b>Date</b>	<b>Activity</b>	<b>September 30, 2025</b>	<b>Last day to withdraw from full fall and fall/winter courses with a full fee adjustment.</b>
FALL TERM 2025		<b>October 1, 2025</b>	<b>Last day for academic withdrawal from early fall courses.</b>
August 27, 2025	Deadline for course outlines to be made available to students registered in full fall, early fall, and fall/winter courses.		Last day to request Formal Examination Accommodations for Oct/ Nov final examinations from the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfil accommodation requests received after the specified deadlines.
August 31, 2025	Last day for receipt of applications from potential fall (November) graduates.	October 9, 2025	Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade, in early fall term undergraduate courses, before the official Oct/ Nov final examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar).
September 1, 2025	Statutory holiday. University closed.	October 10, 2025	December examination schedule (fall term final and fall/winter mid-terms) available online.
September 2, 2025	Academic orientation (undergraduate and graduate students).	October 13, 2025	Statutory holiday. University closed.
	Orientation for new Teaching Assistants.	October 15, 2025	Last day for receipt of applications for admission to an undergraduate degree program for the winter term from applicants whose documents originate from outside Canada or the United States.
	All new students are expected to be on campus. Class and laboratory preparations, departmental introductions for students, and other academic preparation activities will be held.	October 16, 2025	Last day of early fall classes.
September 3, 2025	Fall term begins. Full fall, early fall, and fall/winter classes begin.		
September 9, 2025	Last day for registration and course changes (including auditing) in early fall courses.		
September 16, 2025	Last day for registration and course changes (including auditing) in full fall, late fall, and fall/winter courses.		
	Last day to withdraw from early fall courses with a full fee adjustment.		

	<p>Last day for final take-home examinations to be assigned in early fall courses, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.</p> <p>Last day that can be specified by a course instructor as a due date for term work for early fall courses.</p>	November 21, 2025	<p>Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade, in full fall term or fall/winter undergraduate courses, before the official December final examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar).</p>
October 20, 2025	Deadline for course outlines to be made available to students registered in late fall courses.	November 28, 2025	<p>Last day for graduate students to submit their supervisor-approved thesis, in examinable form to the department.</p> <p>Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade, in late fall term undergraduate courses, before the official final examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar).</p>
October 20-24, 2025	Fall break, no classes.		
October 25-26, November 1-2, 2025	Final examinations in early fall undergraduate courses will be held.		
October 27, 2025	Late fall classes begin.		
November 7, 2025	Last day to withdraw from late fall term courses with a full fee adjustment.		
November 14-16, 2025	Early fall undergraduate deferred final examinations will be held.		
November 15, 2025	<p>Last day for academic withdrawal from full fall and late fall courses.</p> <p>Last day to request Formal Examination Accommodations for December full fall and late fall examinations and fall/ winter midterm examinations from the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfil accommodation requests received after the specified deadlines.</p>	November 30, 2025	<p>Last day for receipt of applications from potential winter (February) graduates.</p>
		December 5, 2025	<p>Fall term ends.</p> <p>Last day of full fall and late fall classes.</p> <p>Classes follow a Monday schedule.</p>
	Last day for receipt of applications for admission to an undergraduate degree program for the winter term.		<p>Last day for final take-home examinations to be assigned, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.</p> <p>Last day that can be specified by an instructor as a due date for term work for full and late fall courses.</p>

	Last day for receipt of applications for undergraduate degree program transfers for winter term.	January 23-25, January 30-February 1, 2026	Full fall and late fall term deferred final examinations will be held.
December 6-7, 2025	No classes or examinations take place.	January 31, 2026	Last day to withdraw from full winter courses and the winter portion of fall/winter courses with a full fee adjustment.
December 8-20, 2025	Final examinations in full fall and late fall courses and mid-term examinations in fall/winter courses will be held. Examinations are normally held all seven days of the week.	February 1, 2026	Last day for academic withdrawal from early winter courses.
December 20, 2025	All final take-home examinations are due on this day, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/General Regulations of the Graduate Calendar.		Last day to request Formal Examination Accommodations for Feb/Mar final examinations from the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfil accommodation requests received after the specified deadlines.
December 24, 2025 at noon through January 2, 2026 inclusive	University closed.	February 6, 2026	Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade, in early winter undergraduate courses, before the official Feb/Mar final examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/General Regulations of the Graduate Calendar).
<b>Date</b>	<b>Activity</b>	<b>February 13, 2026</b>	Last day of early winter classes.
WINTER TERM 2026			Last day for final take-home examinations to be assigned in early winter courses, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/General Regulations of the Graduate Calendar.
December 29, 2025	Deadline for course outlines to be made available to students registered in full winter and early winter term courses.		Last day that can be specified by an instructor as a due date for term work for early winter courses.
January 5, 2026	University reopens.		April examination schedule available online.
	Winter term begins. Full winter and early winter classes begin.	February 16, 2026	Statutory holiday. University closed.
January 9, 2026	Last day for registration and course changes (including auditing) in early winter courses.		
January 16, 2026	Last day for registration and course changes (including auditing) in full winter and late winter courses. Last day to withdraw from early winter courses with a full fee adjustment.		
	Graduate students who have not electronically submitted their final thesis copy to Graduate Studies will not be eligible to graduate in winter 2026 and must register for the winter 2026 term.		

	Deadline for course outlines to be made available to students registered in late winter courses.		Last day to request Formal Examination Accommodations for April full winter, late winter, and fall/winter final examinations from the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfil accommodation requests received after the specified deadlines.
February 16-20, 2026	Winter break, no classes.		
February 21-22, February 28-March 1, 2026	Final examinations in early winter undergraduate courses will be held.		
February 23, 2026	Late winter classes begin.		
February 27, 2026	Last day for registration and course changes (including auditing) in late winter courses.		
March 1, 2026	Last day for receipt of applications for admission to an undergraduate degree program for the fall/winter session from applicants whose documents originate outside Canada or the United States.	March 25, 2026	Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade, in full winter term or fall/winter undergraduate courses, before the official April final examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar).
	Last day for receipt of applications to Bachelor of Architecture, Bachelor of Industrial Design, Bachelor of Information Technology (Interactive Multimedia and Design), Bachelor of Music and Bachelor of Social Work degree programs for the fall/winter session.	April 1, 2026	Last day for graduate students to submit their supervisor-approved thesis, in examinable form to the department.
	Last day for receipt of applications for admission from candidates who wish to be guaranteed consideration for financial assistance (including Carleton fellowships, scholarships and teaching assistantships) administered by Carleton University. Candidates whose applications are received after the March 1 deadline may be considered for the award of a fellowship, scholarship or teaching assistantship (Graduate students only).		Last day for receipt of applications from potential spring (June) graduates.
March 6, 2026	Last day to withdraw from late winter term courses with a full fee adjustment.		Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade, in late winter term undergraduate courses, before the official final examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar).
March 13-15, 2026	Early winter undergraduate deferred final examinations will be held.	April 3, 2026	Statutory holiday. University closed.
March 15, 2026	Last day for academic withdrawal from full winter, late winter, and fall/winter courses.	April 8, 2026	Winter term ends. Classes follow a Friday schedule.
			Last day of full winter, late winter, and fall/winter classes.

	Last day for final take-home examinations to be assigned, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.	<table><tr><th>Date</th><th>Activity</th></tr><tr><td colspan="2">SUMMER TERM 2026</td></tr><tr><td>March 1, 2026</td><td>Last day for receipt of applications for admission to an undergraduate degree program for the summer term.</td></tr><tr><td>April 29, 2026</td><td>Deadline for course outlines to be made available to students registered in early summer and full summer courses.</td></tr><tr><td>May 1, 2026</td><td>Last day for receipt of applications for undergraduate degree program transfers for the summer term.</td></tr><tr><td>May 6, 2026</td><td>Summer term begins. Early summer and full summer classes begin.</td></tr><tr><td>May 12, 2026</td><td>Last day for registration and course changes (including auditing) in early summer courses.</td></tr><tr><td></td><td>Graduate students who have not electronically submitted their final thesis copy to Graduate Studies will not be eligible to graduate in spring 2026 and must register for the summer 2026 term.</td></tr><tr><td>May 15-27, 2026</td><td>Full winter, late winter, and fall/winter term deferred final examinations will be held.</td></tr><tr><td>May 18, 2026</td><td>Statutory holiday. University closed.</td></tr><tr><td>May 20, 2026</td><td>Last day for registration and course changes (including auditing) in full summer courses.</td></tr><tr><td></td><td>Last day to withdraw from early summer courses with a full fee adjustment.</td></tr><tr><td>May 31, 2026</td><td>Last day to withdraw from full summer courses with a full fee adjustment.</td></tr><tr><td>June 1, 2026</td><td>Last day for academic withdrawal from early summer courses.</td></tr></table>	Date	Activity	SUMMER TERM 2026		March 1, 2026	Last day for receipt of applications for admission to an undergraduate degree program for the summer term.	April 29, 2026	Deadline for course outlines to be made available to students registered in early summer and full summer courses.	May 1, 2026	Last day for receipt of applications for undergraduate degree program transfers for the summer term.	May 6, 2026	Summer term begins. Early summer and full summer classes begin.	May 12, 2026	Last day for registration and course changes (including auditing) in early summer courses.		Graduate students who have not electronically submitted their final thesis copy to Graduate Studies will not be eligible to graduate in spring 2026 and must register for the summer 2026 term.	May 15-27, 2026	Full winter, late winter, and fall/winter term deferred final examinations will be held.	May 18, 2026	Statutory holiday. University closed.	May 20, 2026	Last day for registration and course changes (including auditing) in full summer courses.		Last day to withdraw from early summer courses with a full fee adjustment.	May 31, 2026	Last day to withdraw from full summer courses with a full fee adjustment.	June 1, 2026	Last day for academic withdrawal from early summer courses.
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April 23, 2026	All final take-home examinations are due on this day, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.																													
May 1, 2026	Last day for receipt of applications for undergraduate internal degree transfers to allow for registration for the summer session.																													
May 15-27, 2026	Full winter, late winter term, and fall/winter deferred final examinations will be held.																													
June 1, 2026	Last day for receipt of applications for admission to an undergraduate program for the fall/winter session except for applications due March 1.																													
June 15, 2026	Last day for receipt of applications for undergraduate degree program transfers for the fall term.																													

	Last day to request Formal Examination Accommodations for June examinations from the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfil accommodation requests received after the specific deadlines.	June 27, 2026	All final take-home examinations are due on this day, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.
June 11, 2026	Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade in early summer term undergraduate courses before the official examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar).	July 1, 2026	Statutory holiday. University Closed.
		July 2, 2026	Late summer classes begin and full summer classes resume.
		July 8, 2026	Last day for registration and course changes (including auditing) in late summer courses.
		July 15, 2026	Last day to withdraw from late summer courses with a full fee adjustment.
		July 17-19, 2026	Early summer term deferred final examinations will be held.
June 18, 2026	Last day of early summer classes. (NOTE: full summer classes resume July 2.) Classes follow a Monday schedule.	July 19, 2026	Last day for graduate students to submit their supervisor-approved thesis, in examinable form to the department.
	Last day for take-home examinations to be assigned, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.  Last day that can be specified by a course instructor as a due date for term work for early summer courses.	August 1, 2026	Last day for academic withdrawal from full and late summer courses.  Last day to request Formal Examination Accommodations for August final examinations from the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfil accommodation requests received after the specified deadlines.
June 19-20, 2026	No classes or examinations take place.	August 3, 2026	Statutory holiday. University closed.
June 21-27, 2026	Final examinations in early summer courses and mid-term examinations in full summer courses will be held. Examinations are normally held all seven days of the week.		
June 25, 2026	Deadline for course outlines to be made available to students registered in late summer courses.		

August 7, 2026	Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade in late summer and full summer term undergraduate courses, before the official examination period (see examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar).
August 14, 2026	Last day of late summer and full summer classes.  Classes follow a Monday schedule.
	Last day for final take-home examinations to be assigned, with the exception of those conforming to the examination regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.  Last day that can be specified by a course instructor as a due date for term work for late summer and full summer courses.
August 15-16, 2026	No classes or examinations take place.
August 17-23, 2026	Final examinations in late summer and full summer courses will be held. Examinations are normally held all seven days of the week.
August 23, 2026	All final take-home examinations are due on this day, with the exception of those conforming to the examinations regulations in the Academic Regulations of the University section of the Undergraduate Calendar/ General Regulations of the Graduate Calendar.
September 18-20, 2026	Full summer and late summer term deferred final examinations will be held.

## General Regulations (Graduate)

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1. Administration of the Regulations
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12. Thesis Requirements
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### 1. Administration of the Regulations

#### 1.1 General Administration

The following regulations apply to all graduate degree and graduate diploma programs administered by Graduate Studies.

#### 1.2 Student Responsibility

1. It is the student's responsibility to remain informed of all rules, regulations and procedures required by their program and by Graduate Studies. Ignorance of regulations will not be accepted as a justification for waiving such regulations and procedures.

Any exceptions to the rules, regulations and procedures must be approved in writing by the Vice-Provost (Graduate Studies).

Students are responsible for establishing and maintaining contact with their academic unit's graduate supervisor/associate chair (graduate affairs) and, if appropriate, thesis/research supervisor.

2. To receive their degree or graduate diploma students must fulfil:
  - a. all the requirements of the academic unit in which they are registered, including completion of an application for graduation,
  - b. all regulations of Graduate Studies,
  - c. all University regulations,
  - d. all financial obligations to the University.

### 2. Admission Requirements and Eligibility

#### 2.1 General Requirements

Graduates of recognized universities will be considered for admission to Graduate Studies at Carleton University. The University's general policy on admission is outlined below, but all applicants should refer to the departmental websites for details concerning the specific or additional requirements of each academic unit.

#### 2.2 Eligibility

The eligibility of a candidate for admission into one of the graduate programs is based upon:

- the performance of the candidate and the assessment provided by their referees as a measure of the likelihood that the candidate can successfully complete the course of study and research defined by the Senate of the University for the given degree;
- the capacity of the graduate academic unit to provide a program of study and research that would meet the expectations of the candidate as defined in their statement of academic interests and ambitions;
- the availability of a faculty member competent to supervise the candidate's academic program of study and research.

#### 2.3 Qualifying-Year Program

Applicants who do not qualify for direct admission to the master's program may be admitted to a qualifying-year program.

Admission to the qualifying-year program does not imply automatic admission to the master's program. At the end of the qualifying-year program the student will be required to apply for entry into the master's program, at which time the academic unit will determine the student's eligibility to enter the program. If successful, the student will be informed of this decision by the Vice Provost (Graduate Studies).

Applicants who require 3.0 credits or more of additional requirements to enter the master's program must complete a qualifying year.

Credits taken to fulfil the requirements of the qualifying-year program may not be used for credit for the master's degree. Courses taken extra to the program requirements of the qualifying year and which have been successfully completed may be considered for credit towards the master's degree.

#### 2.4 Master's Program

For admission to the master's program, applicants must hold an honours bachelor's degree, or the equivalent, with, normally, B+ or better in the honours subject and B- or better overall. Applicants must also be recommended by the academic unit in which they plan to undertake their studies.

#### 2.5 Doctoral Program

For admission to the Ph.D. program, applicants must ordinarily hold a master's degree, or the equivalent, from a recognized university, normally with an average of B+ or

better in courses (including thesis where applicable) and normally with no grade below B-.

### **2.6 Restriction on Degrees**

Carleton University does not restrict the number of degrees (bachelor's, master's, Ph.D.) that may be taken in any one discipline at Carleton University, but some academic units may restrict the number to two.

### **2.7 Graduate Diploma Programs**

For admission to the diploma programs, applicants are advised to consult with the academic unit offering the diploma.

## **3. Application for Admission**

### **3.1 Accommodation Policy for Students with Disabilities**

Carleton University has a Senate-approved policy on academic accommodation for students with disabilities. For more information, consult the Paul Menton Centre for Students with Disabilities.

### **3.2 Application Forms**

Applications for admission to Graduate Studies should be made through the online applications available at Carleton 360.

A non-refundable application fee (CDN or US funds) is required with each application.

### **3.3 Deadlines**

Normally, students are admitted to commence study in the fall term. However, some academic units may consider applicants to commence in the winter term or the spring/summer term.

For information on the specific deadlines for applications (with or without financial assistance), please visit the online application site at Carleton 360. In the online application site, application deadlines can be found on the left-hand navigation panel under "Program Deadlines."

Students applying to joint programs with the University of Ottawa should note that application procedures, especially deadlines, are different in the two institutions, and they should contact the individual institution for information.

### **3.4 Transcripts**

Official transcripts of the applicant's entire university record must be sent to Graduate Studies. All foreign documents, e.g., transcripts, must be translated into English and be notarized.

### **3.5 Letters of Reference**

All applications must be supported by a minimum of two confidential letters of reference. The total number of referees required for your application depends on the program to which you are applying. A suitable referee is an individual who is fully knowledgeable and aware of your education and abilities. Referees should be academic in nature where possible. Professional referees will only be accepted in situations where the applicant's professional experience is most relevant. You will need to supply the names of your referees, and their email address, in the online application.

## **3.6 Proficiency in English**

Proficiency in English is necessary to pursue graduate studies at Carleton University. All applicants whose first language is not English must satisfy this requirement in one of the following ways:

1. To present an official overall score of 70 on the Canadian Academic English Language (CAEL) Assessment with a minimum score of 60 in each band; or
2. To present an official Test of English as a Foreign Language (TOEFL) score of 580 on the paper-based test (PBT), or an overall score of 86 on the internet-based test (IBT) with a minimum score in each component of: 22 (writing), 22 (speaking), 20 (reading), and 20 (listening); or
3. To present an official overall International English Language Testing System (IELTS) score of 6.5, with a minimum of 6.0 in each band score; or
4. To present an official minimum score of 60 on the Pearson Test of English (Academic), with a minimum score of 60 in each Communicative Skill; or
5. To present an official Duolingo English Test (DET) overall score of 125, with minimum 120 in each integrated sub-score; or
6. To have completed ESLA 1900 at Carleton University with a final grade of B- or higher.

### **Exemptions**

Applicants who meet one of the following criteria are normally not required to submit proof of English Language Proficiency (ELP), unless otherwise required by an individual program:

- most recent degree and transcripts are from a Canadian institution
- present official transcripts to indicate completion of an undergraduate or graduate degree from an educational institution at which English was the primary language of instruction in a country listed on our ELP exemption list

Additionally, applicants may petition Graduate Studies to be exempt from ELP test requirements if they demonstrate:

- Employment for at least three years in a position in which English was the language of business in a country listed on our ELP exemption list

Graduate Studies reserves the right to require further documentation or additional testing if they feel it necessary to demonstrate the required level of English language proficiency.

Note that some programs demand higher levels of competence in English, as specified in their Admissions Requirements in this Calendar.

Applicants whose first language is not English and who do not meet the requirements stated above may be offered admission to a graduate degree program with an English as a Second Language Requirement (ESLR) and/or will

be required to take prescribed remedial course work as a condition of continuing in their program.

## **4. Admissions Procedure**

### **4.1 General Procedure**

All applications for admission will be examined and evaluated by the academic unit in which the applicant wishes to study. All supporting documents (transcripts, letters of reference, etc.) must be received before any application can receive formal consideration.

Recommendations for admission will be forwarded to the Vice Provost (Graduate Studies) for consideration. The official offer of admission comes from the Vice Provost (Graduate Studies). Any correspondence from academic units with regard to acceptance is not official.

### **4.2 Admission Validity for New Students**

The Statement of Standing on Admission is valid **only** for the term stipulated on the form. If the applicant fails to register for this term, their admission and registration eligibility will lapse automatically and they must re-apply for admission.

### **4.3 Revocation of Admission or Registration**

Applications for admission or registration will be revoked if the University determines that the applicant has provided incomplete or misleading information.

## **5. Program Requirements**

### **5.1 General Information**

Program descriptions and details of courses can be found in subsequent sections of this Calendar. Prospective applicants should note particularly the admission requirements, the fields in which advanced study and research may be undertaken, and the program requirements, in addition to the general regulations of Graduate Studies, which are detailed in this section.

### **5.2 Qualifying-Year Program**

Students in the qualifying year will ordinarily register in 5.0 credits at the senior undergraduate level. Of these 5.0 credits, normally no more than 1.0 credit at the 2000-level and no more than 2.0 credits at the 5000-level may be taken. Credits taken to fulfil the requirements of the qualifying-year program may not be used for credit towards the master's degree.

### **5.3 Graduate-level Course Requirements**

Normally, all courses taken for credit toward a master's degree must be at the graduate level. Optionally, up to 20 per cent of the total credits for a degree may be taken at the 4000 level to satisfy elective requirements, with the approval of the program.

Ordinarily, all courses taken for credit toward the Ph.D. degree must be at the 5000- or 6000-level.

Note: the Ontario Universities Council on Quality Assurance requires that no more than one-third of a graduate student's coursework be in classes where undergraduate students predominate. This is called the Two-thirds Requirement. Normally, any graduate course

with a 4000-level cross-list will be counted as a course that does not satisfy the Two-thirds Requirement.

## **5.4 Language Requirements**

Some graduate programs require a reading knowledge of one or more languages other than English. Language requirements will be prescribed by programs according to their regulations and the needs of their students.

Language requirements must be completed within the time limit allowed for the completion of the student's program.

## **6. Transfer of Credit**

### **6.1 Transfer of Credit on Admission**

Graduate courses completed at another institution or at Carleton University that have not been used to fulfil the requirements of another degree program may be accepted in partial fulfilment of Carleton's degree requirements. Credit for such work will be determined in each case by Graduate Studies on the recommendation of the program concerned.

Master's candidates will be permitted to transfer the equivalent of up to 40 per cent of their coursework credit requirements on admission. In addition, if a master's candidate is granted transfer of credit for 40 per cent of their coursework credit requirements, their remaining credits at Carleton must be at the 5000 level.

Doctoral candidates may be given advanced standing for work completed at other universities, but must normally register for a minimum of one year of full-time studies thereafter at Carleton and fulfil the thesis and comprehensive examination requirements. Students admitted with transfer of credits in a Ph.D. program may be required to pass a qualifying examination upon entry.

A candidate who has completed credits as a special student will only be permitted to transfer such credits for degree credit in their program, with the permission of the Vice Provost (Graduate Studies).

Special students enrolled in a graduate level course are subject to the special student regulations outlined in the Undergraduate Calendar.

Up to 1.0 credit of Carleton courses at the 5000 level or higher, completed by a student registered in the final year of study at a Carleton University undergraduate honours degree or equivalent may be considered for advanced standing in a Carleton University master's degree, if the latter offers an Accelerated Pathway.

Students who are considered for participation in an Accelerated Pathway must obtain authorization from the academic unit offering this master's program. All courses taken as part of the Accelerated Pathway must be at the 5000 level or higher. Details are specified in the corresponding "About the Program" section of the Calendar.

### **6.2 Transfer of Credit After Admission**

In the case where a student who is already enrolled in a graduate program at Carleton University is admitted to another graduate program, the rules in 6.1 do not apply.

The admitting program will determine which credits transfer to the new program.

### **6.3 Concurrent Enrolment**

Students may not be concurrently enrolled in multiple master's or multiple doctoral degrees, except in those programs with explicit co-enrolment policies.

## **7. Registration and Course Selection**

### **7.1 The Calendar Year**

Carleton University divides the calendar year into three terms; each term comprises about thirteen weeks of lectures or seminars. The first term of the academic year is designated as the fall term; the second term of the academic year is designated as the winter term; and the third term of the calendar year is designated as the spring/summer term. The precise dates of registration for the fall, winter, and spring/summer terms are specified in the Academic Year section of this Calendar.

### **7.2 Course/Program Approval**

Initial course/program registration and any subsequent course changes must be approved by the program's graduate supervisor/associate chair (graduate affairs). This approval is also required for any undergraduate student who wishes to register in a graduate-level course.

Credit will be granted only for those courses and research activities for which the candidate is formally registered. An unregistered student is not entitled to attend lectures, tutorials, or seminars, and is not entitled to thesis supervision, examination privileges, or access to research facilities. Students will receive no credit for any work completed during a term in which they were not registered.

### **7.3 Student Records Information**

#### **Names**

The University is committed to the integrity of its student records. Students are required to provide on their application for admission their complete legal name. Any requests to change a name, by means of alteration, deletion, substitution, or addition, must be accompanied by appropriate supporting documentation. Upon making application for graduation, students may be asked to provide proof of their name.

#### **Addresses**

Incorrect address information will delay the receipt of awards and student information. Students must update the following address information at Carleton Central:

- permanent or mailing address (used for registration information)
- mailing address (used for all mail during the academic session)
- telephone number for permanent address and for mailing address

#### **Disclosure of Information**

Carleton University is required to disclose personal information such as Ontario Education Numbers, student characteristics and educational outcomes to the Ministry of Advanced Education and Skills Development under s.

15 of the Ministry of Training, Colleges and Universities Act, R.S.O. 1990, Chapter M. 19, as amended. The ministry collects this data for purposes such as planning, allocating and administering public funding to colleges, universities and other post-secondary educational and training institutions and to conduct research and analysis, including longitudinal studies, and statistical activities conducted by or on behalf of the ministry for purposes that relate to post-secondary education and training. Further information on how the Minister of Training, Colleges and Universities uses this personal information is available on the ministry's website.

Further information on the collection and use of student-level enrolment-related data can be obtained from the Ministry of Colleges and Universities website.

In accordance with the Freedom of Information and Protection of Privacy Act (FIPPA), all personal and academic information is considered confidential and will not be disclosed to a third party without the authorization of the person to whom the information pertains. In addition, the University will disclose at the time of collection of personal information the purpose for which that information will be used. Further information is available at the Carleton University Privacy Office.

### **Electronic Communication**

The University provides each student with an email address and uses this as an official channel of communication with the student. A message sent to a student's university-provided email address constitutes an official communication to the student. Students are responsible for monitoring their University email address on a regular basis for as long as they are active in the academic affairs of the university. Requests from students regarding academic or administrative issues must be sent from the student's university-provided email address.

### **7.4 Course Selection**

Students proceeding to a graduate degree or diploma must arrange their program according to the regulations of Graduate Studies and their program.

The course and thesis requirements of each graduate program are organized or defined in units of credits: 1.0 credit is typically made up of three hours of lectures or seminars a week for two terms, or the equivalent; 0.5 credit is typically made up of three hours of lectures or seminars a week for one term, or the equivalent; 0.25 credit is typically made up of three hours of lectures or seminars a week for six weeks, or the equivalent.

### **7.5 Evaluation**

To gain standing in a course, a student must meet the course requirements for attendance, term work, and examinations. Instructors will inform their classes by distributing written notices, before the last day for late registration, of the elements and their weighting that will contribute to the final grade, including (where applicable) attendance, class participation, essays, tests, laboratories, studio-workshops, other course-related work assignments, and final examinations.

## 7.6 Tutorial or Reading Courses

Tutorial or Reading Courses are arranged to allow students to take full advantage of all the resources of the University in areas or fields of a very highly specialized nature. Such arrangements are subject to the approval of the academic unit's graduate supervisor/associate chair (graduate affairs).

## 7.7 Audit Course

Graduate students must have approval from the course instructor and their program graduate supervisor/associate chair (graduate affairs) to audit a course.

- Full-time students are not charged an additional fee.
- Part-time students may only take 1.25 credits per term.

The student should discuss with the instructor the conditions and expectations under which as an auditing student they may be permitted to participate, including attendance and participation in class discussions and group work, and the submission of any material.

A request to change course registration from audit to credit status, or credit to audit, must be received by Graduate Studies no later than the last day to add a course (of that duration) in the term. Students must satisfy all registration requirements to register in the course for academic credit. Students may not retroactively appeal to change the registration status from audit to credit but may subsequently re-register in the course for credit. Graduate students are limited to a maximum of 1.0 course-weight audit registration per program.

## 7.8 Course Numbering System

Each course is designated by an eight-character alphanumeric code. The first four letters indicate the academic unit under whose auspices the course is offered. The four numerical digits identify the specific course. The credit value is indicated in square brackets following the course number.

## 7.9 Status

Full- or part-time status is established at the time of admission to a program. Graduate students admitted and registered as full-time students will be required to continue in and complete their program as full-time students and will be assessed full-time fees for the duration of their program. Graduate students admitted and registered as part-time students will be required to continue and complete their program as part-time students and will be assessed part-time fees for the duration of their program.

A part-time graduate student will not register in more than 1.25 credits per term, including audit courses.

## 7.10 Change of Status from Full- Time to Part-Time

Students who have valid reasons for changing status from full-time to part-time prior to registration for a term may apply for permission by:

- writing to Graduate Studies stating the reason(s) for seeking exemption from the full-time registration requirements stated in 7.9

- completing a Change of Registration Status Form, accompanied by a statement from the departmental graduate supervisor/associate chair (graduate affairs) - and the thesis supervisor, if applicable - in support of their request.

It is understood that such a status change will be granted only in exceptional cases (e.g., for medical reasons.)

Exemptions are normally granted for a term.

## 7.11 Off-Campus Research

Graduate students may participate in a program or research at another institution or in the field. Written permission for off-campus study or research must be obtained prior to departure, through the graduate academic unit in which the student is registered. Registration must be maintained while approved off-campus activities are completed.

## 7.12 Cotutelle

Doctoral students may arrange to undertake a cotutelle in which they will complete the requirements of a Ph.D. program in both their home university and a partner university in another country.

Under such an arrangement, doctoral students conduct their dissertation research collaboratively, sequentially, and for roughly equal amounts of time in both universities. They are supervised in their dissertation research by a faculty member from each of the universities. The dissertation is then examined by a committee whose members are drawn from both institutions.

Students who undertake a cotutelle are not subject to general regulation 7.11.

Requests for permission to undertake a cotutelle must be made in accordance with Carleton University's Cotutelle Policy. More information can be found in the official Carleton University Cotutelle Policy.

## 7.13 Dual Master's Degree

Master's students may undertake a Dual Master's Degree pathway in which they would complete the requirements of a master's program in both their home university and a partner university.

Students who undertake a Dual Master's Degree pathway are not subject to general regulation 7.11.

Requests for permission to undertake a Dual Master's Degree pathway must be made in accordance with Carleton University's Dual Master's Degree Policy. More information can be found in the official Carleton University Dual Master's Degree Policy.

## 7.14 Inter-University Cooperation in Graduate Instruction

Under certain circumstances, it is permissible for a student admitted to a graduate degree program and registered at one university to follow an approved graduate-level credit course at another university. All interested students should consult the chair/director of their academic unit prior to registration in order to obtain further information on procedures and conditions of eligibility. In order for

this procedure to be valid, students must be officially registered at their home institution.

### **7.15 University of Ottawa**

Carleton University and the University of Ottawa have developed a number of joint programs at the graduate level. Where formal joint programs do not exist, a graduate student may be permitted to follow up to 2.0 credits at the 5000- or 6000-level at the University of Ottawa. Reciprocal arrangements exist among academic units at both universities. All interested students should consult their program graduate supervisor/associate chair (graduate affairs), prior to registration, in order to obtain further information on particular departmental conditions of eligibility and procedures. Students must be officially registered at their home institution.

## **8. Continuous Registration**

### **8.1 Loss of Status**

Any student who remains unregistered in their degree program for three continuous terms (twelve months) will lose their graduate status.

### **8.2 Continuous Registration in Thesis, Research Essay, or Independent Research Project**

Any student (full-time or part-time), after initial registration in a thesis, research essay or independent research project, must maintain this registration in all successive terms (including the term in which the student is examined) until their thesis, research essay or independent research project is completed. Completion means submission of a final grade to Graduate Studies after modifications/revisions. Students should note that approval to register in the thesis, research essay or independent research project is given on the understanding that the student will be in regular contact with their supervisor, and that thesis research will be actively pursued in each term of registration.

Note: a Regularly Scheduled Break as described for immigration purposes does not supersede this requirement.

### **8.3 Deposit of Thesis**

In the case of a thesis, registration must be maintained until the thesis is electronically deposited with Graduate Studies. Should a thesis not be deposited with Graduate Studies by the last day for late registration in a given term, the student will be required to register for that term.

### **8.4 Reinstatement**

Students whose files have been closed as a result of failure to observe continuous registration requirements or who have lost their status for non-registration for three continuous terms must apply for reinstatement within the term they lose their status if they wish to continue their studies. If reinstated, students must pay a reinstatement charge plus the equivalent of 1.0 credit tuition fees for each term in which they failed to register, as well as for the current term of registration.

### **8.5 Exemption from Registration**

Students who have valid reasons for not registering for a term may apply for permission to remain unregistered by:

- writing to the Vice Provost (Graduate Studies) prior to the registration period stating the reasons for seeking exemption from registration;
- completing an Exemption from Registration form accompanied by a statement from the program graduate supervisor/associate chair (graduate affairs) - and from their thesis supervisor, if applicable - confirming that they will not be on campus for the term, will not use any University facilities (library, laboratories, computer centre, etc.), or receive any supervision, including supervision through correspondence;
- while exempt from registration, students will not be registered in a program, nor will they be required to pay fees for this period. They will not be eligible to receive awards administered by Carleton University. In the case of external awards, the regulations of the particular granting agency will apply.

It is understood that such an exemption from registration will be granted only in exceptional cases (for example, medical reasons).

Exemptions are normally granted for one term.

When exemption from registration for a term or terms has been approved by the Vice Provost (Graduate Studies), this period will be exempt from the overall time limit for completion of the program.

An administrative fee per term for an exemption will be charged to the student's account.

### **8.6 Off-Campus Registration**

Students who have been permitted to study off campus while registered full-time at Carleton must register using Carleton Central Web Registration.

### **8.7 Course Changes**

A course change is defined as the addition or deletion of one or more individual courses by a registered graduate student. This is the acceptable procedure for revising or correcting a graduate student's registration. Some course changes must be approved by the student's program graduate supervisor/associate chair (graduate affairs).

The deadline dates for course changes are stipulated in the Academic Year section of this Calendar.

### **8.8 Withdrawal**

Graduate students wishing to terminate their registration in a graduate program (that is, drop all courses) must notify their department in writing of their intent to withdraw.

#### **Withdrawal Credit**

When a student officially withdraws, a full refund will be issued if notification is received within the refund period. Students are encouraged to examine the financial and award implications of withdrawal. Refund deadline information is available at the Business Office.

#### **Mid-Term Transfer of Program**

There is no procedure at Carleton University for direct "mid-term" transfer from one graduate program to another. Similarly, there can be no direct transfer to or from undergraduate or special student status. Any candidate

who elects to change programs after registration (before the last day of late registration) will be required to withdraw from the first program and then register in the second.

## 9. Examinations and Term Work

### 9.1 General Remarks

Final examinations in courses will be held at the times indicated in the academic schedule. Graduate students must obtain grades that meet the standards outlined in Section 11, Academic Standing, and that satisfy the specific requirements of the program concerned.

### 9.2 Examination Regulations

Students writing tests and examinations should be aware of the rules governing examination conduct. These rules include those listed in the Academic Integrity section of this Calendar and information about policy and procedures for writing examinations distributed at the final examination.

For examinations scheduled during the official examination period, it may be necessary to schedule examinations during the day for classes held in the evening and vice versa, or on Saturday and Sunday.

All tests and examinations are subject to the following rules:

1. Tests or examinations given in class may not exceed the time allotted for the class.
2. The schedule for any term tests or examinations to be held outside class time must be communicated in the course outline. Students who are unable to write during this scheduled time must be accommodated before the last day of classes.
3. If there is a final examination in the summer term, it will be held during the official examination period;
4. If there is a final examination or an end-of-term examination in a multi-term course, this examination will be held in the official examination period;
5. No summative tests or final examinations may be held during the last two weeks of fall or winter terms, or during the last week of each half of the summer term;
6. Formative tests or examinations may be held during the last two weeks of classes of fall or winter terms, or during the last week of each half of the summer term, provided they do not total more than 15% of the final grade. The purpose of formative tests or examinations is to provide feedback to students on a component of the course content.
7. No tests or examinations may be held between the end of classes in a term and the beginning of formally scheduled examinations;
8. Normally, final take-home examinations in any term will be assigned on or before the last day of classes and are due on the last day of the official examination period. Final take-home examinations not set according to this normal practice must be formally scheduled by Scheduling and Examination Services and are subject to overload rules. In all cases

the rules for take-home examinations must be well communicated to students by course instructors.

9. Students are not required to write with an exam conflict (defined as two examinations scheduled at the same time) nor in an exam overload, defined as (i) 3 or more examinations scheduled in 3 consecutive time slots, (ii) 4 or more examinations scheduled in 5 consecutive time slots, or (iii) 5 or more examinations scheduled in 7 consecutive time slots, where a time slot refers to the morning, afternoon, or evening time slot on an exam day.

### 9.3 Special/Deferred Final Examinations

Students who are unable to write a final examination because of extenuating circumstances as defined in the Academic Consideration Policy may apply for accommodation. Normally, the accommodation for a missed final examination will be granting the student the opportunity to write a deferred examination. In specific cases when it is not possible to offer a deferred examination, and with the approval of the Dean, an alternate accommodation may be made.

The application for a deferral must:

1. be made in writing to the Course Instructor no later than three (3) working days after the original final examination or the due date of the take-home examination; and
2. be fully supported by appropriate documentation. In cases of short-term extenuating circumstances normally lasting no more than five (5) days, students must include the University's **Self-Declaration Form**. Additional documentation is required in cases of extenuating circumstances lasting longer than five (5) days and must be supported by a medical note specifying the date of onset of the illness, the (expected) date of recovery, and the extent to which the student was/is incapacitated during the time of the examination. The University's preferred Medical Certificate Form can be found here.

### Missed Deferred Examinations

Students will not be given a deferral of a deferred examination.

Students granted a deferred final examination who are then unable to write the deferred final examination will receive the earned grade in the course (which may be an F).

Students granted a deferred final examination who are then unable to write the deferred final examination due to properly documented personal or medical conditions may appeal to receive the notation of Withdrawn (WDN) for the course as assigned by the appropriate appeal committee.

Students may not petition for a WDN if they attended the deferred examination but did not complete it for personal or medical reasons, unless the circumstances satisfy the requirements for Early Departure from Final Examinations below. The self-declaration form is not sufficient documentation for this application.

**NOTE:** If a student would be unable to pass the course as specified in the course outline, regardless of the result of a final examination, a grade of F may still result. If a student is passing the term work and is able to pass the course as specified in the course outline, based on the results of a final examination, then a withdrawn (WDN) may be granted.

Students who have obtained approval for a deferred examination in a Carleton University Online course will have access to course materials after the end of the academic term of the original course.

Deferred final examinations in graduate courses are scheduled by the course's instructor.

### **Early Departure from Final Examinations**

Students are expected to assess their medical situation/ability to write an examination prior to entering the examination room. Students who do not write a final examination because of extenuating circumstances/emergency beyond their control may apply to write a deferred examination.

Students are expected to complete a final examination once begun. If the student experiences a significant deterioration of health while the examination is in progress, it may be possible to submit a petition to apply to write a deferred examination.

A significant deterioration during an exam is a situation whereby the student requires immediate and/or emergency medical attention. In such circumstances, a student will be required to seek appropriate documentation to confirm that the medical situation caused significant, acute symptoms during the examination that completely prohibited the student from completing the exam, describing the specific impacts on the student's ability to continue the exam.

The student must then petition the course instructor within three (3) business days of the examination with appropriate supporting documentation. The self-declaration form is not sufficient documentation for this application.

Minor illnesses and ongoing chronic illnesses under medical management will normally not be considered valid grounds for granting a deferred final examination.

### **9.4 Deferred Term Work**

In some situations, students are unable to complete term work because of illness or other circumstances beyond their control, which forces them to delay submission of the work.

1. Students who claim illness, injury or other extraordinary circumstances beyond their control as a reason for missed term work are held responsible for immediately informing the instructor concerned and for making alternate arrangements with the instructor and in all cases this must occur no later than three (3.0) working days after the term work was due.
2. Normally, any deferred term work will be completed by the last day of term.

3. In cases where the term work is due on the last day of classes, the alternate arrangement must be made no later than three days after the last day of classes.
4. Normally, any deferred term work will be completed by the last day of term. In the event that the altered due date must extend beyond the last day of classes in the term, the instructor will assign a grade of zero for the work not submitted and submit the student's earned grade accordingly; the instructor may submit a change of grade at a later date.
5. Term work cannot be deferred by the Registrar or Graduate Studies.
6. In cases where a student is not able to complete term work due to illness or injury for a significant period of time/or long term, the instructor and/or student may elect to consult with the Registrar's Office (undergraduate courses) or Graduate Studies (graduate courses) to determine appropriate action.
7. If a student is concerned the instructor did not respond to the request for academic accommodation or did not provide reasonable accommodation, the student should consult with the department/school/institute chair/director. If a mutually agreeable accommodation to complete course requirements prior to the course grade submission deadline cannot be achieved, the Associate Dean will become involved. If academic accommodation is not granted, and the student receives word **after** the academic withdrawal deadline, the student may submit a petition to the Registrar's Office (undergraduate courses)/Graduate Registrar (graduate courses) for a final grade of WDN (Withdrawn) in the course(s). If academic accommodation is not granted, and the student receives word **prior** to the academic withdrawal deadline, the student may elect to withdraw from the course(s).
8. Furthermore, if academic accommodation is granted, but the student is unable to complete the accommodation according to the terms set out by the instructor as a result of further illness, injury or extraordinary circumstances beyond their control, the student may submit a petition to the Registrar's Office (undergraduate courses)/Graduate Studies (graduate courses).

### **9.5 Master's Examinations**

In addition to any examination which may be required in individual courses, or comprehensive examinations in required fields of specialization, a master's candidate who is writing a thesis will be expected to undertake an oral defence of the thesis. When the degree is taken by course work, a comprehensive examination may be required. It is important to note that individual programs may have specific requirements.

### **9.6 Doctoral Examinations**

Doctoral candidates may be asked to pass a qualifying examination at the beginning of their residency at Carleton University.

A comprehensive examination covering prescribed fields will normally be undertaken at least one year prior to the

thesis defence. This examination (oral or written, or both) may include any material considered fundamental to a proper comprehension of the field of study.

After the thesis has been received and accepted for examination, a final oral examination on the subject of the thesis and related fields will be held.

The thesis examination must be conducted according to the principles and practices prescribed by Graduate Studies.

### 9.7 Unsatisfactory Comprehensive Grades

If the comprehensive examination is graded Unsatisfactory, the program may permit the candidate to repeat the examination. If the comprehensive examination is graded Unsatisfactory for a second time, students must make an appeal to remain in their program through their program graduate supervisor/associate chair (graduate affairs) to Graduate Studies.

## 10. Grading System

### 10.1 Letter Grades

Standing in a course is determined by the course instructor, subject to the approval of the faculty dean. Standing in courses will be shown by alphabetical grades. The system of grades used, with corresponding grade points and the percentage conversion is below. Grade points indicated are for courses with 1.0 credit value. Where the course credit is greater or less than one credit, the grade points are adjusted proportionately.

Grade	Point Equivalence	Percentage Conversion
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	less than 50

In cases where the final examination is not written and was not explicitly a requirement to successfully complete the course, the cumulative grade earned on term work without the missing examination will be assigned.

If the grade conversion deviates from the percentage conversion presented above, the faculty member must notify the class in the course outline.

### 10.2 Other Grading Notations

Other grades and notations in current use by the university are as follows:

#### Notation Description

AUD	AUD. No Academic Credit, no impact on CGPA. Audit indicates the course was taken for interest and not for academic credit.
CEX	Current International Exchange. An interim notation.
CLP	Current Letter of Permission. An interim notation.
CTN	Continuing. No academic credit and no impact on the CGPA. Assigned by the Registrar's Office to the first half of a course taught consecutively over two terms.
CUR	Current registration. An interim notation assigned by the Registrar's Office to indicate the student is currently registered in the course.
DEF	Deferred Final Examination and/or final course work. An interim notation administratively assigned by the Registrar's Office upon approval of a request to write a deferred final examination or defer submission of final course work. DEF must be replaced by a final grade within the prescribed time or be replaced with F.
F	Failure. The grade of F is assigned when the student has failed to meet the conditions of "satisfactory performance" defined in the Course Outline. F carries 0.0 grade points.
GNA	Grade not available. An interim notation administratively assigned by the Faculty when a grade is not available, and must be replaced with a final grade.
IP	In Progress – a notation (IP) assigned to a course by a faculty member when: At the undergraduate level, an undergraduate thesis or course has not been completed by the end of the period of registration. At the graduate level, a graduate thesis, research essay, independent research project or comprehensive examination has not been completed by the end of the period of registration. The IP notation may also be used at the graduate level when a research seminar has not been completed by the end of the period of registration provided the research seminar has been approved as being eligible for the use of this notation. In the case of re-registration in any of the above courses, the IP notation will remain; a final grade will normally be assigned in the final period of registration. Where there is no re-registration in any of the above courses, the IP notation must be replaced with an appropriate notation or grade within the prescribed time period, or be replaced by a notation of WDN.
SAT	Satisfactory performance in an ungraded program requirement, option or course taken on Letter of Permission or International Exchange. SAT has no impact on the CGPA calculation.
UNS	Unsatisfactory performance in an ungraded program requirement, option or course taken on a Letter of Permission or International Exchange. UNS has no impact on the CGPA calculation.

WDN	<p>Withdrawn. Students may withdraw on or before the academic withdrawal deadline (noted in the Academic Year section of the Calendar).</p> <p>No academic credit, no impact on the CGPA. WDN is a permanent notation that appears on the official transcript for students who withdraw after the full fee adjustment date in each term (also noted in the Academic Year section of the Calendar).</p>
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### 10.3 Release of Grades

Students may access grades through the Carleton Central Student registration system as soon as the grades are available after the end of the fall and winter terms of the fall/winter session and after the end of the spring/summer session.

### 10.4 Change of Grade

Final grades are posted after grades are approved. Once posted, final grades may only be changed through informal or formal appeals of grade processes (see General Regulation 15 of the Graduate calendar).

Any instructor-initiated changes beyond the formal and informal appeal process must be completed by the instructor and approved by the faculty dean, or designate within 6 months of the last day of the exam period.

Any changes beyond this 6 month period must be initiated after consultation with the faculty dean or designate.

Unless an appeal has been initiated prior to the awarding of a degree, grades that have been used towards the awarding of a degree are not eligible for a change of grade.

### 10.5 Transcripts

Students are advised that no official transcripts will be released by the University until all outstanding accounts have been paid.

## 11. Academic Standing

### 11.1 Qualifying-Year

Students should note that admission to the master's program from qualifying year is governed by the admission requirements in Section 2, Admission Requirements and Eligibility.

### 11.2 Graduate Diploma Programs

#### Type 2 Graduate Diplomas

Students enrolled in Type 2 (concurrent) graduate diplomas are governed by the academic standing regulations of their primary degree (master's or doctoral).

#### Type 3 Graduate Diplomas

Type 3 (stand-alone, direct entry) graduate diplomas are governed by master's degree academic standing regulations.

### 11.3 Master's Programs

A grade of B- or better must normally be obtained in each course credited towards the master's degree. A candidate may, with the support of the departmental graduate supervisor/associate chair (graduate affairs) and the approval of the Vice Provost (Graduate Studies), be

allowed a grade of C+ in 1.0 credit. Some programs do not permit the C+ option and apply a B- minimum rule.

### Full-Time Continuation

Full-time master's students who fail to achieve a weighted GPA of 7.0 after two terms of study, or to maintain it subsequently, will be required to withdraw from the program. In the event of special or extenuating circumstances, the student may apply through the program graduate supervisor/associate chair (graduate affairs) to the Vice Provost (Graduate Studies) for permission to continue in the program.

### Part-Time Continuation

Part-time master's students who fail to achieve or maintain a weighted GPA of 7.0 after completing 2.0 credits, or to maintain it subsequently, will be required to withdraw from the program. In the event of special or extenuating circumstances, the student may apply through the program graduate supervisor/associate chair (graduate affairs) to the Vice Provost (Graduate Studies) for permission to continue in the program.

### 11.4 Doctoral Programs

Doctoral students must obtain a grade of B- or better in each course credited towards the degree.

### 11.5 Doctoral Progress Reporting

Doctoral students must make consistent progress in their studies and must document their progress by completing an annual progress report that details the previous year's achievements and the objectives for the following year. Students must complete their progress report in consultation with their supervisor and committee. Reports must be submitted to the program graduate chair/director or equivalent for review and approval.

In the event that progress is deemed unsatisfactory, the program director or equivalent may recommend to the Vice Provost (Graduate Studies) that the student be required to withdraw.

### 11.6 Religious Accommodation

Carleton University accommodates students who, by reason of religious obligation, must miss an examination, test, assignment deadline, laboratory, or other compulsory event.

Accommodation will be worked out directly and on an individual basis between the student and the instructor(s) involved. Students should make a formal request to the instructor(s) in writing for alternative dates and/or means of satisfying requirements. Such requests should be made during the first two weeks of any given academic term, or as soon as possible after a need for accommodation is known to exist. Instructors will make reasonable accommodation in a way that shall avoid academic disadvantage to the student.

Students unable to reach a satisfactory arrangement with their instructor(s) should contact the Office of Equity and Inclusive Communities. Instructors who have questions or wish to verify the nature of the religious event or practice involved should also contact this office.

## 12. Thesis Requirements

Guidelines for the preparation of graduate theses and information on the procedures for examination of graduate theses are available at the Graduate Studies website.

### 12.1 General Remarks

The thesis is a major requirement of many master's and all doctoral programs and, in conjunction with the research for it, makes up at least one half of the time normally required for the program. The thesis must be expressed in a satisfactory literary form, consistent with the discipline concerned, and must display a scholarly approach to the subject and thorough knowledge of it. A critical review of previous work related to the subject should usually be provided.

Students will not be permitted to submit a thesis for which they have previously received a degree; however, with the permission of the Vice Provost (Graduate Studies), they may incorporate into the thesis material that was included in a previous thesis.

### 12.2 Master's Thesis

The master's thesis should exhibit a competence in the research process by applying an existing body of knowledge in the critical analysis of a new question or of a specific problem or issue in a new setting. On the basis of that conceptual understanding and methodological competence, it should demonstrate at least one of the following:

1. the development and support of a sustained argument in written form
2. originality in the application of knowledge

### Oral Examinations

Students are required to undertake an oral examination of the thesis. Please refer to Thesis Specifications, Section 12.5, Master's, for submission deadlines. The master's thesis will be examined by a board consisting of at least four members, including the thesis supervisor, the chair of the department concerned, an examiner from a department other than that of the candidate, and one additional member from the department concerned. The chair of the department concerned will announce the constitution of the examination board. Consult the Thesis Examination Policy for details.

### Thesis Weight

Thesis weight must be identified at the time of admission. A change in the thesis weight at a later date requires the approval of the Vice Provost (Graduate Studies).

### 12.3 Doctoral Thesis

The doctoral dissertation must report, in an organized and scholarly fashion, the results of original research. The thesis must be a contribution to knowledge, and must demonstrate the ability to conceptualize, design and implement research for the generation of new knowledge, applications, or understanding at the forefront of the discipline, and to adjust the research design or methodology in the light of unforeseen problems.

### Oral Examinations

The thesis must be defended successfully at an oral examination. Please refer to Thesis Specifications, Section 12.5, Doctoral, for submission deadlines. The doctoral thesis will be examined by a board consisting of at least five members, including the thesis supervisor, an examiner from a department other than that of the candidate, the members of the candidate's advisory committee, and an external examiner who is a recognized authority on the subject of the thesis. The Vice Provost (Graduate Studies), the dean of the candidate's Faculty, and the chair/director of the candidate's department, institute or school are ex officio members of the board. The Vice Provost (Graduate Studies) appoints an independent chair of the board, who is not from the candidate's department, institute or school.

The Vice Provost (Graduate Studies) will announce the constitution of the examination board; both it and the thesis examination process are defined by the Thesis Examination Policy.

### Thesis Weight

Thesis weight must be identified at the time of admission. A change in the thesis weight at a later date requires the approval of the Vice Provost (Graduate Studies). The work of each Ph.D. candidate will be assisted by an advisory committee of faculty members who will aid the candidate in their preparation for the final comprehensive examination, and assist in the evaluation of the thesis and its oral examination.

### 12.4 Integrated Thesis Policy

Many disciplines, especially in engineering and the sciences, accept a thesis consisting of student work based on published papers, conference proceedings, or papers awaiting publication. Known as the 'integrated article,' 'manuscript,' 'sandwich,' or 'chapter' thesis, this type of thesis contrasts with the monograph thesis traditionally offered for examination. However, the same quality and ethical standards apply to each thesis type and the authority of the Thesis Examination Committee remains the same for both. Each individual academic unit decides the thesis format(s) suitable for its discipline.

#### A. Criteria for Integrated Article Thesis

The integrated article thesis is acceptable under the following conditions:

- The integrated thesis must consist of a coherent account of a unified research project. It is not a collection of loosely connected papers. The student will provide a document that locates a body of work within the context of existing theoretical and methodological debates in the literature, identifies the contributions of the thesis research to that literature and indicates potential directions for further research based upon knowledge gained through the thesis research.
- The thesis must be original and present the student's own work completed during the program of study for which the thesis is being submitted. The student should be the sole author or principal author of any included materials. The student must have played a major or sole role in setting up and conducting the research, obtaining data and analyzing results, as well

as preparing and writing the documents submitted for examination. In the case where co-authored articles are included, the rules and procedures itemized in "Section D" below must be adhered to.

- The thesis must contain a statement from the thesis supervisor verifying the student's contribution to the originality of the material presented in the thesis and clarifying in what way the included materials became part of the thesis.

## **B. Integrated Article Thesis Format**

Published articles which do not follow the traditional thesis formatting rules may be included as thesis chapters.

The body of an integrated article thesis should contain the following chapters:

### **• Abstract**

The abstract includes a brief description of the subject matter and summarizes the main themes presented in the thesis.

### **• Preface**

The preface must provide full bibliographical details for each article included in the thesis, as well as whether the article is reproduced in whole or in part.

In the case of a partially reproduced article, the preface must include a description of the changes that have been made to the published version. Use of copyrighted material must be acknowledged in the preface and tables and figures must have "Reprinted with permission of..." in their captions. See below "Section C" on copyrighted material. Students must also indicate how others are to cite material from this thesis. In the case where the thesis includes co-authored material, see rules and procedures for co-authored material in "Section D", below.

### **• Introductory Chapter /Literature Review**

The introductory chapter provides a comprehensive review of the literature that establishes the student's familiarity with relevant work in the field; sets out the objectives of the thesis; places the research into the larger context of the candidate's discipline; and provides an overall thematic cohesiveness of the chapters (research papers) to the reader.

### **• Methods Chapter**

The methods chapter should include an overview of the methodological approach used in the thesis and the common methodological assumptions or techniques that link the data chapters into a cohesive entity. A crucial feature of the scientific method is repeatability. The thesis must thus contain detailed descriptions of the experimental procedures followed to obtain results, so as to ensure that readers may be able to test the validity of research outcomes. In cases where such detailed descriptions do not appear in the integrated chapters, they must be included in the Methods Chapter. It is also acceptable to include this information in an Appendix, if the explanation is so protracted and tedious that it detracts from the readability of the main body of the text.

### **• Data (Research Paper) Chapters**

Normally, 3 or 4 articles form the body of the thesis and are divided into separate chapters. This work must be smoothly integrated into the flow of the thesis to produce a unified and appropriately sequenced argument. To do so may require some additions, deletions or re-writing of the original material. In cases where a published article is directly reproduced as a chapter without reformatting, additional pages at the beginning and the end of the chapter should be added to ensure logical and coherent transition between chapters.

### **• Conclusion**

The conclusion chapter summarizes and critiques the research topic as a whole, offers an analysis of the limitations existing in the study and suggests potential areas of future research based on the thesis findings.

### **• Bibliography and References and Citations**

Bibliographic format should be appropriate to the discipline. Methods of handling and listing references in the text vary. Because the body of the thesis contains chapters representing a separate piece of published work, each chapter may contain its own bibliography. Depending upon the situation, the literature review and/or summary chapter may also contain bibliographies to reflect individual citations made in those sections. Tables and figures should be included in appropriate chapters and numbered consecutively using the chapter number e.g. Chapter 2 would be numbered Table 2-1, 2-2 and so on. This practice avoids the table number repetition that may occur if separate published article material is used.

### **• Appendices**

Appendices are optional. Normally, appendices are included to provide information that detracts from the readability of the main body of the text or to present data or information used in the thesis but not directly obtained by the thesis author. Lengthy tables, detailed explanation of laboratory procedures, and computer programs may be included in the appendices.

## **Texts from Prior Theses**

A prior graduate thesis or sections of a prior graduate thesis cannot be included as an article in the Ph.D. thesis. The goal is to present a coherent body of research rather than a collation of every piece of work that the student has produced. In the case where doctoral research is closely related to work already completed at the master's level, students will be requested to include a statement attesting to the fact that no text in the thesis has appeared in another thesis.

## **C. Copyrighted Materials and Permissions**

Use of copyrighted material must be acknowledged in the Preface and tables and figures must have "reprinted with permission of..." in their captions.

If the student wishes the work to include text that has already been published as a journal article or book chapter, the student must obtain permission from the publisher and include it along with the thesis as a separate document. Note that Library and Archives Canada request that permissions be submitted separately with the thesis.

In a case where a thesis includes papers co-authored by the student and others, the thesis must state explicitly who contributed to such work and the nature and extent of that contribution. The candidate must obtain permission from the co-authors to use this work and provide a statement of permission along with the thesis as a separate document. Each co-author must include in the statement of permission the extent of her/his contribution to the article(s) included in the thesis. See Section D below.

#### **D. Rules and Procedures for Integrated Theses which Include Co-Authored Material**

Co-authored publications are a common practice in many disciplines. The thesis, however, must represent the work of the student submitting it for credit. It is thus imperative that rules and procedures be followed to ensure that a student submitting an integrated thesis which includes co-authored article(s) be examined and evaluated on their own contribution to the collective publication(s).

##### **Preface and additional documents**

The preface must include a statement from the supervisor and the student indicating that the student was fully involved in setting up and conducting the research, obtaining data and analyzing results, as well as preparing and writing the material presented in the co-authored article(s) integrated in the thesis. There must also be a statement that clearly distinguishes the specific contributions of the student from those of all other collaborators or co-authors. The supervisor must include a statement which confirms the information provided by the student in the preface. Additionally, each co-author must confirm in a signed statement the extent of her/his contribution to the co-authored article(s) included in the thesis. These statements must be provided along with the thesis as separate documents. The objective of this requirement is to assure examiners that there has been full disclosure of collaborative activity. In providing these statements, all parties involved must take into consideration the rules and regulations of Carleton University's Academic Integrity Policy.

##### **Multiple use of the same co-authored article(s)**

As a general rule, the same text from a co-authored published article should not be used in more than one thesis. In the case of students who have worked collaboratively on projects leading to a published article which comprises different sections of text with different single-author attribution, the relevant section(s) of the article may be included in different theses. In the case of a wholly collaborative article where individual contributions cannot be determined, the same article may be used in more than one thesis, but to a maximum of three theses. In cases where the same article appears in more than one thesis, each thesis must include a statement from all students and all supervisors involved confirming that all students collaborated equally in the production of the article(s). These statements must be provided along with the thesis as separate documents.

Issues of copyright must be addressed by the student as outlined in the copyright section above. The candidate

must obtain permission from the co-authors to use this work and include a statement of permission along with the thesis as a separate document. Each co-author must include in the statement of permission the extent of her/his contribution to the article(s) included in the thesis.

#### **E. Integrated Article Thesis Examinations**

Article publication or publication does not supersede the authority or responsibility of the Examination Committee to evaluate the thesis during the examination process and to recommend or require changes.

Thesis examination rules/policies and procedures are not changed to accommodate the integrated article thesis.

The oral examination concentrates on testing the candidate's knowledge as much as on questioning the written document.

##### **12.5 Deadlines**

Consult **The Academic Year** page for submission deadlines for master's and doctoral theses. Theses must be supervisor-approved and in examinable form. Should the department require further approvals, these must be obtained prior to the submission deadline.

##### **12.6 Specifications**

- Prior to the examination, the candidate must submit the examinable version of the thesis, which must comply with the departmental requirements governing the form of the thesis, including methods of bibliographical entry and the use of diagrams and tables.
- The examinable version of the thesis must be accompanied by a suitable abstract. The abstract of a master's thesis should not exceed 150 words, while the abstract of a doctoral thesis may be up to 350 words in length.
- Regulations regarding style, pagination, certification, acceptance, abstracts, reproduction, electronic dissemination, and the constitution of the examining board will be prescribed by Graduate Studies.

#### **Master's Thesis**

Students are expected to notify their supervisor and the chair of the department at least two weeks in advance of the date on which they intend to submit the completed thesis. The examinable thesis must be submitted to the department at least four weeks in advance of the intended date of examination. The thesis examination and defense will then be scheduled, and the date will be announced at least two weeks in advance.

#### **Doctoral Thesis**

The candidate is expected to notify their supervisor and the chair of the department at least two weeks in advance of the date on which they intend to submit the completed thesis. The candidate is then expected to submit the examinable thesis to the department at least six weeks in advance of the intended date of examination. The thesis examination and defense will then be scheduled, and the date will be announced by the Vice Provost (Graduate Studies) at least four weeks in advance. The academic unit must forward the examinable thesis to Graduate

Studies at least four weeks in advance of the actual date for the examination and defense.

### **12.7 Licence to the University and to Library and Archives Canada**

In the interest of facilitating research by members of the Carleton community and by interested outsiders, and in consideration of their having been accepted as a graduate student at Carleton, the author of a thesis or dissertation submitted in partial fulfilment of the requirements for an advanced degree shall grant to the University a license to disseminate the thesis electronically, solely for the purpose of private study and research.

Students wishing to deposit their thesis with Library and Archives Canada and participate in electronic distribution of their research are advised to review the revised procedures available online at Library and Archives Canada.

It is understood that the author retains other publication rights, and that neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

### **12.8 Withholding of Thesis Deposition**

If, at the time of submitting their thesis, students elect to protect any rights to immediate commercial publication, or to obtain a patent which may arise from their research, or to keep their thesis out of circulation, they may apply in writing to the Vice Provost (Graduate Studies) requesting that the thesis be withheld from deposit in the library:

- for an additional period of three months, without reason
- for each additional period of six months, with reason (total period of restriction not to exceed two years).

A request for extension of the restriction must be submitted one month prior to the termination of the approved s period. Justification for extension of the restriction is required.

### **12.9 Degree Completion**

A registered candidate who completes their degree requirements by depositing the thesis prior to the last day for withdrawal in any term (as specified in the academic schedule) is required to request formal withdrawal for refund purposes if they anticipate any refund of fees. This applies to thesis or research essay registration.

## **13. Time Limits for Program Completion**

### **13.1 General Remarks**

There are maximum time limits for the completion of programs. Students may also be subject to time constraints prescribed by individual programs to ensure orderly and timely progress through their programs.

### **13.2 Master's Program**

#### **Full-time**

All master's students admitted as full-time students must normally complete their degree requirements within two calendar years after the date of initial registration, unless their program states otherwise and regardless of any subsequent change of status to part-time. Terms of non-

registration are equated to full-time registration terms when calculating the overall time to program completion.

#### **Part-time**

All master's students admitted as part-time students must normally complete their degree requirements within six calendar years after the date of initial registration, unless their program states otherwise. Terms of non-registration are equated to part-time registration terms when calculating the overall time to program completion. A change of a student's status from part-time to full-time status will result in a pro-rated reduction in the required time to completion for each subsequent term of full-time study.

Failure to complete the program within the prescribed timelines or failure to maintain continuous registration will require reevaluation of the student's entire program and may result in termination.

### **13.3 Doctoral Program**

#### **Full-time**

All Ph.D. students admitted as full-time students and admitted on the basis of a master's degree must complete the Ph.D. degree requirements within six calendar years after the date of initial Ph.D. registration unless their specific program provides for a different time limit. Terms of non-registration are equated to full-time registration terms when calculating the overall time to program completion.

#### **Part-time**

All Ph.D. students admitted as part-time students must complete the degree requirements within nine calendar years after the date of initial Ph.D. registration. Terms of non-registration are equated to part-time registration terms when calculating the overall time to program completion. A change of a student's status from part-time to full-time status will result in a pro-rated reduction in the required time to completion for each subsequent term of full-time study.

Failure to complete the program within the prescribed timelines or failure to maintain continuous registration will require reevaluation of the student's entire program and may result in termination.

### **13.4 Leave of Absence**

When exemption from registration for a term or terms has been approved by the Vice Provost (Graduate Studies), this period will be exempt from the overall time limit allowed for completion of the program.

Leave of Absence requests are made using the Graduate Studies Academic/Registration Change Form.

### **13.5 Extension of Time Limit**

Students will submit requests for an extension of time limits to the academic department for review. The department must then submit the request to Graduate Studies following Graduate Studies Program Extension Policies and Procedures.

## 14. Co-operative Education Policy

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

### Application Requirements

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

### Participation Requirements

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.
- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

### Co-op Participation Agreement

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

### Communication with the Co-op Office

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

### Graduation with the Co-op Designation

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

### Employment

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic

performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

### Work Term Assessment and Evaluation

#### Work Term Evaluation

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

#### Work Term Assessment

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

#### Voluntary Withdrawal from the Co-op Option

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

#### Involuntary or Required Withdrawal from the Co-op Option

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### International Students

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

### Co-op Fees

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

## 15.0 Grade Review

The Senate of the University establishes academic rules and regulations which are designed to ensure that academic standards are upheld and that all students are treated fairly and equitably. In this regard, a student may submit a petition, which is a formal request for accommodation with regard to normal rules and regulations of the University. Additionally, students may formally appeal the outcome of a petition.

Definition of terms:

- A **petition** is the initial request for
  - a. accommodation with respect to rules or regulations;
  - b. review of a final grade in a course;
  - c. review of process for examination by committee (or other non-coursework milestones);
  - d. review of the decision to deny the award of a degree or the required withdrawal of the student.
- An **appeal** is the formal process by which a student may challenge the decision on a petition.

### 15.1 Rules, regulations, and deadlines

The University understands that extenuating circumstances beyond a student's control can occur and adversely affect a student's ability to meet academic obligations. In those instances, a student may submit a petition, which is a formal request for accommodation with regard to normal rules, regulations and deadlines.

There are two types of circumstances that might warrant a request for an exception to published rules, regulations or deadlines. One type of petition concerns personal circumstances such as illness, unanticipated occupational commitments, or other unanticipated serious events. The second type concerns whether a rule or regulation has been properly or fairly applied to a student's record.

**Petition:** a graduate student seeking accommodation with respect to an academic regulation, rule or deadline submits a petition in writing to Graduate Studies.

**Appeal:** a graduate student may challenge the decision on a petition. Within 10 working days of the decision of the original petition, students may initiate an appeal in writing to the Associate Vice-Provost (Graduate Student Affairs). It is the student's responsibility to ensure that the appeal submission is complete and includes all relevant matters which the Associate Vice Provost should consider in rendering their decision. If the Vice Provost decides not to proceed with the appeal, the student will be informed of the reasons for the decision. If the Vice Provost proceeds with the appeal, the student will be given a concise explanation of the decision and will work with all parties to implement any needed remedy.

### 15.2 Coursework grade appeals

Within 20 working days of the release of final grades, students may request that one or more of their grades be reviewed.

**Appeal:** a graduate student may submit a formal appeal of grade when the petition has not addressed their concerns. The appeal must be submitted to the faculty

dean with required supporting documentation and **using this policy**.

Upon receiving a formal appeal from the student, the faculty dean may decide not to proceed with the appeal if, in the opinion of the dean, reasonable grounds have not been established as a basis for the appeal. Circumstances which may result in a decision not to proceed may include, for example, cases where the dean determines that the petition has adequately addressed the student's concerns or where the dean determines that a reasonable expectation of error or bias in the original grade has not been established. If the dean decides not to proceed with the appeal, the student will be informed of the reasons for the decision.

In proceeding with an appeal, the faculty will proceed with their own internal grade appeal processes. After due consultation, the dean, as chief academic officer of the faculty, will assign the grade. The decision of the dean is final. As a result of this formal appeal process the original grade may be raised, lowered or left unchanged. The student will be given a concise explanation of the decision.

### 15.3 Examination by committee or other non-coursework milestones

Within 20 working days of the announcement of examination by committee (comprehensive examination, qualifying paper, thesis, or research essay) or other non-coursework milestones, students may request review of the process of examination. Such reviews will only be conducted on procedural grounds.

**Petition:** the student must contact their department chair to petition for a procedural review.

**Appeal:** a student may submit a formal appeal when the petition has not addressed their concerns. The appeal must be submitted to Graduate Studies with required supporting documentation and **using this policy**.

Upon receiving a formal appeal from Graduate Studies, the Associate Vice-Provost (Graduate Student Affairs) may decide not to proceed with the appeal if, in their opinion, reasonable grounds have not been established as a basis for the appeal. If the Associate Vice Provost (Graduate Student Affairs) decides not to proceed with the appeal, the student will be informed of the reasons for the decision.

In proceeding with an appeal, the Associate Vice Provost (Graduate Student Affairs) will send a final decision to the student and the faculty dean (and all parties involved) and will work with all parties to implement any needed remedy.

### 15.4 Denial of degree

**Petition:** assuming that a graduate student has exhausted all avenues of appeal and petition with their dean or the Associate Vice Provost (Graduate Student Affairs), a graduate student may petition to the Vice Provost (Graduate Studies) to review the decision of the University to deny the awarding of the degree or the required withdrawal of the student, only on the grounds that they have been denied a degree or forced to withdraw because

of some mistake, error, or improper conduct by the University, its officers, or employees.

**Appeal:** A graduate student may appeal decisions of the Associate Vice Provost (Graduate Student Affairs), with explicit evidence, to the Senate Graduate Student Appeal Committee (GSAC). Such petitions must be based on the following:

- a. The misapplication of an academic regulation contained in the graduate calendar, or
- b. The inappropriateness of the application of a regulation contained in the graduate calendar in the particular circumstances of the student.

## 16.0 Program Review

A graduate student has the right to request a review of decisions made concerning their status or any other ruling relating to their program. All such requests are to be made in writing to the Vice Provost (Graduate Studies).

## 17.0 Records Retention Policy

Since 2005 the University has implemented a records retention policy which provides for the destruction of student file folders and their contents after a period of five years has elapsed since the last registration. This policy applies to those students who are formally admitted and registered in degree programs. Further information on this policy can be obtained by contacting Graduate Studies.

## 18. Use of Student Work in Program Assessment

All academic programs at Carleton University are reviewed cyclically under the mandate of the Ontario Universities Council on Quality Assurance. Several programs at Carleton University are also accredited by professional bodies and must undergo review for continuing accreditation.

Student records and student work such as portfolios, exams, assignments, and theses may be used in the review and evaluation of academic programs. Appropriate steps will be taken to ensure that information and material used in the evaluation of a program is kept confidential and that the processes comply with applicable privacy regulations. These reviews may involve bodies external to the University, for example, in complying with reviews required by the government or professional accreditation bodies.

## 19.0 Academic Integrity

Carleton University's Academic Integrity Policy can be found on this page: <https://carleton.ca/senate/senate-policies/>

## 20. Offenses of Conduct

### 20.1 Discrimination and Harassment

The University has in place policies and procedures to deal with allegations of discrimination and harassment, including sexual harassment. These are outlined in detail in the Carleton University Human Rights Policies and Procedures, effective May 1, 2001, and which can be found at: <https://carleton.ca/equity/>

Unacceptable conduct is outlined in the policy and includes discrimination or harassment based on race, ancestry, place of origin, colour, ethnic origin, citizenship, creed, political affiliation or belief, sex, sexual orientation, gender identity, age, marital status, family status, or disability/handicap within the meaning of the Ontario Human Rights Code. Unacceptable conduct also includes threatening, stalking and unwelcome communication either in person or through electronic or other means. For the three policy sections below, the definition of prohibited behaviour is described in the italicized section that follows.

From the *Anti-Racism and Ethnocultural Relations Policy*

1. The University prohibits discrimination and harassment, including conduct on the basis of race, ancestry, place of origin, colour, ethnic origin and citizenship that:"

From the *Gender Equality Policy*

1. The University prohibits discrimination and harassment, including conduct on the basis of sex, gender or gender identity that:"

From the *Sexual Orientation Equality Policy*

1. The University prohibits discrimination and harassment, including conduct on the basis of sexual orientation or perceived sexual orientation that:
  - 5.1 Is abusive, demeaning or threatening including behaviour such as name calling; derogatory remarks, gestures and physical attacks; or display of derogatory or belittling pictures and graffiti; or
  - 5.2 Biases administrative and appointment decisions, employment and workplace practices, tenure, promotion, appointment, leave and salary determinations; or
  - 5.3 Biases academic decisions such as admissions, grading, the application of Regulations and scheduling of academic activities; or
  - 5.4 Misuses power, authority or influence; or
  - 5.5 Discriminates in the provision of goods and services, or access to premises, accommodation and other facilities."

From the *Sexual Harassment Prevention Policy*

1. Sexual harassment occurs when an individual engages in sexually harassing behaviour or inappropriate conduct of a sexual nature that is known, or ought to reasonably be known to be unwelcome, and that:
  - 6.1 Interferes with the academic or employment performance or participation in a University-related activity for the person harassed; and/or
  - 6.2 Is associated with an expressed or implied promise of employment-related or academic-related consequence for the person harassed (including reward, reprisal or condition of study or employment); and/or
  - 6.3 Provides a basis for academic or employment decisions affecting the person harassed; and/or

6.4 Creates an abusive, demeaning, or threatening study, work or living environment for the person harassed; and/or

6.5 Excludes the person harassed from rights and/or privileges to which they are entitled.

2. Sexually harassing behaviour may be physical, verbal or psychological. It may be conveyed directly or by telephone, writing or electronic means. Examples of inappropriate sexual conduct include:

7.1 Unwelcome sexual solicitations, flirtations or advances; sexually suggestive comments, gestures, threats or verbal abuse;

7.2 Unwarranted touching or physical contact of a sexual nature, coerced consent to sexual contact, or sexual assault;

7.3 Inappropriate display or transmission of sexually suggestive or explicit pictures, posters, objects or graffiti;

7.4 Leering, compromising invitations, or demands for sexual favours;

7.5 Degrading, demeaning or insulting sexual comment or content, including unwelcome remarks, taunting, jokes or innuendo about a person's body, sexuality, sexual orientation or sexual conduct;

7.6 Misuse of position or authority to secure sexual favours;

7.7 Persistent, unwanted attention or requests for sexual contact after a consensual relationship has ended; or

7.8 A course of sexualized comment or conduct that interferes with the dignity or privacy of an individual or group."

From the Sexual Harassment Prevention Policy. Sexual harassment occurs when an individual engages in sexually harassing behaviour or inappropriate conduct of a sexual nature that is known, or ought to reasonably be known to be unwelcome, and that:

1. Interferes with the academic or employment performance or participation in a University-related activity for the person harassed; and/or
2. Is associated with an expressed or implied promise of employment-related or academic-related consequence for the person harassed (including reward, reprisal or condition of study or employment); and/or
3. Provides a basis for academic or employment decisions affecting the person harassed; and/or
4. Creates an abusive, demeaning, or threatening study, work or living environment for the person harassed; and/or
5. Excludes the person harassed from rights and/or privileges to which they are entitled.

Sexually harassing behaviour may be physical, verbal or psychological. It may be conveyed directly or by telephone, writing or electronic means. Examples of inappropriate sexual conduct include:

1. Unwelcome sexual solicitations, flirtations or advances; sexually suggestive comments, gestures, threats or verbal abuse;
2. Unwarranted touching or physical contact of a sexual nature, coerced consent to sexual contact, or sexual assault;
3. Inappropriate display or transmission of sexually suggestive or explicit pictures, posters, objects or graffiti;
4. Leering, compromising invitations, or demands for sexual favours;
5. Degrading, demeaning or insulting sexual comment or content, including unwelcome remarks, taunting, jokes or innuendo about a person's body, sexuality, sexual orientation or sexual conduct;
6. Misuse of position or authority to secure sexual favours;
7. Persistent, unwanted attention or requests for sexual contact after a consensual relationship has ended; or
8. A course of sexualized comment or conduct that interferes with the dignity or privacy of an individual or group.

Enforcement of this policy is carried out according to the procedures established in the policy. The procedures include the provision of advice and information to complainants and respondents and allow for various methods of informal resolution, including mediation.

Students with concerns regarding discrimination, harassment, stalking, sexist or racist behaviour, or any other prohibited action as outlined in the Human Rights Policy, should call or meet with a member of Equity Services for advice and guidance on how to handle the situation. This service is confidential and does not compel the student to take any further action.

Formal complaints must be made in writing and directed to the Dean or Vice President responsible for the area where the complaint took place. Staff in Equity Services are available to assist with the preparation of a formal complaint. Complaints must be made within 12 months after the last alleged incident of discrimination or harassment unless exceptional circumstances apply in which case the University Secretary may grant an extension of up to an additional 12 months.

The procedure for formal complaints is outlined below:

1. An allegation shall be made in writing to the Dean of the Faculty in which the program to which the respondent has been admitted belongs or, in the circumstances where the respondent has not been admitted to a program, to the Dean of the Faculty where the majority of courses in which the respondent has registered are administered. An allegation against a student in residence when made by another student in residence which involves the complainant's enjoyment of her/his accommodation shall be made to the Vice-President (Academic). The Dean, or the Vice-President (Academic), as the case may be, shall cause to have an investigation conducted and, upon receipt of the report of the investigation, shall either

- a. dismiss the allegation on the grounds of insufficient evidence or lack of jurisdiction by the University, or
- b. accept that the allegation is founded and seek the agreement of the respondent to a remedy, or
- c. refer the matter to the President. A Dean's dismissal of the allegation may be appealed, within ten working days, to the Vice-President (Academic) who may, in turn, either
  - i. again dismiss the allegation, or
  - ii. accept that the allegation is founded and propose a remedy to the respondent, or
  - iii. refer the matter to the President. In the case of students in residence, where the original allegation has been made to the Vice-President (Academic) and is dismissed, appeal shall be directly to the President who may either
    1. again dismiss the allegation, or
    2. accept that the allegation is founded and propose a remedy to the respondent, or
    3. refer the matter to a tribunal appointed by the Senate.
2. In the instance where the matter has been referred to the President, the latter shall decide whether or not the University shall conduct a hearing before a tribunal appointed by the Senate.

If the allegation is proven, the tribunal shall decide upon one of the following sanctions:

The student may be:

- a. expelled;
- b. suspended for a period of time from all studies at the University;
- c. restricted in his/her use of University facilities; and/or given a reprimand.

Should the President decide not to conduct a hearing before a tribunal, the allegation shall be deemed to have been dismissed, but the President shall give written reasons for such a decision, and these reasons shall be communicated to the parties involved.

3. In the instance where the complainant wants redress from the University without the involvement of the respondent, or where the respondent is unknown or is not a member of the University community, and/or where there is a claim that the University has failed or has been negligent in providing a safe, non-hostile environment, the allegation of an offence shall be made in writing to the President, who shall cause an investigation to be conducted. Upon receipt of the report of the investigation, the President may order any relief they deem fit, and shall give written reasons for the decision, and which reasons shall be communicated to the complainant.

Information about procedure governing tribunals is available from the Clerk of Senate.

## 21. Graduation

Students must apply online for graduation via Carleton Central. Online applications must be completed by the following deadlines:

- for Spring Graduation (June): April 1
- for Fall Graduation (November): August 31
- for Winter Graduation (February): November 30

## 22. The Course Outline

The instructor is required to provide a formal statement to students called the Course Outline. The course outline must be made available to all students registered in that course, on or before the required date found in the schedule for The Academic Year, normally one week prior to the start of a term.

The course outline must specify:

1. Complete calendar description.
2. Proposed list of topics to be covered.
3. Mandatory Required Materials to be acquired.
4. All the elements that will contribute to the cumulative grade earned and the overall approximate grade breakdown for the course. The elements and grade breakdown may initially be approximate, but are normally confirmed no later than the last day of registration for the term. If faculty deviate from the grading system in section 10 of the Graduate Regulations, the grading system that will be used must be clearly indicated. If additional requirements beyond the cumulative grade earned must be satisfied in order to pass the course, this should be clearly identified in the course outline.
5. Due dates for major course elements should be indicated. The dates may be tentative initially, but are normally confirmed no later than the last day of registration for the term. If changes to due dates are required students should be given at least two weeks notice. Final scheduled exam dates are excluded from the information provided, and will be presented at a later date in the term.
6. TA information, as available.
7. Any required time commitments occurring outside of the formally scheduled lectures, tutorials, labs and discussion groups. Changes may be required but students should be given at least two weeks notice. These time commitments are specific to course requirements and do not imply study time or group work, for example.
8. The outline must also include/reference all University policies governing academic accommodation.

## 23. Early Feedback Guideline

Providing feedback to students on academic work, completed or in progress, is an integral part of teaching and learning in that it allows students to measure their understanding of material, the success of their learning strategies, and their progress on learning objectives. While the nature and frequency of such feedback will vary with the course and level, Carleton University is committed to providing students with appropriate and timely feedback

on their work. Accordingly, wherever possible, instructors are urged to provide some form of feedback prior to the 25th day of each term. More generally, all instructors are urged to include academic work that is assigned, evaluated and returned prior to the 40th teaching day of each term.

The spirit of this guideline should be followed during the summer term and for courses that do not have a full-term format. In particular, all instructors are urged to include academic work that is assigned, evaluated, and returned at least two days prior to the last day to withdraw from the course in the Early, Late, or Full Summer term.

In cases where a course does not lend itself to early feedback, this should be clearly noted on the course outline.

# Glossary

## Glossary

The following glossary of definitions is intended to provide explanations of how certain important terms are used throughout the Calendar. In rare cases where a discrepancy may occur between the definition provided in this Glossary and the use of the term in the remainder of the Calendar, the term as used in the remainder of the Calendar takes precedence.

The Glossary is not intended to be exhaustive; students should refer to Carleton's web site for other important information (e.g., [carleton.ca/registrar](http://carleton.ca/registrar); [gradstudents.carleton.ca](http://gradstudents.carleton.ca)).

Except where noted, all definitions apply to undergraduate and graduate students.

**| A | B | C | D | E | F | G | H | I | J | K | L | M |**  
**| N | O | P | Q | R | S | T | U | V | W | X | Y | Z |**

### Notation Description

#### A

**Academic** The ACE is the end-of-term assessment of student academic standing in undergraduate degree programs and special studies. The possible outcomes of an ACE are *Eligible to Continue*, *Academic Warning*, *Required to Withdraw for Two Terms*, *Continue in Non-Honours*, *Continue in Alternate*, *Dismissed from Program*, or *Required to Withdraw for Two Years*.

**Auditing** A student who attends a course for interest and not for credit. Formal registration is required.

#### B

**Bachelor's** An undergraduate, non-honours academic program of study requiring a minimum of 15.0 credits.

#### C

**Calendar** The official publication of academic regulations, academic programs and course descriptions as approved by the Senate.

**Certificate** An undergraduate certificate is a stand-alone Credential that may be taken concurrently with a bachelor's program or independently. It is normally constituted by a structured set of at least four credits of sequential courses of different levels in a particular discipline or area of study that introduces students to, or extends their knowledge of, that discipline or area of study.

**Challenge for Credit** Undergraduate academic course credit gained through examination based on a student's prior learning experience gained through professional or work experience. A successful challenge for credit is noted in the student's record as CH. (An unsuccessful challenge for credit is noted as UCH). A CH is neither included in the CGPA calculation nor used to satisfy the degree program residency requirement. Challenge for Credit is not available in all courses.

**Collaborative Specialization** At the graduate level the term "collaborative specialization" refers to an Option added to a degree program that provides an experience in a discipline or intellectual area in addition to that provided in the student's home program and meets the requirements identified by the Quality Council's corresponding definition.

**Concentration** A program Element recorded on the transcript and diploma constituted by at least 3.5 credits of required courses at the undergraduate level and 1.5 credits of required courses at the Master's level, that concentrates on a particular area of study within the program and provides the student with specific expertise, knowledge, and/or practice. At the undergraduate level, concentrations are selected after admission and are designed to be completed within the typical length of the program when started in the second year. Programs are not permitted to require students to select a concentration in first year. At the Doctoral level, a concentration is constituted by at least three curricular academic requirements, excluding the dissertation, residency and language requirements, that form a distinctive area of study related to the concentration. Historical exceptions apply at the undergraduate level during a transition period; see individual program requirements.

**Co-operative Education** An undergraduate or graduate Option comprising work periods combined with academic study to acquire work-related experience; the co-op option is intended to complement the student's academic study.

**Core** A course or group of courses that are a subset of the courses that constitute a major in an undergraduate program. These are courses of special importance to undergraduate programs and are subject to specific CGPA requirements.

**Cotutelle** An Option in any Ph.D. program. Doctoral students undertake to complete the requirements of a Ph.D. program in both their home university and a partner university in another country.

**Course** A course is a unit of teaching that may count as credit towards a Credential. Courses typically last one academic term and focus on one subject area with a prescribed sequence of units of study (lectures, seminars, tutorials, workshops, laboratories, assignments, essays, tests, examinations and so on). Courses are delivered by one or more instructors and have a fixed roster of students.

Courses have unique eight-character alphanumeric course codes, titles and descriptions. The credit value is indicated in square brackets following the course number.

**Course Numbering** The first number in a course designation (e.g. 0000, 1000, 2000, 3000, 4000) indicates the knowledge level of a course and not the year of registration or year standing one requires to enroll in it. One can enroll in any course provided one meets the prerequisites. Prerequisites come in many forms and combinations such as but not limited to year standing, completion of other courses, registration in a specific program, permission of the Department, and specific CGPA requirements. 0000-level courses are those that may be required to satisfy prerequisites. 1000-level courses are typically introductory or foundation level courses. 2000-level and 3000-level courses are typically intermediate to upper-intermediate level courses. 4000-level courses are typically advanced level courses. 5000 and 6000-level are graduate level courses.

**Course Outline** Instructors are required to provide students in each course a written Course Outline (distributed in class or electronically), on or before the first teaching day for undergraduate courses, and before the last date for late registration for graduate courses. The course outline must specify all the elements that will contribute to the final grade, as well as the overall grade breakdown for the course.

**Courses Set Aside** Courses that do not contribute to the fulfilment of graduation requirements within the student's program:

1. Extra to the Degree (ETD): Passed credits that are in excess of the required credits;
2. No Credit for Degree (NCD): Passed credits that are ineligible for credit in the student's program;
3. Forfeit: Repeated courses, course equivalencies, preclusions, and courses placed in this category by an academic standing committee or an appeal committee.

**Credential** An academic qualification awarded by the University Senate upon successful completion of an academic program. All credentials are either degrees (bachelors, masters, or doctoral), diplomas, or certificates.

**Credit** The academic value of a course (for example, 0.0, 0.5, 1.0, et cetera).

**Credits Not in the Major** Credits Not in the Major are credits that must be taken in programs that require Credits Not in the Major from disciplines and intellectual areas other than those which constitute the discipline, disciplines or intellectual area of the major in such programs. Credits Not in the Major constitute one form of restricted electives.

**Cumulative Grade Point Average (CGPA)** The key assessment tool for undergraduate Academic Continuation Evaluation, and graduate and undergraduate graduation requirements and distinctions. The CGPA may be used in assessments for scholarships, medals, and other milestones. The CGPA is the average of

grade points earned on all courses required for and counting towards graduation from the student's current program (overall CGPA), or the average of grade points earned on a subset of such courses (for example, those constituting the Major or a Minor) at the time the CGPA is calculated.

## D

**Degree** A Credential at the Bachelor, Master or Doctoral level awarded by the University Senate upon the successful completion of a prescribed set and sequence of program requirements at a specified standard of performance.

**Diploma** **Post-baccalaureate Diploma:** a stand-alone undergraduate credential for candidates already possessing a bachelor's degree intended to: (a) qualify candidates for consideration for entry into a Master's program; (b) bring a candidate who already possesses a bachelor's degree up to a level of a bachelor's degree of 20.0 credits or more in another discipline; (c) provide a candidate who already possesses a twenty-credit bachelor's degree in the same discipline the opportunity to bring their previous studies to current equivalents and/or to examine alternative areas; or, (d) provide a candidate with a professional undergraduate credential for which the prior completion of an undergraduate degree program is appropriate.

Post-baccalaureate diplomas are normally constituted by at least three and a maximum of five credits of advanced undergraduate courses.

## Graduate Diploma:

**Type 1:** Awarded when a candidate admitted to a master's program leaves the program after completing a certain proportion of the requirements. Students are not admitted directly to a Type 1 Diploma.

**Type 2:** Offered concurrently with a master's or doctoral degree, the admission to which requires that the candidate be already admitted to the master's or doctoral degree program. A Type 2 Diploma represents an additional, usually interdisciplinary, qualification of 2 to 3 credits.

**Type 3:** A stand-alone, direct-entry program of 2 to 3 credits, generally developed by a unit already offering a related master's (and sometimes doctoral) degree, and designed to meet the needs of a particular clientele or market.

**Dual Degree** A Dual Degree program is a joint partnership at the undergraduate or Master's level where a co-enrolment agreement exists between Carleton and another post-secondary institution. Students simultaneously complete a program at both institutions, receiving two diplomas. Students must meet the admission criteria and must fulfill all the program requirements of both institutions within the normal time to completion.

## E

**Element** Elements are: (i) Undergraduate: majors, minors, concentrations, and streams; there are a maximum number of elements that may be taken in conjunction with a program at the undergraduate level; (ii) Graduate: concentrations. Elements are recorded on the transcript and the diploma.

**Equivalent Courses** Courses that are of equal credit value and which are considered to be similar enough that they always preclude one another and may serve interchangeably for the other in terms of prerequisites, co-requisites, and program requirements. These will be identified in the calendar as 'Also Listed As', and are commonly referred to as 'cross-listed courses'.

**Experiential Learning** Experiential learning is the application of theory and academic content to real-world experiences within the classroom, the community, or the workplace. It may be undertaken independently or in teams. It advances learning outcomes and encourages reflection and application of skills and knowledge in contexts that prepare students for the workplace and civil society.

## F

**Field** A Field occurs only at the graduate level, and is defined as an identifiable area of research activity undertaken by a group of faculty of sufficient number.

**Flex Term** Flex Term refers to the timing of delivery of 'asynchronous' on-line courses that are currently restricted to special students and in which they may register at any time. Special students may engage with the material of these courses at their own pace. The delivery of 'asynchronous' on-line courses does not therefore conform to the usual beginning and end of Carleton University terms.

**Formative Assessment** Formative assessments are those assessments of a student's work carried out during the course that act to provide feedback and guidance to the student in addition to assessing the student's performance.

**Free Elective** Free electives are any approved credit course normally at the 1000-level or higher – including courses from the discipline, disciplines or intellectual areas that identify the major of the degree program in question – that may be taken to make up the number of credits required for the degree program in question.

## G

**Good Academic Standing** At the undergraduate level, good academic standing signifies that a student is meeting the requirements for continuation in their program as defined in Section 3.2.6 of the *Academic Regulations of the University*.

## H

**Honours Program** An undergraduate Bachelor's program requiring a minimum of 20.0 credits that may demand a higher academic standard than a non-honours program. Pathways to completion may be constituted by a thesis, research essay, capstone project, or other significant project.

## I

**Internship** An internship is constituted through a course or sequence of courses that provides students with work experience directly related to the subject matter of their degree program. There are two types of undergraduate internships:

1. **Program Internship:** an Option constituted by a structured sequence of at least 4.0 credits of courses of different levels in an honours bachelor's program taken in a work environment off-campus. A program internship provides students with extensive professional work experience directly related to the subject matter of their program.

2. **Course Internship:** an individual course within a degree program taken in a work environment either on- or off-campus that provides students with professional work experience directly related to the subject matter of their program.

## L

**Learning Outcomes** Learning outcomes are discipline-specific statements that describe the observable skills or abilities associated with the essential knowledge, behaviours, and/or values all students are expected to acquire by the end of a course or program of study.

**Letter of Permission** A formal document issued by the University Registrar approving a student to register in a course at another institution in lieu of a Carleton course in the student's academic program. The Letter of Permission must be issued before the student takes the course for credit in a Carleton program at another institution.

## M

**Major** A program Element recorded on the transcript and diploma. The major is constituted by the required course credits in one or more defined disciplines or intellectual areas that define the principle focus of a student's undergraduate program, and constitute the basis for the calculation of the Major CGPA. The minimum number of required credits in the major within a 20-credit (or more) program is 8.0 credits. The minimum number of required credits in the major within a 15-credit program is 6.0 credits. Exceptions apply in combined honours programs.

**Major CGPA** The Major CGPA is calculated as the average grade points earned on the courses that constitute the major.

**Mention** An undergraduate Option noted on the transcript denoting specified courses taken in French, which may be used to fulfil program requirements.

**Minor** A program Element at the undergraduate level recorded on the transcript and diploma. A minor is a structured set of credits that form a distinct subset of a program or intellectual area. Each Minor requires at least 4.0 and at most 5.0 credits. Access to minors may be restricted. A minor introduces a student to, or extends their knowledge of, a discipline or intellectual area.

## O

**Option** An optional addition to or component of a program with requirements distinct from those of an Element: (i) Undergraduate: co-operative education, study abroad, Mention : français, program internship; (ii) Graduate: co-operative education, Cotutelle (in Ph.D. programs), Dual Master's Degree (in master's programs), collaborative specialization. Options may be taken in addition to elements and are recorded on the transcript and the diploma.

## P

**Pathway** A pathway through a program is a route to completion such as: stream, thesis, research essay, research project, or course only. Pathways may be chosen in addition to Elements and Options, and are not recorded on the diploma but are recorded on the transcript.

**Practical Assessm** Practical assessments are those assessments, such as exams or term work, of a student's work where the tasks and conditions are similar to what they would experience in a work environment and are designed to complement their academic skills and competencies.

**Prerequisite** A required course or courses that must be completed successfully before registering in the course that requires the prerequisite.

**Preclusion** Courses that contain sufficient content in common that credit may not be earned for more than one of the courses. Courses that preclude one another are not necessarily considered equivalent and may or may not be interchangeable to fulfil program or specific element requirements.

**Program** A specified combination of academic requirements in a discipline or intellectual area of study which leads to a credential (for example, B.A. in Philosophy, Ph.D. in History, M.Sc. in Chemistry, Graduate Diploma in Public Policy and Program Evaluation, Certificate in the Teaching of English as a Second Language).

There are five types of programs at the undergraduate level:

1. **Single-Discipline Program:** A Single-Discipline program is a program of at least 15.0 credits in which the courses that constitute the program's major are drawn overwhelmingly from one discipline or intellectual area.

2. **Thematic Program:** A Thematic program is an interdisciplinary program of at least 15.0 credits that concentrates on a particular interdisciplinary intellectual area or theme, and draws on courses within its major from at least three disciplines or intellectual areas.

3. **Single-Discipline Honours Program:** A Single-Discipline Honours program is a program of at least 20.0 credits in which the courses that constitute the program's major are drawn overwhelmingly from one discipline or intellectual area. Pathways to completion constituted by a thesis, research essay or significant project may demand a higher academic standard than a course-based pathway.

4. **Combined Honours Program:** A Combined Honours program is a program of at least 20.0 credits in which a student fulfils the requirements for combined honours majors in two such majors from two different programs. Pathways to completion constituted by a thesis, research essay or significant project may demand a higher academic standard than a course-based pathway.

5. **Thematic Honours Program:** A Thematic Honours program is an interdisciplinary program of at least 20.0 credits that concentrates on a particular interdisciplinary intellectual area or theme, and draws on courses within its major from at least three disciplines or intellectual areas. Pathways to completion constituted by a thesis, research essay or significant project may demand a higher academic standard than a course-based pathway.

## R

**Restricted Elective** Restricted electives are courses required to fulfil elective requirements in an undergraduate program that are not free electives. The courses that may fulfil restricted elective requirements in

any program are in other words prescribed by the program.

Students should refer to individual program descriptions to determine the courses that may fulfil restricted elective requirements for a program.

## S

**Specialization** At the graduate level, see definition for 'collaborative specialization'. Historical exceptions apply at the undergraduate level during a transition period; see individual program requirements.

**Special Students** Students not admitted to a program or a degree leading to a Credential.

**Status** Full-time status for tuition fee purposes:

1. Undergraduate students are full-time when registered in a 60% course load per term as defined by the student's academic program: for example, registered in at least 1.5 credits per term in a 2.5 credit normal term course load. Undergraduate students should consult the website of the Academic Advising Centre to determine their eligibility for various Provincial and University services according to the number of credits taken each term.
2. Graduate students are normally admitted and must stay continuously registered as full-time. Students may apply to Graduate Studies for exemption from full-time status in exceptional circumstances (for example, medical circumstances); exemptions are normally granted for one term.

Part-time status for tuition fee purposes:

1. Undergraduate students are part-time when registered in less than a 60% course load per term as defined by the student's academic program (for example, registered in less than 1.5 credits per term).
2. Graduate students may be admitted as part-time students and will be required to continue and complete their program as part-time; a part-time student is not eligible to register in more than 1.25 credits per term, including audit courses.

**Stream** A program Element recorded on the transcript and diploma constituted by at least 1.5 credits of courses that facilitate focus on a particular area of study within the program. Streams are selected after admission and are designed to be completed within the typical length of the program when started in the second year of study. Programs are not permitted to require students to select a stream in the first year. Historical exceptions apply at the undergraduate level during a transition period; see individual program requirements.

**Summative Assessments** Summative assessments are those assessments of a student's work carried out at the end of a course or the end of specific components of a course whose sole purpose is to constitute a judgement on a student's performance in the course or a specific component of the course.

## T

**Term GPA** Within the Academic Continuation Evaluation for undergraduate and special students, the Term GPA is the ratio of the grade points earned on a course or courses to the total credit value completed in the term of assessment.

**Topics Courses** **Selected Topics** courses normally address topics which fall within a narrow range of topics within a common theme indicated by the course title. Students may not repeat selected topics courses for credit.

**Special Topics** normally address topics chosen from a broad range of topics within a discipline. Their topics vary widely from year-to-year. Students may repeat special topics courses for credit when the topics vary.

**Transfer Credit** Academic credit granted for individual courses successfully completed at another institution, either upon admission (admitted with advanced standing from secondary school, or transfer from college or university) or while registered with a Letter of Permission or on exchange.

**Transcript** The official record of a student's academic registration and accomplishments at Carleton University.

## U

**Undeclared Students** Undergraduate students admitted to a degree who have not chosen a program ('declared a major') within that degree; normally, students are required to choose a program ('declare a major') upon or before completing 3.5 credits.

## W

**Withdrawal** A formal process for discontinuing studies in a course or a program.

Undergraduate students who wish to drop all courses and terminate their registration in the academic program must follow the procedure available through the Registrar's Office. Students who have been away from the University for nine or more consecutive terms will be withdrawn and must re-apply for admission.

Graduate students who wish to drop all courses and terminate their registration in the academic program must notify their department in writing of their intention to withdraw. Students who do not register for three consecutive terms or do not register continuously in their thesis, research essay, or independent research project will be withdrawn and must re-apply for admission.

## Graduate Programs

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Accessibility (Collaborative Specialization)  
Accounting  
African Studies (Collaborative Specialization)  
Anthropology  
Applied Linguistics and Discourse Studies  
Architecture  
Art and Architectural History  
  
Biochemistry (Collaborative Specialization)  
Bioinformatics (Collaborative Specialization)  
Biology  
Biomedical Engineering  
Biotechnology  
Building Engineering  
Business  
  
Canadian Studies  
Chemical and Environmental Toxicology (Collaborative Specialization)  
Chemistry  
Civil Engineering  
Climate Change (Collaborative Specialization)  
Clinical Trials  
Cognitive Science  
Communication  
Computer Science  
Cultural Mediations  
Curatorial Studies (Graduate Diploma)  
Cybersecurity (Collaborative Specialization)  
  
Data Science (Collaborative Specialization)  
Data Science, Analytics, and Artificial Intelligence Design  
Digital Humanities (Collaborative Specialization)  
Digital Media  
  
Earth Sciences  
Economics  
Electrical and Computer Engineering  
Engineering Practice  
English  
Environmental Engineering  
Ethics and Public Affairs  
European, Russian and Eurasian Studies  
  
Film Studies  
Finance  
  
Geography  
  
Health Sciences  
History  
Human-Computer Interaction  
Human Rights and Social Justice  
  
Indigenous Policy and Administration  
Information Technology  
Infrastructure Protection and International Security  
International Affairs  
  
Journalism  
  
Latin American and Caribbean Studies (Collaborative Specialization)  
Legal Studies

Linguistics

Management  
Mathematics and Statistics  
Mechanical and Aerospace Engineering  
Migration and Diaspora Studies  
Music and Culture  
  
Neuroscience  
Networking Technology  
Northern Studies  
  
Philanthropy and Nonprofit Leadership  
Philosophy  
Physics  
Political Economy  
Political Economy (Collaborative Specialization)  
Political Management  
Political Science  
Psychology  
Public Policy and Administration  
  
Social Statistics and Data Analysis (Graduate Diploma)  
Social Work  
Sociology  
Sustainable Energy  
  
Teaching English as an Additional Language  
Technology Innovation Management  
  
Women's and Gender Studies  
Work and Labour

## Accessibility (Collaborative Specialization)

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This section presents the requirements for programs in:

- **M.A. Anthropology with Collaborative Specialization in Accessibility**
- **M. Architecture 3-year stream with Collaborative Specialization in Accessibility**
- **M. Architecture 2-year stream with Collaborative Specialization in Accessibility**
- **M.A.Sc. Biomedical Engineering with Collaborative Specialization in Accessibility**
- **M.Eng. Biomedical Engineering with Collaborative Specialization in Accessibility**
- **Master of Design with Collaborative Specialization in Accessibility**
- **Master of Entrepreneurship - Technology Innovation Management with Collaborative Specialization in Accessibility**
- **M.A. Geography with Collaborative Specialization in Accessibility**
- **M.Sc. Health Sciences with Collaborative Specialization in Accessibility**
- **M.Sc. Health: Science, Technology and Policy with Collaborative Specialization in Accessibility**
- **M.A. History with Collaborative Specialization in Accessibility**
- **Master of Human-Computer Interaction with Collaborative Specialization in Accessibility**

- **M.A. Legal Studies with Collaborative Specialization in Accessibility**
- **M.A. Music and Culture with Collaborative Specialization in Accessibility**
- **M.Sc. Neuroscience with Collaborative Specialization in Accessibility**
- **M.A. Political Economy with Collaborative Specialization in Accessibility**
- **M.A. Sociology with Collaborative Specialization in Accessibility**
- **M.A. Women's and Gender Studies with Collaborative Specialization in Accessibility**

## Program Requirements

### M.A. Anthropology with Collaborative Specialization in Accessibility (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5401 [0.5]	Theory in Anthropology
ANTH 5402 [0.5]	Research in Anthropology
<b>3. 1.0 credit in ANTH at the graduate level (not including those listed above). With departmental permission 0.5 credit may be selected from courses at the 4000-level.</b>	<b>1.0</b>
<b>4. 2.0 credits in:</b>	<b>2.0</b>
ANTH 5909 [2.0]	M.A. Thesis (in the specialization)
5. An oral examination on the candidate's thesis and program	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits):

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5401 [0.5]	Theory in Anthropology
ANTH 5402 [0.5]	Research in Anthropology
<b>3. 2.0 credits in approved electives, chosen in consultation with the student's advisor</b>	<b>2.0</b>
<b>4. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5908 [1.0]	M.A. Research Essay (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway (5.0 credits):

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5401 [0.5]	Theory in Anthropology
ANTH 5402 [0.5]	Research in Anthropology

<b>3. 0.5 credit in a course designated as having sufficient accessibility content and approved by the Anthropology graduate coordinator</b>	<b>0.5</b>
<b>3. 2.5 credits in approved electives, chosen in consultation with the student's advisor</b>	<b>2.5</b>
<b>Total Credits</b>	<b>5.0</b>

### M. Architecture 3-year stream with Collaborative Specialization in Accessibility (15.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 6.0 credits in core:</b>	<b>6.0</b>
ARCH 5221 [0.5]	Ecological & Regulatory Systems
ARCH 5222 [0.5]	Structures
ARCH 5223 [1.0]	Assemblies and Environmental Systems
ARCH 5224 [0.5]	Advanced Building Systems
ARCH 5331 [0.5]	Modernism and Global Urbanism
ARCH 5332 [0.5]	Contemporary Theories in Architecture
ARCH 5333 [0.5]	Selected Topics in Architectural Theory
ARCH 5441 [0.5]	Studio 1: Workshop
ARCH 5444 [0.5]	Comprehensive Studio Workshop
ARCH 5551 [0.5]	Professional Practice
ARCH 5552 [0.5]	Design Thesis Preparation
<b>3. 5.0 credits in studio:</b>	<b>5.0</b>
ARCH 5111 [1.0]	Studio I: Land & Environment
ARCH 5112 [1.0]	Studio II: Materiality + Adaptation
ARCH 5113 [1.0]	Studio III: Urbanism + Society
ARCH 5114 [1.0]	Comprehensive Studio: Climate + Integration
ARCH 5115 [1.0]	Graduate Studio Abroad: Agency + Justice
<b>4. 2.0 credits in:</b>	<b>2.0</b>
ARCH 5555 [2.0]	Architecture Thesis (in the Specialization)
<b>5. 1.0 credits in free electives at the 4000-level or higher</b>	<b>1.0</b>
<b>Total Credits</b>	<b>15.0</b>

### M. Architecture 2-year stream with Collaborative Specialization in Accessibility (8.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

<b>1. 1.0 credits in:</b>	<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 2.5 credits in core:</b>	<b>2.5</b>
ARCH 5224 [0.5]	Advanced Building Systems
ARCH 5333 [0.5]	Selected Topics in Architectural Theory

ARCH 5444 [0.5]	Comprehensive Studio Workshop	
ARCH 5551 [0.5]	Professional Practice	
ARCH 5552 [0.5]	Design Thesis Preparation	
<b>3. 2.0 credits in studio:</b>		<b>2.0</b>
ARCH 5114 [1.0]	Comprehensive Studio: Climate + Integration	
ARCH 5115 [1.0]	Graduate Studio Abroad: Agency + Justice	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
ARCH 5555 [2.0]	Architecture Thesis (in the Specialization)	
<b>5. 0.5 credits in free electives at the 4000-level or higher</b>		<b>0.5</b>
<b>Total credits</b>		<b>8.0</b>

### **M.A.Sc. Biomedical Engineering with Collaborative Specialization in Accessibility (5.0 credits)**

#### **Requirements - Thesis pathway:**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
BIOM 5010 [0.5]	Introduction to Biomedical Engineering	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>3. 1.0 credit in BIOM(BMG) courses</b>		<b>1.0</b>
<b>4. 2.5 credits in:</b>		<b>2.5</b>
BIOM 5909 [2.5]	M.A.Sc. Thesis (in the specialization)	
<b>5. 0.0 credit in:</b>		
BIOM 5800 [0.0]	Biomedical Engineering Seminar	
<b>Total Credits</b>		<b>5.0</b>

### **M.Eng. Biomedical Engineering with Collaborative Specialization in Accessibility (5.0 credits)**

#### **Requirements - coursework pathway**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
BIOM 5010 [0.5]	Introduction to Biomedical Engineering	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>3. 2.0 credits in BIOM (BMG) courses</b>		<b>2.0</b>
<b>4. 0.5 credit in the area of the specialization at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director</b>		<b>0.5</b>
<b>4. 1.0 credit in elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director</b>		<b>1.0</b>
<b>5. 0.0 credit in:</b>		
BIOM 5800 [0.0]	Biomedical Engineering Seminar	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - by project:**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
BIOM 5010 [0.5]	Introduction to Biomedical Engineering	

<b>2. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>3. 1.5 credits in BIOM (BMG) courses</b>		<b>1.5</b>
<b>4. 0.5 credit in elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director</b>		<b>0.5</b>
<b>5. 0.0 credit in:</b>		
BIOM 5800 [0.0]	Biomedical Engineering Seminar	
<b>6. 1.5 credit in:</b>		<b>1.5</b>
BIOM 5900 [1.5]	Biomedical Engineering Project (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### **Master of Design with Collaborative Specialization in Accessibility (5.0 credits)**

#### **Requirements:**

<b>1. 1.5 credits in:</b>		<b>1.5</b>
IDES 5101 [0.5]	Interdisciplinary Design Development Seminar	
IDES 5102 [0.5]	Design Research Methods	
IDES 5103 [0.5]	Interdisciplinary Design Development Studio	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>3. 0.5 credit in elective course</b>		<b>0.5</b>
<b>4. 2.0 credits in:</b>		<b>2.0</b>
IDES 5909 [2.0]	Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### **Master of Entrepreneurship - Technology Innovation Management with Collaborative Specialization in Accessibility (5.5 credits)**

Students in the Master of Entrepreneurship program are required to complete a total of 5.5 credits of which at least 5.0 must be at the 5000-level or above, as follows:

#### **Requirements - Project pathway (5.5 credits)**

<b>1. 2.5 credits in:</b>		<b>2.5</b>
TIMG 5001 [0.5]	Principles of Technology Innovation Management	
TIMG 5002 [0.5]	Technology Entrepreneurship	
TIMG 5008 [0.5]	Foundations of Digital Transformation & Entrepreneurship	
TIMG 5205 [0.5]	Customer Value Creation in Technology Firms	
TIMG 5201 [0.5]	Technology and Wealth	
<b>2. 1.0 credit in approved restricted electives in TIMG</b>		<b>1.0</b>
<b>3. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>4. 1.0 credit in:</b>		<b>1.0</b>

TIMG 5905 [1.0]	M.Ent. Project (in the specialization)	
<b>Total Credits</b>		<b>5.5</b>

**M.A. Geography with Collaborative Specialization in Accessibility (5.5 credits)**

**Requirements:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
GEOG 5000 [0.5]	Approaches to Geographical Inquiry	
GEOG 5905 [0.5]	Masters Research Workshop	
<b>3. 2.5 credits in:</b>		<b>2.5</b>
GEOG 5909 [2.5]	M.A. Thesis (in the specialization and including oral examination of the thesis)	
<b>4. 1.0 credit in approved graduate-level electives</b>		<b>1.0</b>

5. In addition to the formal requirements, MA students are required to attend the Departmental Seminar series, and the Graduate Field Camp

<b>Total Credits</b>		<b>5.5</b>
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**M.Sc. Health Sciences with Collaborative Specialization in Accessibility (6.0 credits)**

**Requirements:**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences	
<b>2. 0.5 credit from:</b>		<b>0.5</b>
HLTH 5902 [0.5]	Seminars in Interdisciplinary Health Sciences for MSc	
or elective, approved by Thesis Supervisor and Graduate Advisor		
<b>3. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
HLTH 5906 [0.0]	Research Seminar Presentation for MSc	
HLTH 5905 [0.0]	Final Research Seminar Presentation for MSc	
<b>5. 4.0 credits in:</b>		<b>4.0</b>
HLTH 5909 [4.0]	MSc Thesis (in the specialization)	

**6. Twice-yearly meetings with the thesis Graduate Advisory Committee, with students meeting a level of progress as determined by the Committee.**

<b>Total Credits</b>		<b>6.0</b>
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**M.Sc. Health: Science, Technology and Policy with Collaborative Specialization in Accessibility (6.0 credits)**

**Requirements:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	

ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>2. 3.0 credits in:</b>		<b>3.0</b>
HLTH 5100 [0.5]	Fundamentals of Research Methods	
HLTH 5150 [0.5]	Statistics for Health Sciences	
HLTH 5201 [0.5]	Fundamentals of Policy I: Policy Analysis	
HLTH 5300 [0.5]	Knowledge Translation	
HLTH 5350 [0.5]	New Health Technologies	
HLTH 5402 [0.5]	Biological and Social Fundamentals of Health	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences	
<b>4. 1.0 credit from:</b>		<b>1.0</b>
HLTH 5507 [1.0]	Interdisciplinary Health Research Project (in the specialization)	
<b>5. 0.5 credit from:</b>		<b>0.5</b>
a. HLTH selected topic elective courses focusing on areas of specific relevance to the health sector		
HLTH 5151 [0.5]	Principles of Epidemiology	
HLTH 5202 [0.5]	Fundamentals of Policy II: The Health Sector	
HLTH 5403 [0.5]	Host-Pathogen Interactions	
HLTH 5600 [0.25]	Special Topics in Biostatistics and Epidemiology	
HLTH 5601 [0.25]	Special Topics in Health Policy and Administration	
HLTH 5602 [0.25]	Special Topics: Social and Behavioural	
HLTH 5603 [0.25]	Special Topics in Environmental Health	
HLTH 5604 [0.25]	Special Topics in the Science of Disease	
HLTH 5605 [0.25]	Special Topics: Engineering, Design and Computer Science	
HLTH 5701 [0.5]	Special Topics in Health Policy and Administration	
HLTH 5702 [0.5]	Special Topics: Social and Behavioural	
HLTH 5703 [0.5]	Special Topics in Environmental Health	
HLTH 5704 [0.5]	Special Topics in the Science of Disease	
HLTH 5705 [0.5]	Special Topics: Engineering, Design and Computer Science	
HLTH 5800 [0.5]	Directed Studies in Health: Science, Technology and Policy	
HLTH 5801 [0.5]	Health: Science, Technology and Policy Practicum	
b. Courses offered by other graduate programs, selected with the guidance and permission of the supervisor of graduate studies and with the permission of the specific program and requiring the prior completion of prerequisites. Examples include:		
BIOL 5407 [0.5]	Biostatistics I	
BIOL 5515 [0.5]	Bioinformatics	
BIOL 5516 [0.5]	Applied Bioinformatics	
BIOL 6406 [0.5]	Genetic Toxicology	
BIOM 5100 [0.5]	Biomedical Instrumentation	

CHEM 5708 [0.5]	Principles of Toxicology	
CHEM 5709 [0.5]	Chemical Toxicology	
COMS 5206 [0.5]	Communication, Culture, Regulation	
COMP 5308 [0.5]	Topics in Medical Computing	
INAF 5705 [0.5]	Global Social Policy	
INAF 5706 [0.5]	Global Health Policy	
NEUR 5201 [0.5]	Foundations in Statistics for Neuroscience	
PADM 5221 [0.5]	Health Policy in Canada	
PADM 5222 [0.5]	Economics and Health Policy	
PADM 5229 [0.5]	The Health of Populations	
PADM 5817 [0.5]	Health Policy in Developing Countries	
PHIL 5000 [0.5]	Special Topic in Philosophy	
PHYS 5204 [0.5]	Physics of Medical Imaging	
PSYC 5209 [0.5]	Topics in Health Psychology	
SOCI 5209 [0.5]	Sociology of Science and Technology	
SOWK 5302 [0.5]	Mental Health	
STAT 5600 [0.5]	Mathematical Statistics I	
STAT 5501 [0.5]	Mathematical Statistics II	
STAT 5602 [0.5]	Analysis of Categorical Data	
<b>Total Credits</b>		<b>6.0</b>

### M.A. History with Collaborative Specialization in Accessibility (4.5 credits)

#### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
HIST 5003 [0.5]	Historical Theory and Method	
<b>3. 1.0 credit in HIST at the graduate level at Carleton;</b> up to 0.5 credit may be taken in designated public history courses. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.		<b>1.0</b>
<b>4. 2.0 credits in:</b>		<b>2.0</b>
HIST 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

#### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>	1.0
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>3. 1.5 credits in HIST</b> at the graduate level at Carleton; up to 0.5 credit may be taken in designated public history courses. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.5
<b>4. 0.5 credit in:</b>	0.5
HIST 5900 [0.5]	Directed Research

<b>5. 1.0 credit in:</b>		1.0
HIST 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

### Master of Human-Computer Interaction with Collaborative Specialization in Accessibility (5.5 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		0.5
HCIN 5100 [0.5]	Fundamentals of HCI Design and Evaluation	
<b>2. 0.5 credit in:</b>		0.5
HCIN 5200 [0.5]	Software and User Interface Development	
<b>3. 0.5 credit in:</b>		0.5
HCIN 5300 [0.5]	Emerging Interaction Techniques	
<b>4. 0.5 credit from</b> the following, to be selected with the approval of the supervisor		0.5
HCIN 5400 [0.5]	Experimental Methods and Statistics	
HCIN 5403 [0.5]	Research methods in HCI	
HCIN 5404 [0.5]	Design Research Methods	
HCIN 5407 [0.5]	Empirical Research Methods in HCI	
<b>5. 1.0 credit in:</b>		1.0
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>6. 2.5 credits in:</b>		2.5
HCIN 5909 [2.5]	Thesis in Human-Computer Interaction (in the specialization)	
<b>Total Credits</b>		<b>5.5</b>

### M.A. Legal Studies with Collaborative Specialization in Accessibility (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

1. 1.0 credit in:		1.0
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
2. 1.0 credit in:		1.0
LAWS 5000 [0.5]	Theories of Law and Social Transformation	
LAWS 5001 [0.5]	Legal Method and Social Inquiry	
3. 1.0 credit in LAWS		1.0
4. 2.0 credits in:		2.0
LAWS 5909 [2.0]	M.A. Thesis (in the specialization. Includes an oral examination)	
Total Credits		5.0

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 1.0 credit in:</b>	1.0
LAWS 5000 [0.5]	Theories of Law and Social Transformation

LAWS 5001 [0.5]	Legal Method and Social Inquiry	
<b>3. 2.0 credits in LAWS</b>		<b>2.0</b>
<b>4. 1.0 credit in:</b>		<b>1.0</b>
LAWS 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
LAWS 5000 [0.5]	Theories of Law and Social Transformation	
LAWS 5001 [0.5]	Legal Method and Social Inquiry	
<b>3. 2.5 credits in LAWS</b>		<b>2.5</b>
<b>4. 0.5 credit in</b>	a course designated as having sufficient accessibility content and approved by the Legal Studies Graduate Supervisor	<b>0.5</b>
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Music and Culture with Collaborative Specialization in Accessibility (5.0 credits)**

#### **Requirements - Thesis pathway:**

<b>1. 1.0 credits in:</b>		<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 1.0 credit in</b>	additional MUSI coursework chosen from available electives	<b>1.0</b>
<b>3. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
MUSI 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research essay pathway:**

<b>1. 1.0 credits in:</b>		<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.0 credits in</b>	additional MUSI coursework chosen from available electives	<b>2.0</b>
<b>3. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
MUSI 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Coursework pathway:**

<b>1. 1.0 credits in:</b>		<b>1.0</b>
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MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 3.0 credits in</b>	additional MUSI coursework chosen from available electives, including 0.5 credit designated as having sufficient accessibility content	<b>3.0</b>
<b>3. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>Total Credits</b>		<b>5.0</b>

### **M.Sc. Neuroscience with Collaborative Specialization in Accessibility (5.5 credits)**

#### **Requirements:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
NEUR 5100 [1.0]	Fundamentals in Neuroscience	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
NEUR 5201 [0.5]	Foundations in Statistics for Neuroscience	
<b>4. 3.0 credits in:</b>		<b>3.0</b>
NEUR 5909 [3.0]	M.Sc. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.5</b>

### **M.A. Political Economy with Collaborative Specialization in Accessibility (5.0 credits)**

#### **Requirements - Thesis pathway:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>3. 2.0 credits in:</b>		<b>2.0</b>
PECO 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>4. 1.0 credit in</b>	approved graduate-level electives (see Selection of Courses, below). Up to 1.0 credit may be taken at the 4000-level.	<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research essay pathway:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5908 [1.0]	Research Essay (in the specialization)	

**4. 2.0 credits in** approved graduate-level electives (see Selection of Courses, below). Up to 1.0 credit may be taken at the 4000-level. 2.0

**Total Credits** 5.0

### M.A. Sociology with Collaborative Specialization in Accessibility (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

**1. 1.0 credit in:** 1.0

SOCI 5005 [0.5] Recurring Debates in Social Thought

SOCI 5809 [0.5] The Logic of the Research Process

**2. 1.0 credit in:** 1.0

ACCS 5001 [0.5] Critical Disability Studies

ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar

**3. 1.0 credit in** SOCI at the graduate level (not including those listed above). With departmental permission 0.5 credit may be selected from courses at the 4000-level. 1.0

**4. 2.0 credits in:** 2.0

SOCI 5909 [2.0] M.A. Thesis (in the specialization)

5. An oral examination on the candidate's thesis and program

**Total Credits** 5.0

#### Requirements - Research essay pathway (5.0 credits):

**1. 1.0 credit in:** 1.0

SOCI 5005 [0.5] Recurring Debates in Social Thought

SOCI 5809 [0.5] The Logic of the Research Process

**2. 1.0 credit in:** 1.0

ACCS 5001 [0.5] Critical Disability Studies

ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar

**3. 2.0 credits in** SOCI at the graduate level (not including those listed above). With departmental permission 0.5 credit may be selected from courses at the 4000-level. 2.0

**4. 1.0 credit in:** 1.0

SOCI 5908 [1.0] M.A. Research Essay (in the specialization)

5. An oral examination on the candidate's thesis and program

**Total Credits** 5.0

#### Requirements - Coursework pathway (5.0 credits):

**1. 1.0 credit in:** 1.0

SOCI 5005 [0.5] Recurring Debates in Social Thought

SOCI 5809 [0.5] The Logic of the Research Process

**2. 1.0 credit in:** 1.0

ACCS 5001 [0.5] Critical Disability Studies

ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar

**3. 0.5 credit in** a course designated as having sufficient accessibility content and approved by the Sociology graduate coordinator 0.5

**4. 2.5 credits in** SOCI at the graduate level (not including those listed above). With departmental permission 0.5 credit may be selected from courses at the 4000-level. 2.5

**Total Credits** 5.0

### M.A. Women's and Gender Studies with Collaborative Specialization in Accessibility (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

**1. 1.0 credit in:** 1.0

ACCS 5001 [0.5] Critical Disability Studies

ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar

**2. 0.5 credit in:** 0.5

WGST 5900 [0.5] Program Seminar

**3. 0.5 credit in:** 0.5

WGST 5906 [0.5] Feminist Theory

**4. 0.5 credit in:** 0.5

WGST 5907 [0.5] Researching Women's and Gender Issues

**5. 0.5 credit in** additional course work chosen from available elective courses. 0.5

**6. 2.0 credits in:** 2.0

WGST 5909 [2.0] M.A. Thesis (in the specialization)

**Total Credits** 5.0

#### Requirements - Research essay pathway (5.0 credits):

**1. 1.0 credit in:** 1.0

ACCS 5001 [0.5] Critical Disability Studies

ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar

**2. 0.5 credit in:** 0.5

WGST 5900 [0.5] Program Seminar

**3. 0.5 credit in:** 0.5

WGST 5906 [0.5] Feminist Theory

**4. 0.5 credit in:** 0.5

WGST 5907 [0.5] Researching Women's and Gender Issues

**5. 1.5 credits in** additional course work chosen from available elective courses (see below) 1.5

**6. 1.0 credit in:** 1.0

WGST 5908 [1.0] Research Essay (in the specialization)

**Total Credits** 5.0

#### Requirements - Coursework Pathway (5.0 credits):

**1. 1.5 credits in:** 1.5

WGST 5900 [0.5] Program Seminar

WGST 5906 [0.5] Feminist Theory

WGST 5907 [0.5] Researching Women's and Gender Issues

**2. 1.0 credit in:** 1.0

ACCS 5001 [0.5] Critical Disability Studies

ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar

**3. 0.5 credit in** a course designated as having sufficient accessibility content and approved by the Women's and Gender Studies graduate advisor. 0.5

**4. 2.0 credits in Women's and Gender Studies courses** 2.0  
or approved electives. With Institute permission 0.5 credit  
may be selected from courses at the 4000-level.

**Total Credits** 5.0

## Regulations

See the General Regulations section of this Calendar, and the regulations of the participating unit.

## Admission

Admission to the collaborative master's program in Accessibility is available to master's students who are admitted in one of the participating master's programs. To apply to one of the participating master's programs, please visit the Graduate Studies Admissions page.

## Accessibility (ACCS) Courses

### ACCS 5001 [0.5 credit]

#### Critical Disability Studies

Course engages disability theory, culture, and activism to consider bodily difference and its relation to the workings of power and social control, accessibility, normalization, ableism, and medicalization. Students will gain an understanding of the contemporary debates, theories, and methodologies of critical disability studies.

Also listed as SOCI 5401.

### ACCS 5002 [0.5 credit]

#### Accessibility and Inclusive Design Seminar

Provides foundational knowledge, exploring interdisciplinary approaches for incorporating accessible, inclusive, and human-centred design principles into the research, design, and development of products, information, and environments that can be used by all people, regardless of ability.

Includes: Experiential Learning Activity

Also listed as IDES 5104.

# Accounting

This section presents the requirements for programs in:

- **Master of Accounting**

## Program Requirements

### Master of Accounting (6.0 credits)

#### Requirements:

<b>1. 5.0 credits in compulsory courses:</b>	<b>5.0</b>
ACCT 5120 [0.5]	Advanced Concepts
ACCT 5121 [0.5]	Advanced Concepts II
ACCT 5123 [0.5]	Advanced Taxation
ACCT 5124 [0.25]	Data Analytics for Professional Accountants
ACCT 5125 [0.5]	Advanced Assurance
ACCT 5128 [0.25]	Strategy for Professional Accountants
ACCT 5129 [0.25]	Professional Accounting Cases I
ACCT 5130 [0.5]	Advanced Finance
ACCT 5131 [0.5]	Performance Management
ACCT 5134 [0.5]	Advanced Integration I
ACCT 5136 [0.5]	Advanced Integration II
ACCT 5137 [0.25]	Professional Accounting Cases II
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ACCT 5199 [1.0]	Internship
<b>Total Credits</b>	<b>6.0</b>

## Regulations - M.Acct.

See the General Regulations section of this Calendar.

### Guidelines for Completion

Students admitted as full-time students must normally complete their degree requirements within four terms after the date of initial registration.

### Academic Standing

A grade of B- or better is normally required in each credit counted towards the degree. However, a candidate may, with the recommendation of the School and the approval of the Vice Provost (Graduate Studies), be allowed to count a grade of C+ in 0.75 credits.

Withdrawal from the program will be required if an M.Acc. student:

- Receives a grade of lower than B- in 1.25 credits or more, or
- Fails to achieve a weighted GPA of 7.0 after completing 2.0 credits of study, or to maintain it, or
- Receives a grade lower than C+ in the same course more than once.

### Regularly Scheduled Break

For immigration purposes the winter term (January to April) for the full-time MAcct. Program is considered a regularly scheduled break approved by the University. Students should resume full-time studies in May.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or

Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## **M. Accounting**

Applicants are expected to hold an honours bachelor's degree or equivalent, with a minimum overall average of B-; demonstrated coverage of the CPA Competency Map at the 'Entry' level, and a minimum grade of C- in each of the prerequisite courses (courses that meet the Entry level requirements of the CPA Competency Map) with a minimum overall average of B+ in the prerequisite courses.

Students who hold a CPA, CMA designation and who have completed the Strategic Leadership Program, Case Examination and Board Report, may be exempted from the course ACCT 5134 Advanced Integration I, with the approval of the M.Acc. Director.

Proficiency in English is necessary to pursue graduate studies at Carleton University. See Section 3.6 of the General Regulations of this Calendar for English proficiency rules.

## **Accounting (ACCT) Courses**

### **ACCT 5001 [0.25 credit]**

#### **Financial Accounting**

Fundamentals of financial accounting. Techniques used to measure business transactions, preparation of financial statements, recording and valuation of assets, liabilities and equities.

Precludes additional credit for BUSI 5004 (no longer offered).

### **ACCT 5002 [0.25 credit]**

#### **Managerial Accounting**

Fundamentals of managerial accounting and control. Techniques for management decision-making, planning, and control including cost-volume-profit analysis, product costing, variance analysis, relevant costing, transfer pricing and the balanced scorecard.

Precludes additional credit for BUSI 5005 (no longer offered).

Prerequisite(s): ACCT 5001.

### **ACCT 5011 [0.25 credit]**

#### **Financial Statement Analysis**

A user-oriented approach to the study of financial statements. The role of the financial statements and the annual report in the financial reporting process, using ratio analysis to analyze firm performance and make forecasts of future performance.

Precludes additional credit for BUSI 5000 (no longer offered).

Prerequisite(s): ACCT 5001.

### **ACCT 5012 [0.25 credit]**

#### **Performance Measurement and Control**

Efficacy and efficiency of corporate strategies. Design and use of performance measurement systems from an organizational integrated systems view. Balanced scorecard, activity-based management, and other performance measurement and control systems.

Includes: Experiential Learning Activity

Precludes additional credit for BUSI 5000 (no longer offered).

Prerequisite(s): ACCT 5002.

### **ACCT 5013 [0.25 credit]**

#### **Financial Reporting and Control in Public Organizations**

Public sector accounting principles, practices, and unique financial reporting requirements. Comparison with private sector financial reporting, control, and performance evaluation.

Prerequisite(s): ACCT 5002.

### **ACCT 5014 [0.25 credit]**

#### **Governance and Accountability**

Corporate governance functions including management and controllership, boards of directors, auditors, security commissions and the control of enterprise-wide risk management. Historical development and evaluation of current practices, including Sarbanes Oxley and its implications.

### **ACCT 5120 [0.5 credit]**

#### **Advanced Concepts**

An in-depth exploration of selected topics in financial accounting, assurance and taxation.

Includes: Experiential Learning Activity

### **ACCT 5121 [0.5 credit]**

#### **Advanced Concepts II**

An in-depth exploration of selected topics in management accounting, finance and corporate governance.

### **ACCT 5122 [0.25 credit]**

#### **Issues in Taxation**

This course will provide students additional knowledge in Canadian Federal Taxation required in the MAcc program. Emphasis on corporate income tax and some specialized topics.

Prerequisite(s): permission of the M.Acc. office.

### **ACCT 5123 [0.5 credit]**

#### **Advanced Taxation**

Canadian taxation planning issues regarding personal and business decisions involving individuals, corporations, partnerships and trusts.

Includes: Experiential Learning Activity

**ACCT 5124 [0.25 credit]****Data Analytics for Professional Accountants**

Data and information analysis with application to professional accounting.

**ACCT 5125 [0.5 credit]****Advanced Assurance**

Assurance concepts are applied to a range of assurance and auditing engagements, including auditing financial statements and non-financial statement assurance engagements. Current trends in assurance are also explored.

Includes: Experiential Learning Activity

**ACCT 5128 [0.25 credit]****Strategy for Professional Accountants**

Overview of the strategy process required of professional accountants. Case-based course with accounting focus, exploring the development of a company's situation analysis, identification and analysis of strategic and operational issues.

Includes: Experiential Learning Activity

**ACCT 5129 [0.25 credit]****Professional Accounting Cases I**

An introduction to approaching, planning and writing accounting cases, including integration across multiple disciplines.

Includes: Experiential Learning Activity

**ACCT 5130 [0.5 credit]****Advanced Finance**

The impact of the financing decision upon the value of the firm, firm valuation, investing and risk management.

**ACCT 5131 [0.5 credit]****Performance Management**

Exploration of performance management in evaluating organizational performance, management decision making, effective problem solving skills and making recommendations for improvements to organizational operations.

Includes: Experiential Learning Activity

**ACCT 5134 [0.5 credit]****Advanced Integration I**

Discussion, analysis and integration with an emphasis on the application of strategic management to various accounting and finance issues.

Includes: Experiential Learning Activity

Precludes additional credit for ACCT 5133 (no longer offered).

Prerequisite(s): ACCT 5128. Completion of a minimum of 2.0 credits in the Master of Accounting program with a minimum average grade of B-.

**ACCT 5136 [0.5 credit]****Advanced Integration II**

Discussion, analysis and integration of issues involving financial reporting, assurance, finance, management accounting, taxation and/or strategy.

Includes: Experiential Learning Activity

Precludes additional credit for ACCT 5135 (no longer offered).

Prerequisite(s): ACCT 5134.

**ACCT 5137 [0.25 credit]****Professional Accounting Cases II**

A continued development and honing of problem solving abilities when placed in real-life, business situations.

Case-writing skills will be finessed, with focus on analysis and integration, while keeping the big picture in mind.

Includes: Experiential Learning Activity

Prerequisite(s): ACCT 5120 and ACCT 5121.

**ACCT 5199 [1.0 credit]****Internship**

Application of M.Acc. course knowledge and building management skills in a professional environment.

Minimum 480 hours. Graded Sat/Uns.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the M.Acc. office.

## African Studies

This section presents the requirements for programs in:

- M.A. Anthropology with Collaborative Specialization in African Studies
- M.A. Applied Linguistics and Discourse Studies with Collaborative Specialization in African Studies
- Master of Business Administration with Collaborative Specialization in African Studies
- M.A. Communication with Collaborative Specialization in African Studies
- M.A. Economics with Collaborative Specialization in African Studies
- M.A. English with Collaborative Specialization in African Studies
- M.A. Film Studies with Collaborative Specialization in African Studies
- M.A. Geography with Collaborative Specialization in African Studies
- M.A. History with Collaborative Specialization in African Studies
- M.A. International Affairs with Collaborative Specialization in African Studies
- M. Journalism with Collaborative Specialization in African Studies
- M.A. Legal Studies with Collaborative Specialization in African Studies
- M.A. Migration and Diaspora Studies with Collaborative Specialization in African Studies
- M.A. Music and Culture with Collaborative Specialization in African Studies
- M.A. Political Economy with Collaborative Specialization in African Studies
- M.A. Political Science with Collaborative Specialization in African Studies
- M.A. Sociology with Collaborative Specialization in African Studies
- M.A. Women's and Gender Studies with Collaborative Specialization in African Studies
- Ph.D. Anthropology with Collaborative Specialization in African Studies
- Ph.D. Architecture with Collaborative Specialization in African Studies
- Ph.D. English with Collaborative Specialization in African Studies
- Ph.D. International Affairs with Collaborative Specialization in African Studies
- Ph.D. Political Science with Collaborative Specialization in African Studies
- Ph.D. Sociology with Collaborative Specialization in African Studies

## Program Requirements

### M.A. Anthropology with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 0.5 credit in:</b>	0.5
ANTH 5401 [0.5]	Theory in Anthropology
<b>4. 0.5 credit in:</b>	0.5
ANTH 5402 [0.5]	Research in Anthropology
<b>5. 1.5 credits in</b> electives (see Note, below)	1.5
<b>6. 2.0 credits in:</b>	2.0
ANTH 5909 [2.0]	M.A. Thesis
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research Essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 0.5 credit in:</b>	0.5
ANTH 5401 [0.5]	Theory in Anthropology
<b>4. 0.5 credit in:</b>	0.5
ANTH 5402 [0.5]	Research in Anthropology
<b>5. 2.5 credits in</b> electives (see Note, below)	2.5
<b>6. 1.0 credit in:</b>	1.0
ANTH 5908 [1.0]	M.A. Research Essay
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 0.5 credit in:</b>	0.5
ANTH 5401 [0.5]	Theory in Anthropology
(Normally to be taken in the first fall term after admission to the program.)	
<b>4. 0.5 credit in:</b>	0.5
ANTH 5402 [0.5]	Research in Anthropology
<b>5. 0.5 credit from:</b>	0.5
ANTH 5109 [0.5]	Ethnography of Gender
ANTH 5209 [0.5]	Special Topics in Ethnography of Contemporary Africa
ANTH 5809 [0.5]	Special Topics in the Anthropology of Development
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies

- or an approved course in ANTH or SOCI approved by the Graduate Coordinator of the Institute of African Studies	
<b>6. 3.0 credits in</b> electives, including 0.5 credit in a course designated as having sufficient African Studies content	3.0

**Total Credits** **5.0**

### **M.A. Applied Linguistics and Discourse Studies with Collaborative Specialization in African Studies (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits)**

**1. 0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

**2. 0.0 credit in:** 0.0

AFRI 5800 [0.0] Scholarly Preparation in African Studies

**3. 1.0 credit in:** 1.0

ALDS 5001 [0.5] Directions in Applied Linguistics and Discourse Studies

ALDS 5002 [0.5] Inquiry Strategies in Applied Linguistics and Discourse Studies

**4. 1.5 credits from** any 5000-level ALDS course (in consultation with their advisor, students may take up to 1.0 credit in graduate courses from other programs at Carleton University or the University of Ottawa; up to 1.0 credit can be taken at the 4000 level; up to 1.5 credits can be taken in piggybacked courses) 1.5

**5. 2.0 credits in:** 2.0

ALDS 5909 [2.0] M.A. Thesis

**Total Credits** **5.0**

#### **Requirements - Research Essay pathway (5.0 credits)**

**1. 0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

**2. 0.0 credit in:** 0.0

AFRI 5800 [0.0] Scholarly Preparation in African Studies

**3. 1.0 credit in:** 1.0

ALDS 5001 [0.5] Directions in Applied Linguistics and Discourse Studies

ALDS 5002 [0.5] Inquiry Strategies in Applied Linguistics and Discourse Studies

**4. 2.5 credits from** any 5000-level ALDS course (in consultation with their advisor, students may take up to 1.0 credit in graduate courses from other programs at Carleton University or the University of Ottawa; up to 1.0 credit can be taken at the 4000 level; up to 1.5 credits can be taken in piggybacked courses) 2.5

**5. 1.0 credit in:** 1.0

ALDS 5908 [1.0] Research Essay

**Total Credits** **5.0**

### **Master of Business Administration with Collaborative Specialization in African Studies (8.5 credits)**

#### **Requirements:**

**1. 0.75 credit in:** 0.75

IBUS 5712 [0.25] Business and Government in Emerging Economies

AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
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**2. 0.0 credit in:** 0.0

AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
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**3. 1.5 credit in** elective specialization courses designated as having sufficient African Studies content, within the School of Business or elsewhere, with permission of African Studies and the School of Business. 1.5

**4. 4.25 credits in** compulsory core courses 4.25

**5. 1.0 credits in** elective courses 1.0

**6. 1.0 credit in:** 1.0

BUSI 5999 [1.0] Internship <sup>1</sup>

**7. 0.0 credit in:** 0.0

BUSI 5998 [0.0] MBA Skills Workshop <sup>2</sup>

**Total Credits** **8.5**

<sup>1</sup> Students with less than two (2) years of professional employment experience must successfully complete BUSI 5999 [1.0] Internship in order to graduate. Students with two or more years work experience may apply for an exemption.

<sup>2</sup> Non-credit required skills workshop.

### **M.A. Communication with Collaborative Specialization in African Studies (5.0 credits)**

#### **Requirements - Research Essay pathway (5.0 credits)**

**1. 0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

**2. 0.0 credit in:** 0.0

AFRI 5800 [0.0] Scholarly Preparation in African Studies

**3. 1.0 credit in:** 1.0

COMS 5101 [1.0] Foundations of Communication Studies

**4. 0.5 credit in:** 0.5

COMS 5605 [0.5] Approaches to Communication Research

**5. 1.0 credit in:** 1.0

COMS 5908 [1.0] Research Essay

**6. 2.0 credits** chosen from the list of optional courses. 2.0

**Total Credits** **5.0**

#### **Requirements - Thesis pathway (5.0 credits)**

**1. 0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

**2. 0.0 credit in:** 0.0

AFRI 5800 [0.0] Scholarly Preparation in African Studies

**3. 1.0 credit in:** 1.0

COMS 5101 [1.0] Foundations of Communication Studies

**4. 0.5 credit in:** 0.5

COMS 5605 [0.5] Approaches to Communication Research

**5. 2.0 credits in:** 2.0

COMS 5909 [2.0]	M.A. Thesis	
<b>6. 1.0 credits from the list of optional courses.</b>		<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>

## M.A. Economics with Collaborative Specialization in African Studies (4.0 credits)

### Requirements - Coursework pathway (4.0 credits)

<b>1. 1.5 credits in:</b>		<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>3. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
ECON 5029 [0.5]	Methods of Economic Research	
including a research paper on an African Studies topic approved by the Graduate Committee of the Institute of African Studies		
<b>5. 0.5 credit in</b>	African Studies elective approved by the M.A. Supervisor of the Department of Economics	<b>0.5</b>
<b>6. 1.0 credit in</b>	ECON approved by the M.A. Supervisor of the Department of Economics, including at least 0.5 credit from ECON 5500, ECON 5504, ECON 5505	<b>1.0</b>
<b>Total Credits</b>		<b>4.0</b>

### Requirements - Thesis pathway (4.0 credits)

<b>1. 1.5 credits in:</b>		<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>3. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>4. 1.5 credit in:</b>		<b>1.5</b>
ECON 5909 [1.5]	M.A. Thesis	
on an African Studies topic approved by the Graduate Committee of the Institute of African Studies		
<b>5. 0.5 credit from:</b>		<b>0.5</b>
ECON 5500 [0.5]	Development Economics I	
ECON 5504 [0.5]	Development Economics II	
ECON 5505 [0.5]	Selected Topics in Development Economics	
<b>Total Credits</b>		<b>4.0</b>

## M.A. English with Collaborative Specialization in African Studies (4.5 credits)

### Requirements - Coursework pathway (4.5 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	

<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	

<b>3. 0.5 credit from:</b>		<b>0.5</b>
ENGL 5008 [0.5]	Studies in African Literature	
ENGL 5010 [0.5]	Studies in Caribbean Literature	
Or an ENGL course approved by the Graduate Coordinator of the Institute of African Studies		

<b>4. 0.5 credit in:</b>		<b>0.5</b>
ENGL 5005 [0.5]	M.A. Seminar	
<b>5. 3.0 credits in ENGL</b>	at the 5000 level (excluding ENGL 5908 and ENGL 5909)	<b>3.0</b>

<b>Total Credits</b>		<b>4.5</b>
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### Requirements - Research Essay pathway (4.5 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
ENGL 5008 [0.5]	Studies in African Literature	
ENGL 5010 [0.5]	Studies in Caribbean Literature	
Or an ENGL course approved by the Graduate Coordinator of the Institute of African Studies		
<b>4. 0.5 credit in:</b>		<b>0.5</b>
ENGL 5005 [0.5]	M.A. Seminar	
<b>5. 2.0 credits in ENGL</b>	at the 5000 level (excluding ENGL 5909)	<b>2.0</b>
<b>6. 1.0 credit in:</b>		<b>1.0</b>
ENGL 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

### Requirements - Thesis pathway (4.5 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
ENGL 5008 [0.5]	Studies in African Literature	
ENGL 5010 [0.5]	Studies in Caribbean Literature	
Or an ENGL course approved by the Graduate Coordinator of the Institute of African Studies		
<b>4. 0.5 credit in:</b>		<b>0.5</b>
ENGL 5005 [0.5]	M.A. Seminar	
<b>5. 1.0 credit in ENGL</b>	at the 5000 level (excluding ENGL 5908)	<b>1.0</b>
<b>6. 2.0 credits in:</b>		<b>2.0</b>
ENGL 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

## M.A. Film Studies with Collaborative Specialization in African Studies (4.0 credits)

### Requirements - Thesis Stream (4.0 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
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AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	
<b>4. 1.0 credit in</b> Film Studies graduate course work, excluding FILM 5801		<b>1.0</b>
<b>5. 1.5 credits in:</b>		<b>1.5</b>
FILM 5909 [1.5]	M.A. Thesis	
<b>Total Credits</b>		<b>4.0</b>
<b>Requirements - Research Essay Stream (4.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	
<b>4. 1.5 credits in</b> Film Studies graduate course work, 0.5 credit of which can include:		<b>1.5</b>
FILM 5801 [0.5]	Graduate Internship	
<b>5. 1.0 credit in:</b>		<b>1.0</b>
FILM 5908 [1.0]	Research Essay	
<b>Total Credits</b>		<b>4.0</b>
<b>Requirements - Coursework Stream (4.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	
<b>4. 1.5 credits in</b> Film Studies graduate course work, 0.5 credit of which can include:		<b>1.5</b>
FILM 5801 [0.5]	Graduate Internship	
<b>5. 1.0 credit from:</b>		<b>1.0</b>
AFRI 5050 [0.5]	Selected Topics in African Studies	
AFRI 5100 [0.5]	African Studies Abroad	
AFRI 5700 [0.5]	Directed Readings in African Studies	
Students may also take courses designated as having sufficient African Studies content, as approved by both the Graduate Supervisor in Film Studies and the Graduate Coordinator of the Institute of African Studies.		
<b>Total Credits</b>		<b>4.0</b>

**Note:** for **Item 4** above, students may take a 0.5 credit Film Studies course at the 4000-level subject to the approval of the Graduate Supervisor

### M.A. Geography with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
GEOG 5000 [0.5]	Approaches to Geographical Inquiry	
GEOG 5905 [0.5]	Masters Research Workshop	
<b>4. 2.5 credits in:</b>		<b>2.5</b>
GEOG 5909 [2.5]	M.A. Thesis (in the specialization and including oral examination of the thesis)	
<b>5. 1.0 credit in</b> approved graduate-level electives		<b>1.0</b>
6. In addition to the formal requirements, MA students are required to attend the Departmental Seminar series, and the Graduate Field Camp.		
<b>Total Credits</b>		<b>5.0</b>

### M.A. History with Collaborative Specialization in African Studies (4.5 credits)

#### Requirements - Research Essay pathway (4.5 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
HIST 5003 [0.5]	Historical Theory and Method	
<b>4. 2.0 credits in</b> HIST at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.		<b>2.0</b>
<b>5. 0.5 credit in:</b>		<b>0.5</b>
HIST 5900 [0.5]	Directed Research	
<b>6. 1.0 credit in:</b>		<b>1.0</b>
HIST 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

#### Requirements - Thesis pathway (4.5 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	

<b>3. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]      Historical Theory and Method	
<b>4. 1.5 credits in HIST</b> at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.5
<b>5. 2.0 credits in:</b>	2.0
HIST 5909 [2.0]      M.A. Thesis (in the specialization)	
<b>Total Credits</b>	<b>4.5</b>

### M.A. International Affairs with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]      African Studies as a Discipline: Historical and Current Perspectives	
AFRI 5800 [0.0]      Scholarly Preparation in African Studies	
<b>2. 1.5 credit in:</b>	1.5
INAF 5015 [0.5]      Research Design and Methods for International Affairs	
INAF 5016 [0.5]      Statistical Analysis for International Affairs	
INAF 5017 [0.25]      International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]      Law and International Affairs	
<b>3. 0.5 credit in economics</b> , successfully completed by the end of the second term, from (See Note 1, below):	0.5
INAF 5009 [0.5]      International Aspects of Economic Development	
INAF 5205 [0.5]      Economics of Conflict	
INAF 5214 [0.5]      Economics for Defence and Security	
INAF 5308 [0.5]      International Trade: Theory and Policy	
INAF 5309 [0.5]      International Finance: Theory and Policy	
INAF 5600 [0.5]      The Economics of Human Development	
INAF 5703 [0.5]      International Public Economics	
<b>4. 2.0 credits in:</b>	2.0
INAF 5909 [2.0]      M.A. Thesis (in the specialization)	
<b>5. 0.5 credit in Field and Elective courses</b> (see Note 2, below)	0.5
6. Successful completion of second language proficiency examination (See Note 3, below)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]      African Studies as a Discipline: Historical and Current Perspectives	
AFRI 5800 [0.0]      Scholarly Preparation in African Studies	
<b>2. 1.5 credit in:</b>	1.5
INAF 5015 [0.5]      Research Design and Methods for International Affairs	

INAF 5016 [0.5]      Statistical Analysis for International Affairs	
INAF 5017 [0.25]      International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]      Law and International Affairs	
<b>3. 0.5 credit in economics</b> , successfully completed by the end of the second term, from: (See Note 1, below)	0.5
INAF 5009 [0.5]      International Aspects of Economic Development	
INAF 5214 [0.5]      Economics for Defence and Security	
INAF 5205 [0.5]      Economics of Conflict	
INAF 5308 [0.5]      International Trade: Theory and Policy	
INAF 5309 [0.5]      International Finance: Theory and Policy	
INAF 5600 [0.5]      The Economics of Human Development	
INAF 5703 [0.5]      International Public Economics	
<b>4. 1.0 credit in:</b>	1.0
INAF 5908 [1.0]      Research Essay (in the specialization)	
<b>5. 1.5 credits in Field and Elective courses</b> (See Note 2, below)	1.5
6. Successful completion of second language proficiency examination (see Note 3, below)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]      African Studies as a Discipline: Historical and Current Perspectives	
AFRI 5800 [0.0]      Scholarly Preparation in African Studies	
<b>2. 1.0 credit in:</b>	1.0
INAF 5016 [0.5]      Statistical Analysis for International Affairs	
INAF 5017 [0.25]      International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]      Law and International Affairs	
<b>3. 0.5 credit in economics</b> , successfully completed by the end of the second term, from: (See Note 1, below)	0.5
INAF 5009 [0.5]      International Aspects of Economic Development	
INAF 5205 [0.5]      Economics of Conflict	
INAF 5214 [0.5]      Economics for Defence and Security	
INAF 5308 [0.5]      International Trade: Theory and Policy	
INAF 5309 [0.5]      International Finance: Theory and Policy	
INAF 5600 [0.5]      The Economics of Human Development	
INAF 5703 [0.5]      International Public Economics	

**4. 1.0 credit in** courses accepted by the Institute of African Studies Graduate Coordinator as having sufficient African content and accepted by the NPSIA M.A. Program Supervisor or Associate Director as being relevant to the student's program of study. These courses would normally be drawn from the social science courses listed under the collaborative program. In years that it is offered, it is strongly suggested that NPSIA students include INAF 5603.

**5. 2.0 credits in** Field and Elective courses (See Note 2, below)

6. Successful completion of second language proficiency examination (see Note 3, below)

**Total Credits 5.0**

1. All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309, or approved equivalent, must be completed.
2. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.
3. Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Details of the language requirement are provided on the School website.

## M. Journalism with Collaborative Specialization in African Studies (8.0 credits)

### M. Journalism with Collaborative Specialization in African Studies (Professional Practice pathway)

#### First Year requirements:

Students must complete the following courses before proceeding to the second year of study:

**1. 0.5 credit in:** 0.5  
AFRI 5000 [0.5] African Studies as a Discipline:  
Historical and Current Perspectives

**2. 0.0 credit in:**  
AFRI 5800 [0.0] Scholarly Preparation in African  
Studies

**3. 4.0 credits in:** 4.0  
JOUR 5000 [0.5] Journalism in a Changing Society  
JOUR 5002 [0.5] Journalism, Race and Diversity  
JOUR 5200 [1.0] Introduction to Reporting  
JOUR 5202 [1.0] Broadcast Journalism Laboratory  
JOUR 5401 [0.5] Journalism Law  
JOUR 5706 [0.5] In-Depth Reporting Seminar

**4. 0.5 credit in** approved African Studies electives 0.5

**5. 0.5 credit in** electives chosen in consultation with the Supervisor of Graduate Studies 0.5

#### Second Year requirements:

**6. 1.0 credit in:** 1.0

JOUR 5908 [1.0] M. Journalism Research Project (in the specialization)

**7. 0.5 credit in:** 0.5  
JOUR 5001 [0.5] Entrepreneurial Journalism

**8. 0.5 credit from:** 0.5  
JOUR 5003 [0.5] Advanced Journalism: Multimedia  
JOUR 5004 [0.5] Advanced Journalism: Audio  
JOUR 5005 [0.5] Advanced Journalism: Video

**9. 0.5 credit from:** 0.5  
JOUR 5300 [0.5] Specialized Journalism: Special Topic

JOUR 5301 [0.5] Specialized Journalism: Business and the Markets

JOUR 5302 [0.5] Specialized Journalism: Business and Canadian Society

JOUR 5303 [0.5] Specialized Journalism: Health and Science

JOUR 5304 [0.5] Specialized Journalism: Environment and Science

JOUR 5306 [0.5] Specialized Journalism: Canada and the World

JOUR 5308 [0.5] Specialized Journalism: Sports and Sport Culture

JOUR 5309 [0.5] Specialized Journalism: Arts and Culture

JOUR 5311 [0.5] Specialized Journalism: Justice and The Supreme Court

JOUR 5313 [0.5] Specialized Journalism: Reporting in Indigenous Communities

JOUR 5314 [0.5] Specialized Journalism: Parliament, Policy and the Press

JOUR 5315 [0.5] Specialized Journalism: Canada and the U.S.

Note: As a condition of graduation, students normally are required to acquire a minimum of eight weeks practical experience in the media. For qualified applicants, the program may deem the requirement to have been met.

**Total Credits 8.0**

### M. Journalism with Collaborative Specialization in African Studies (Journalism Studies pathway)

#### First Year requirements:

Students must complete the following courses before proceeding to the second year of study:

**1. 0.5 credit in:** 0.5  
AFRI 5000 [0.5] African Studies as a Discipline:  
Historical and Current Perspectives

**2. 0.0 credit in:**  
AFRI 5800 [0.0] Scholarly Preparation in African  
Studies

**3. 4.0 credits in:** 4.0  
JOUR 5000 [0.5] Journalism in a Changing Society  
JOUR 5002 [0.5] Journalism, Race and Diversity  
JOUR 5200 [1.0] Introduction to Reporting  
JOUR 5202 [1.0] Broadcast Journalism Laboratory  
JOUR 5401 [0.5] Journalism Law  
JOUR 5706 [0.5] In-Depth Reporting Seminar

**4. 0.5 credit in** electives chosen in consultation with the Supervisor of Graduate Studies 0.5

#### Second Year requirements:

**5. 1.0 credits in** electives chosen in consultation with the Supervisor of Graduate Studies 1.0

**6. 2.0 credits in:** 2.0  
 JOUR 5909 [2.0] M. Journalism Thesis (in the specialization)

**Total Credits** 8.0

### **M. Journalism with Collaborative Specialization in African Studies (Advanced entry - 5.0 credits)**

**M. Journalism with Collaborative Specialization in African Studies (Professional Practice pathway, advanced entry)**

#### **Requirements:**

**1. 0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

**2. 0.0 credit in:**

AFRI 5800 [0.0] Scholarly Preparation in African Studies

**3. 1.0 credit in:** 1.0

JOUR 5000 [0.5] Journalism in a Changing Society  
 JOUR 5002 [0.5] Journalism, Race and Diversity

**4. 0.5 credit from:** 0.5

JOUR 5003 [0.5] Advanced Journalism: Multimedia  
 JOUR 5004 [0.5] Advanced Journalism: Audio  
 JOUR 5005 [0.5] Advanced Journalism: Video

**5. 0.5 credit from:** 0.5

JOUR 5300 [0.5] Specialized Journalism: Special Topic

JOUR 5301 [0.5] Specialized Journalism: Business and the Markets

JOUR 5302 [0.5] Specialized Journalism: Business and Canadian Society

JOUR 5303 [0.5] Specialized Journalism: Health and Science

JOUR 5304 [0.5] Specialized Journalism: Environment and Science

JOUR 5306 [0.5] Specialized Journalism: Canada and the World

JOUR 5308 [0.5] Specialized Journalism: Sports and Sport Culture

JOUR 5309 [0.5] Specialized Journalism: Arts and Culture

JOUR 5311 [0.5] Specialized Journalism: Justice and The Supreme Court

JOUR 5313 [0.5] Specialized Journalism: Reporting in Indigenous Communities

JOUR 5314 [0.5] Specialized Journalism: Parliament, Policy and the Press

JOUR 5315 [0.5] Specialized Journalism: Canada and the U.S.

**6. 1.5 credits in** electives chosen in consultation with the Supervisor of Graduate Studies 1.5

**7. 1.0 credit in:** 1.0

JOUR 5908 [1.0] M. Journalism Research Project (in the specialization)

Note: As a condition of graduation, students normally are required to acquire a minimum of eight weeks practical experience in the media. For qualified applicants, the program may deem the requirement to have been met.

**Total Credits** 5.0

### **M. Journalism with Collaborative Specialization in African Studies (Journalism Studies pathway, advanced entry)**

#### **Requirements:**

**1. 0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

**2. 0.0 credit in:**

AFRI 5800 [0.0] Scholarly Preparation in African Studies

**3. 0.5 credit in:** 0.5

JOUR 5000 [0.5] Journalism in a Changing Society

**4. 2.0 credits in** electives chosen in consultation with the Supervisor of Graduate Studies 2.0

**5. 2.0 credits in:** 2.0

JOUR 5909 [2.0] M. Journalism Thesis (in the specialization)

**Total Credits** 5.0

### **M.A. Legal Studies with Collaborative Specialization in African Studies (5.0 credits)**

#### **Requirements - Thesis pathway**

**1. 0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

**2. 1.0 credit in:** 1.0

LAWS 5000 [0.5] Theories of Law and Social Transformation

LAWS 5001 [0.5] Legal Method and Social Inquiry

**3. 0.0 credit in:**

AFRI 5800 [0.0] Scholarly Preparation in African Studies

**4. 1.5 credits in LAWS** 1.5

**5. 2.0 credits in:** 2.0

LAWS 5909 [2.0] M.A. Thesis (in the specialization, including an oral examination. See Note, below)

**Total Credits** 5.0

#### **Requirements - Research essay pathway (5.0 credits)**

**1. 0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

**2. 0.0 credit in:** 0.0

AFRI 5800 [0.0] Scholarly Preparation in African Studies

**3. 1.0 credit in:** 1.0

LAWS 5000 [0.5] Theories of Law and Social Transformation

LAWS 5001 [0.5] Legal Method and Social Inquiry

**4. 2.5 credits in LAWS** 2.5

**5. 1.0 credit in:** 1.0

LAWS 5908 [1.0]	M.A. Research Essay (in the specialization. See Note, below)
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<b>Total Credits</b>	<b>5.0</b>
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Note: Thesis/Research Essay: The thesis or research essay must represent the result of the candidate's independent research undertaken after being admitted into graduate studies in the Department of Law and Legal Studies. Previous work of the candidate may be used only as introductory or background material for the thesis or research essay. A student may carry on research work related to the thesis or research essay off campus if the work is approved in advance and supervision arrangements have been made with the supervisor of graduate studies.

### M.A. Migration and Diaspora Studies with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis Pathway:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 1.0 credit in:</b>	<b>1.0</b>
MGDS 5001 [0.5]	MA Core Seminar: Migration and Diaspora Studies
MGDS 5003 [0.5]	Research Seminar in Migration and Diaspora Studies
<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	<b>0.5</b>
<b>5. 1.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 0.5 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	<b>1.0</b>
<b>6. 2.0 credits in:</b>	
MGDS 5909 [2.0]	M.A. Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research Essay Pathway:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 1.0 credit in:</b>	<b>1.0</b>
MGDS 5001 [0.5]	MA Core Seminar: Migration and Diaspora Studies
MGDS 5003 [0.5]	Research Seminar in Migration and Diaspora Studies
<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	<b>0.5</b>
<b>5. 2.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	<b>2.0</b>
<b>6. 1.0 credit in:</b>	<b>1.0</b>

MGDS 5908 [1.0]	Research Essay
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework Pathway

<b>1. 0.5 credit in:</b>	<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 1.0 credit in:</b>	<b>1.0</b>
MGDS 5001 [0.5]	MA Core Seminar: Migration and Diaspora Studies
MGDS 5003 [0.5]	Research Seminar in Migration and Diaspora Studies
<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	<b>0.5</b>
<b>5. 2.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	<b>2.0</b>
<b>6. 1.0 credits in</b> course(s) designated as having sufficient African Studies content, approved by both the MDS Program Director and the Director of African Studies.	<b>1.0</b>
<b>Total Credits</b>	<b>5.0</b>

### M.A. Music and Culture with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credits in:</b>	<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture
<b>2. 1.5 credit in</b> additional MUSI course work chosen from available electives	<b>1.5</b>
<b>3. 2.0 credits in:</b>	<b>2.0</b>
MUSI 5909 [2.0]	M.A. Thesis
<b>4. 0.5 credit in:</b>	<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>5. 0.0 credit in:</b>	<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Research essay pathway (5.0 credits)

<b>1. 1.0 credits in:</b>	<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture
<b>2. 2.5 credits in</b> additional MUSI course work chosen from available elective courses	<b>2.5</b>
<b>3. 1.0 credit in:</b>	<b>1.0</b>
MUSI 5908 [1.0]	Research Essay
<b>4. 0.5 credit in:</b>	<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>5. 0.0 credit in:</b>	<b>0.0</b>

AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>		
<b>1. 1.0 credits in:</b>		<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.5 credits in</b>	additional MUSI course work chosen from available elective courses	<b>2.5</b>
<b>3. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>5. 1.0 credit from:</b>		<b>1.0</b>
AFRI 5050 [0.5]	Selected Topics in African Studies	
AFRI 5100 [0.5]	African Studies Abroad	
AFRI 5700 [0.5]	Directed Readings in African Studies	
AFRI 5900 [0.5]	Placement	
ANTH 5109 [0.5]	Ethnography of Gender	
ANTH 5209 [0.5]	Special Topics in Ethnography of Contemporary Africa	
ANTH 5809 [0.5]	Special Topics in the Anthropology of Development	
ENGL 5008 [0.5]	Studies in African Literature	
ENGL 5010 [0.5]	Studies in Caribbean Literature	
FREN 5212 [0.5]	Littératures francophones	
INAF 5603 [0.5]	Issues in Development in Africa	
LAWS 5007 [0.5]	Race, Ethnicity and the Law	
LAWS 5603 [0.5]	International Law: Theory and Practice	
PSCI 5107 [0.5]	Globalization, Adjustment and Democracy in Africa	
PSCI 5202 [0.5]	Development Theory and Issues	
PSCI 5203 [0.5]	Southern Africa After Apartheid	
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies	
WGST 5902 [0.5]	Advanced Topics in Women's and Gender Studies II	
<b>Total Credits</b>		<b>5.0</b>

### M.A. Political Economy with Collaborative Specialization in African Studies (5.0 credits)

<b>Requirements - Thesis pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 2.0 credits in:</b>		<b>2.0</b>

PECO 5909 [2.0]	M.A. Thesis (in the specialization, including an oral examination in the thesis)	
<b>5. 1.5 credits in</b>	approved graduate level electives (see Selection of Courses, below) <sup>1</sup>	<b>1.5</b>
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
PECO 5908 [1.0]	Research Essay (in the specialization)	
<b>5. 2.5 credits in</b>	approved graduate level electives (see Selection of Courses, below) <sup>1</sup>	<b>2.5</b>
<b>Total Credits</b>		<b>5.0</b>

<sup>1</sup> Up to one (1.0) credit may be taken at the 4000 (honours undergraduate) level.

### M.A. Political Science with Collaborative Specialization in African Studies (5.0 credits)

<b>Requirements - Coursework pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
PSCI 5107 [0.5]	Globalization, Adjustment and Democracy in Africa	
PSCI 5203 [0.5]	Southern Africa After Apartheid	
PSCI 5600 [0.5]	Africa's International Relations	
<b>4. 0.5 credit in</b>	course designated as having sufficient African Studies content, approved by both the Graduate Supervisor in Political Science and the Graduate Coordinator of the Institute of African Studies	<b>0.5</b>
<b>5. 3.5 credits in</b>	approved courses	<b>3.5</b>
<b>Total Credits</b>		<b>5.0</b>

<b>Requirements - Research essay pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
PSCI 5107 [0.5]	Globalization, Adjustment and Democracy in Africa	
PSCI 5203 [0.5]	Southern Africa After Apartheid	

PSCI 5600 [0.5]	Africa's International Relations	
<b>4. 0.5 credit in</b>	course designated as having sufficient African Studies content, approved by both the Graduate Supervisor in Political Science and the Graduate Coordinator of the Institute of African Studies	0.5
<b>5. 1.0 credit in:</b>		1.0
PSCI 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>6. 2.5 credits in</b>	approved courses	2.5
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit from:</b>		0.5
PSCI 5107 [0.5]	Globalization, Adjustment and Democracy in Africa	
PSCI 5203 [0.5]	Southern Africa After Apartheid	
PSCI 5600 [0.5]	Africa's International Relations	
<b>4. 0.5 credit in</b>	course designated as having sufficient African Studies content, approved by both the Graduate Supervisor in Political Science and the Graduate Coordinator of the Institute of African Studies	0.5
<b>5. 2.0 credits in:</b>		2.0
PSCI 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>6. 1.5 credits in</b>	approved courses	1.5
<b>Total Credits</b>		<b>5.0</b>

### M.A. Sociology with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

<b>1. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>2. 1.5 credits in</b>	courses. With departmental permission 0.5 credit may be selected from courses at the 4000-level.	1.5
<b>3. 2.0 credits in:</b>		2.0
SOCI 5909 [2.0]	M.A. Thesis	
<b>4. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>5. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies (5. 0.0 credit in:)	
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Research Essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>2. 2.5 credits in</b>	courses. With departmental permission 0.5 credit may be selected from courses at the 4000-level.	2.5
<b>3. 1.0 credit in:</b>		1.0

SOCI 5908 [1.0]	M.A. Research Essay	
<b>4. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>5. 0.0 credit in:</b>		0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>6. An oral examination on the candidate's research essay and program.</b>		
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>2. 2.5 credits in</b>	courses excluding SOCI 5905. With departmental permission 0.5 credit may be selected from courses at the 4000-level.	2.5
<b>3. 1.0 credit in</b>	courses designated as having sufficient African Studies content, including at least 0.5 credit in:	1.0
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies	
ANTH 5109 [0.5]	Ethnography of Gender	
ANTH 5209 [0.5]	Special Topics in Ethnography of Contemporary Africa	
ANTH 5809 [0.5]	Special Topics in the Anthropology of Development	

Or, a Sociology or Anthropology course approved by the Graduate Coordinator of the Institute of African Studies.

<b>4. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>5. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>Total Credits</b>		<b>5.0</b>

### M.A. Women's and Gender Studies with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>		0.5
WGST 5900 [0.5]	Program Seminar	
<b>4. 0.5 credit in:</b>		0.5
WGST 5906 [0.5]	Feminist Theory	
<b>5. 0.5 credit in:</b>		0.5
WGST 5907 [0.5]	Researching Women's and Gender Issues	
<b>6. 1.0 credit in</b>	additional course work chosen from available elective courses (see below)	1.0
<b>7. 2.0 credits in:</b>		2.0

WGST 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
WGST 5900 [0.5]	Program Seminar	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
WGST 5906 [0.5]	Feminist Theory	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
WGST 5907 [0.5]	Researching Women's and Gender Issues	
<b>6. 2.0 credits in</b>	additional course work chosen from available elective courses (see below)	<b>2.0</b>
<b>7. 1.0 credit in:</b>		<b>1.0</b>
WGST 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### Ph.D. Anthropology with Collaborative Specialization in African Studies (3.0 credits)

#### Requirements - Standard Admission:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
ANTH 6000 [1.0]	Doctoral Seminar: Theory and Method in Contemporary Anthropology	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
ANTH 6002 [0.5]	Research Design	
<b>6. 0.0 credit in</b>	(two terms satisfactory participation in):	
ANTH 6100 [0.0]	Thesis Writing Seminar	
<b>7. 0.5 credit in</b>	SOCI or ANTH courses at the 5000 or 6000 level	<b>0.5</b>
8. A satisfactory research preparation portfolio		
9. A satisfactory thesis proposal and (when required) Research Ethics Board clearance to undertake this research		
10. Satisfactory thesis research		
<b>11. 0.0 credit in:</b>		
ANTH 6909 [0.0]	Ph.D. Thesis (in the specialization, including successful oral defence))	
<b>Total Credits</b>		<b>3.0</b>

### Ph.D. Anthropology with Collaborative Specialization in African Studies (Advanced Completion Option - 2.5 credits)

Applicants to the Ph.D. Anthropology with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies may be considered for admission to an advanced completion option of the Ph.D.

#### Requirements - Standard Admission:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
ANTH 6000 [1.0]	Doctoral Seminar: Theory and Method in Contemporary Anthropology	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
ANTH 6002 [0.5]	Research Design	
<b>4. 0.0 credit in</b>	(two terms satisfactory participation in):	
ANTH 6100 [0.0]	Thesis Writing Seminar	
<b>5. 0.5 credit in</b>	SOCI or ANTH courses at the 5000 or 6000 level	<b>0.5</b>
6. A satisfactory research preparation portfolio		
7. A satisfactory thesis proposal and (when required) Research Ethics Board clearance to undertake this research		
8. Satisfactory thesis research		
<b>9. 0.0 credit in:</b>		
ANTH 6909 [0.0]	Ph.D. Thesis (in the specialization, including successful oral defence))	
<b>Total Credits</b>		<b>2.5</b>

### Ph.D. Architecture with Collaborative Specialization in African Studies (6.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

<b>1. 2.5 credits in</b>	core courses	<b>2.5</b>
ARCN 6001 [0.5]	Workshop: Design as Research I	
ARCH 6001 [0.5]	Texts, Precedents and Writings in Architecture I	
ARCH 6103 [0.5]	Colloquium I: Architectural Research Methods	
ARCH 6104 [0.5]	Colloquium II: Architectural Research Presentation	
ARCH 6105 [0.5]	Colloquium III: Architectural Research Dissemination	
<b>2. 2.0 credits in:</b>		<b>2.0</b>
ARCH 6907 [1.0]	Ph.D. Comprehensive Examination	
ARCH 6908 [1.0]	Ph.D. Proposal Examination	
<b>3. 0.0 credit in:</b>		

ARCH 6909 [0.0]	Ph.D. Dissertation (Includes oral defence. Thesis must be related to African Studies and will be supervised by a faculty member with expertise in Africa and Africa related research in the primary unit. It may also be co-supervised by an IAS faculty member. )	
<b>4. 1.0 credits in:</b>		<b>1.0</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>5. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>6. 0.5 credit in free elective at the 5000-level in any discipline.</b>		<b>0.5</b>
<b>Total Credits</b>		<b>6.0</b>

### Ph.D. English with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
ENGL 6003 [0.5]	Theories and Foundations in the Production of Literature	
ENGL 6004 [0.5]	Approaches to the Production of Literature	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
ENGL 6002 [0.5]	Proseminar	
<b>6. 1.0 credit in approved courses</b>		<b>1.0</b>
<b>7. 1.0 credit in:</b>		<b>1.0</b>
ENGL 6900 [1.0]	Comprehensive Examination	
<b>8. 0.5 credit in:</b>		<b>0.5</b>
ENGL 6902 [0.5]	Dissertation Proposal	
<b>9. Language requirement:</b>		
Satisfactory demonstration of an understanding of a language other than English. Contact the Department for details.		
<b>10. 0.0 credit in:</b>		
ENGL 6909 [0.0]	Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### Ph.D. English with Collaborative Specialization in African Studies (Advanced Completion - 4.5 credits)

Applicants to the Ph.D. English with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies

may be considered for admission to an Advanced Completion Option of the Ph.D.

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
ENGL 6003 [0.5]	Theories and Foundations in the Production of Literature	
ENGL 6004 [0.5]	Approaches to the Production of Literature	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
ENGL 6002 [0.5]	Proseminar	
<b>4. 1.0 credit in approved courses</b>		<b>1.0</b>
<b>5. 1.0 credit in:</b>		<b>1.0</b>
ENGL 6900 [1.0]	Comprehensive Examination	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
ENGL 6902 [0.5]	Dissertation Proposal	
<b>7. Language requirement:</b>		
Satisfactory demonstration of an understanding of a language other than English. Contact the Department for details.		
<b>8. 0.0 credit in:</b>		
ENGL 6909 [0.0]	Thesis (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

### Ph.D. International Affairs with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Standard Admission:

<b>1. 1.5 credits in:</b>		<b>1.5</b>
INAF 6001 [0.5]	Qualitative Research Methods	
INAF 6002 [0.5]	Quantitative Research Methods	
INAF 6003 [0.5]	Advanced International Policy Analysis	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
INAF 6005 [0.0]	Doctoral Research Seminar	
<b>3. 0.5 credit in required INAF economics course for the declared field listed above (see Note)</b>		<b>0.5</b>
<b>4. 1.0 credit in courses in the declared field</b>		<b>1.0</b>
<b>5. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>6. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>7. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>8. Doctoral students must successfully complete an examination in a second language administered by the School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Students are expected to complete this requirement or demonstrate significant progress by the end of their fourth term.</b>		
<b>9. 0.5 credit in: doctoral research seminar and public defence of the doctoral research prospectus</b>		<b>0.5</b>

INAF 6906 [0.5]	Doctoral Research Prospectus Seminar and Defence	
<b>10. 0.0 credit in:</b>		<b>0.0</b>
INAF 6909 [0.0]	Doctoral Research Thesis (in the Specialization)	
<b>Total Credits</b>		<b>5.0</b>

**Note:** students without strong economics training may be required to complete additional INAF economics courses.

### Ph.D. International Affairs with Collaborative Specialization in African Studies (Advanced Completion Option - 4.5 credits)

Applicants to the Ph.D. International Affairs with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies may be considered for admission to an Advanced Completion Option of the Ph.D.

#### Requirements - Advanced Completion Option:

<b>1. 1.5 credits in:</b>		<b>1.5</b>
INAF 6001 [0.5]	Qualitative Research Methods	
INAF 6002 [0.5]	Quantitative Research Methods	
INAF 6003 [0.5]	Advanced International Policy Analysis	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
INAF 6005 [0.0]	Doctoral Research Seminar	
<b>3. 0.5 credit in</b>	required INAF economics course for the declared field listed below (see Note, below)	<b>0.5</b>
<b>4. 1.0 credit in</b>	courses in the declared field	<b>1.0</b>
<b>5. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
6. Doctoral students must successfully complete an examination in a second language administered by the School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Students are expected to complete this requirement or demonstrate significant progress by the end of their fourth term.		
<b>7. 0.5 credit in:</b>	doctoral research seminar and public defence of the doctoral research prospectus	<b>0.5</b>
INAF 6906 [0.5]	Doctoral Research Prospectus Seminar and Defence	
<b>8. 0.0 credit in:</b>		<b>0.0</b>
INAF 6909 [0.0]	Doctoral Research Thesis (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

**Note:** students without strong economics training may be required to complete additional INAF economics courses.

### Ph.D. Political Science with Collaborative Specialization in African Studies (5.5 credits)

#### Requirements:

<b>1. 2.0 credits in</b>	courses at the 6000 level in each of the candidate's two major fields of study. A GPA of 9.0 or higher must be obtained in these courses for students to be allowed to proceed to the comprehensive examinations.	<b>2.0</b>
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<b>2. 1.0 credit in:</b>		<b>1.0</b>
PSCI 6900 [0.5]	Ph.D. Field Examination I	
PSCI 6905 [0.5]	Ph.D. Field Examination II	
Field examinations normally take place once per year, in August. At the discretion of the Department, candidates may be required to take an oral examination following the written examination. Full-time students are normally required to complete the comprehensive examinations within 24 months of entering the program.		
<b>3. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>5. 0.5 credit in</b>	electives at the graduate level, in fields allied to major topics of the thesis. This credit will normally be fulfilled through regular course work rather than tutorials.	<b>0.5</b>
<b>6. 1.0 credit in:</b>		<b>1.0</b>
PSCI 6907 [0.5]	Thesis Proposal Workshop I	
PSCI 6908 [0.5]	Thesis Proposal Workshop II	
7. An oral defence of a written dissertation proposal. Full-time students must normally complete the oral defence of the proposal, preceded by its formal acceptance by the supervisory committee, in the third year of their doctoral program.		
<b>8. 0.0 credits in:</b>		<b>0.0</b>
PSCI 6909 [0.0]	Ph.D. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.5</b>

### Ph.D. Political Science with Collaborative Specialization in African Studies (Advanced Completion Option - 5.0 credits)

Applicants to the Ph.D. Political Science with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies may be considered for admission to an Advanced Completion Option of the Ph.D.

#### Requirements:

<b>1. 2.0 credits in</b>	courses at the 6000 level in each of the candidate's two major fields of study. A GPA of 9.0 or higher must be obtained in these courses for students to be allowed to proceed to the comprehensive examinations.	<b>2.0</b>
<b>2. 1.0 credit in:</b>		<b>1.0</b>
PSCI 6900 [0.5]	Ph.D. Field Examination I	
PSCI 6905 [0.5]	Ph.D. Field Examination II	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>4. 0.5 credit in</b>	electives at the graduate level, in fields allied to the major topics of the thesis. This credit will normally be fulfilled through regular course work rather than tutorials.	<b>0.5</b>
<b>5. 1.0 credit in:</b>		<b>1.0</b>
PSCI 6907 [0.5]	Thesis Proposal Workshop I	

PSCI 6908 [0.5] Thesis Proposal Workshop II

6. An oral defence of a written dissertation proposal. Full-time students must normally complete the oral defence of the proposal, preceded by its formal acceptance by the supervisory committee, in the third year of their doctoral program.

7. **0.0 credit in:**

PSCI 6909 [0.0] Ph.D. Thesis (in the specialization)

**Total Credits** **5.0**

### Ph.D. Sociology with Collaborative Specialization in African Studies (3.0 credits)

**Requirements - Standard Admission:**

1. **0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline:  
Historical and Current Perspectives

2. **0.0 credit in:** 0.0

AFRI 5800 [0.0] Scholarly Preparation in African  
Studies

3. **0.5 credit in:** 0.5

AFRI 6000 [0.5] Thinking from Africa: Historical  
Perspectives, Contemporary  
Dimensions

4. **0.0 credit in:** 0.0

SOCI 6101 [0.0] Introductory Doctoral Seminar

5. **1.0 credit in:** 1.0

SOCI 6102 [0.5] Doctoral Seminar Year 1:  
Comprehensive Exam

SOCI 6103 [0.5] Doctoral Seminar Year 2: Research  
Design

6. **0.5 credit in:** 0.5

SOCI 5008 [0.5] Teaching Sociology

OR one of the following:

SOCI 5000 [0.5] Classical Sociological Theory

SOCI 5001 [0.5] Special Topics in Classical Theory

SOCI 5002 [0.5] Contemporary Sociological Theory

SOCI 5003 [0.5] Special Topics in Contemporary  
Theory

SOCI 5006 [0.5] Thinking Sociologically

SOCI 5308 [0.5] Decolonizing Feminist Analyses

SOCI 5309 [0.5] Cultural Theory

SOCI 5400 [0.5] Political Sociology

SOCI 5401 [0.5] Critical Disability Studies

SOCI 5402 [0.5] Queer Migrations

SOCI 5404 [0.5] Race, Ethnicity and Class in  
Contemporary Societies

SOCI 5405 [0.5] Power and Stratification

SOCI 5407 [0.5] Genealogies of Politics and  
Governance

SOCI 5408 [0.5] Feminism and Materialism

SOCI 5501 [0.5] Phenomenology for Anthropologists  
and Sociologists

SOCI 5803 [0.5] Critical Theory

SOCI 5804 [0.5] Modern Marxist Theory

7. **0.5 credit in** SOCI courses at the 5000- or 6000-level or, with the permission of the graduate supervisor, up to 0.5 credit of graduate level course from another unit at Carleton 0.5

8. Written and oral comprehensive examination in one area of specialization

9. Presentation of a thesis proposal

10. **0.0 credit in:** 0.0

SOCI 6909 [0.0] Ph.D. Thesis (in the specialization)

11. An oral defence of the thesis

**Total Credits** **3.0**

### Ph.D. Sociology with Collaborative Specialization in African Studies (Advanced Completion Option - 2.5 credits)

Applicants to the Ph.D. Sociology with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies may be considered for admission to an advanced completion option of the Ph.D.

**Requirements - Advanced Completion Option:**

1. **0.5 credit in:** 0.5

AFRI 6000 [0.5] Thinking from Africa: Historical  
Perspectives, Contemporary  
Dimensions

2. **0.0 credit in:** 0.0

SOCI 6101 [0.0] Introductory Doctoral Seminar

3. **1.0 credit in:** 1.0

SOCI 6102 [0.5] Doctoral Seminar Year 1:  
Comprehensive Exam

SOCI 6103 [0.5] Doctoral Seminar Year 2: Research  
Design

4. **0.5 credit in:** 0.5

SOCI 5008 [0.5] Teaching Sociology

OR one of the following:

SOCI 5000 [0.5] Classical Sociological Theory

SOCI 5001 [0.5] Special Topics in Classical Theory

SOCI 5002 [0.5] Contemporary Sociological Theory

SOCI 5003 [0.5] Special Topics in Contemporary  
Theory

SOCI 5006 [0.5] Thinking Sociologically

SOCI 5308 [0.5] Decolonizing Feminist Analyses

SOCI 5309 [0.5] Cultural Theory

SOCI 5400 [0.5] Political Sociology

SOCI 5401 [0.5] Critical Disability Studies

SOCI 5402 [0.5] Queer Migrations

SOCI 5404 [0.5] Race, Ethnicity and Class in  
Contemporary Societies

SOCI 5405 [0.5] Power and Stratification

SOCI 5407 [0.5] Genealogies of Politics and  
Governance

SOCI 5408 [0.5] Feminism and Materialism

SOCI 5501 [0.5] Phenomenology for Anthropologists  
and Sociologists

SOCI 5803 [0.5] Critical Theory

SOCI 5804 [0.5] Modern Marxist Theory

5. **0.5 credit in** SOCI at the 5000- or 6000-level or, with the permission of the graduate supervisor, up to 0.5 credit of graduate level course from another unit at Carleton 0.5

6. Written and oral comprehensive examination in one area of specialization

7. Presentation of a thesis proposal

<b>8. 0.0 credit in:</b>	0.0
SOCI 6909 [0.0]      Ph.D. Thesis (in the specialization)	
9. An oral defence of the thesis	
<b>Total Credits</b>	<b>2.5</b>

### Selection of Courses - African Studies

The courses listed below are relevant to students of African Studies and could, with the approval of the specific requirements of the units involved, be used as courses to help fulfil degree requirements. There are also often graduate courses and 4000-level courses in a number of units at Carleton that are offered on an ad hoc basis that have significant content appropriate to African Studies. To have any such course count towards their degree requires approval of the Director of the Institute of African Studies when it is being offered.

### African Studies

AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
AFRI 5050 [0.5]	Selected Topics in African Studies
AFRI 5100 [0.5]	African Studies Abroad
AFRI 5700 [0.5]	Directed Readings in African Studies
AFRI 5900 [0.5]	Placement
AFRI 5800 [0.0]	Scholarly Preparation in African Studies

### Anthropology

ANTH 5109 [0.5]	Ethnography of Gender
ANTH 5209 [0.5]	Special Topics in Ethnography of Contemporary Africa
ANTH 5809 [0.5]	Special Topics in the Anthropology of Development

### English

ENGL 5008 [0.5]	Studies in African Literature
ENGL 5010 [0.5]	Studies in Caribbean Literature

### French

FREN 5212 [0.5]	Littératures francophones
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### International Affairs

INAF 5603 [0.5]	Issues in Development in Africa
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### Law

LAWS 5007 [0.5]	Race, Ethnicity and the Law
LAWS 5603 [0.5]	International Law: Theory and Practice

### Political Science

PSCI 5107 [0.5]	Globalization, Adjustment and Democracy in Africa
PSCI 5202 [0.5]	Development Theory and Issues
PSCI 5203 [0.5]	Southern Africa After Apartheid

### Sociology

SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies
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### Women's and Gender Studies

WGST 5902 [0.5]	Advanced Topics in Women's and Gender Studies II
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### Regulations

See the General Regulations section of this Calendar and the regulations of the participating unit.

### Admission

Admission to the collaborative program in African Studies is available to students who are admitted in one of the participating programs. To apply to one of the participating programs, please visit the Graduate Studies Admissions page.

### African Studies (AFRI) Courses

#### AFRI 5000 [0.5 credit]

#### African Studies as a Discipline: Historical and Current Perspectives

This course examines the formation of African Studies as a discipline, including the historical and ongoing debates over its boundaries and genealogies and its changing research paradigms.

#### AFRI 5050 [0.5 credit]

#### Selected Topics in African Studies

A course on a selected topic in African Studies. Topic varies from year to year and will be announced in advance of registration period.

Also offered at the undergraduate level, with different requirements, as AFRI 4050, for which additional credit is precluded.

#### AFRI 5060 [0.5 credit]

#### African Feminisms

African feminisms as theoretical interventions and as political practice, and as diverse forms. Gender as a marker of power: status, hierarchy, social capability, and as a system of distribution of resources, responsibilities and solidarities.

Also offered at the undergraduate level, with different requirements, as AFRI 4060, for which additional credit is precluded.

#### AFRI 5100 [0.5 credit]

#### African Studies Abroad

Based at one of Carleton's partner universities in Africa, course will include lectures, seminars, guest speakers, field visits and group research projects to examine a topic in African studies, as selected by the instructor. Topic and location may change annually.

Includes: Experiential Learning Activity

**AFRI 5700 [0.5 credit]****Directed Readings in African Studies**

A Tutorial on a selected topic in African Studies in which seminars are not available.

**AFRI 5800 [0.0 credit]****Scholarly Preparation in African Studies**

This course will provide scholarly preparation in African Studies by requiring participation in public talks as both audience member and presenter.

Includes: Experiential Learning Activity

**AFRI 5900 [0.5 credit]****Placement**

Students spend up to one day a week participating in an organization that has an African focus, while carrying out tasks that have a scholarly content. Consult the Director of the Institute of African Studies.

Includes: Experiential Learning Activity

**AFRI 6000 [0.5 credit]****Thinking from Africa: Historical Perspectives, Contemporary Dimensions**

Building upon the foundation provided in AFRI 5000, this course provides a multidisciplinary grounding in African thought and discourse from historical to contemporary perspectives.

Prerequisite(s): AFRI 5000 (may be taken concurrently).

## Anthropology

This section presents the requirements for programs in:

- **M.A. Anthropology**
- **M.A. Anthropology with Collaborative Specialization in Accessibility**
- **M.A. Anthropology with Collaborative Specialization in African Studies**
- **M.A. Anthropology with Collaborative Specialization in Climate Change**
- **M.A. Anthropology with Collaborative Specialization in Digital Humanities**
- **M. A. Anthropology with Collaborative Specialization in Latin American and Caribbean Studies**
- **Ph.D. Anthropology**
- **Ph.D. Anthropology with Collaborative Specialization in African Studies**
- **Ph.D. Anthropology with Collaborative Specialization in Political Economy**

**Program Requirements****M.A. Anthropology (5.0 credits)****Requirements - Thesis pathway (5.0 credits):**

<b>1. 0.5 credit in:</b>	0.5
ANTH 5401 [0.5] Theory in Anthropology (Normally to be taken in the first fall term after admission to the program)	
<b>2. 0.5 credit in:</b>	0.5
ANTH 5402 [0.5] Research in Anthropology	
<b>3. 2.0 credits in electives</b>	2.0
<b>4. 2.0 credits in:</b>	2.0
ANTH 5909 [2.0] M.A. Thesis	
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Research Essay pathway (5.0 credits):**

<b>1. 0.5 credit in:</b>	0.5
ANTH 5401 [0.5] Theory in Anthropology (Normally to be taken in the first fall term after admission to the program.)	
<b>2. 0.5 credit in:</b>	0.5
ANTH 5402 [0.5] Research in Anthropology	
<b>3. 3.0 credits in electives</b>	3.0
<b>4. 1.0 credit in:</b>	1.0
ANTH 5908 [1.0] M.A. Research Essay	
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Coursework pathway (5.0 credits):**

<b>1. 0.5 credit in:</b>	0.5
ANTH 5401 [0.5] Theory in Anthropology (Normally to be taken in the first fall term after admission to the program.)	
<b>2. 0.5 credit in:</b>	0.5
ANTH 5402 [0.5] Research in Anthropology	
<b>3. 4.0 credits in electives</b>	4.0
<b>Total Credits</b>	<b>5.0</b>

Electives may be chosen, in consultation with the student's adviser, from the following courses:

- anthropology graduate course offerings;
- sociology graduate courses (especially in theory and methods, or in areas which relate to the student's thesis research interests);
- 4000-level courses offered in the sociology and anthropology undergraduate program;
- or a combination of the above. (Normally no more than 1.0 credit may be chosen from course offerings in other departments.)

### **M.A. Anthropology with Collaborative Specialization in Accessibility (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits):**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5] Critical Disability Studies	
ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5401 [0.5] Theory in Anthropology	
ANTH 5402 [0.5] Research in Anthropology	
<b>3. 1.0 credit in ANTH at the graduate level (not including those listed above). With departmental permission 0.5 credit may be selected from courses at the 4000-level.</b>	<b>1.0</b>
<b>4. 2.0 credits in:</b>	<b>2.0</b>
ANTH 5909 [2.0] M.A. Thesis (in the specialization)	
5. An oral examination on the candidate's thesis and program	
<b>Total Credits</b>	<b>5.0</b>

#### **Requirements - Research essay pathway (5.0 credits):**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5] Critical Disability Studies	
ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5401 [0.5] Theory in Anthropology	
ANTH 5402 [0.5] Research in Anthropology	
<b>3. 2.0 credits in approved electives, chosen in consultation with the student's advisor</b>	<b>2.0</b>
<b>4. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5908 [1.0] M.A. Research Essay (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

#### **Requirements - Coursework pathway (5.0 credits):**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5] Critical Disability Studies	
ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5401 [0.5] Theory in Anthropology	
ANTH 5402 [0.5] Research in Anthropology	
<b>3. 0.5 credit in a course designated as having sufficient accessibility content and approved by the Anthropology graduate coordinator</b>	<b>0.5</b>

**3. 2.5 credits in approved electives, chosen in consultation with the student's advisor** 2.5

**Total Credits** 5.0

### **M.A. Anthropology with Collaborative Specialization in African Studies (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits):**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>	<b>0.0</b>
AFRI 5800 [0.0] Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5401 [0.5] Theory in Anthropology	
<b>4. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5402 [0.5] Research in Anthropology	
<b>5. 1.5 credits in electives (see Note, below)</b>	<b>1.5</b>
<b>6. 2.0 credits in:</b>	<b>2.0</b>
ANTH 5909 [2.0] M.A. Thesis	
<b>Total Credits</b>	<b>5.0</b>

#### **Requirements - Research Essay pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>	<b>0.0</b>
AFRI 5800 [0.0] Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5401 [0.5] Theory in Anthropology	
<b>4. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5402 [0.5] Research in Anthropology	
<b>5. 2.5 credits in electives (see Note, below)</b>	<b>2.5</b>
<b>6. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5908 [1.0] M.A. Research Essay	
<b>Total Credits</b>	<b>5.0</b>

#### **Requirements - Coursework pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>	<b>0.0</b>
AFRI 5800 [0.0] Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5401 [0.5] Theory in Anthropology	
(Normally to be taken in the first fall term after admission to the program.)	
<b>4. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5402 [0.5] Research in Anthropology	
<b>5. 0.5 credit from:</b>	<b>0.5</b>
ANTH 5109 [0.5] Ethnography of Gender	
ANTH 5209 [0.5] Special Topics in Ethnography of Contemporary Africa	
ANTH 5809 [0.5] Special Topics in the Anthropology of Development	

SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies	
- or an approved course in ANTH or SOCI approved by the Graduate Coordinator of the Institute of African Studies		
<b>6. 3.0 credits in</b>	electives, including 0.5 credit in a course designated as having sufficient African Studies content	3.0

<b>Total Credits</b>	<b>5.0</b>
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### M.A. Anthropology with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Thesis pathway:

1. 1.0 credit in:		1.0
CLIM 5000 [1.0]	Climate Collaboration	
2. 0.0 credit in:		
CLIM 5800 [0.0]	Climate Seminar Series	
3. 1.0 credit in:		1.0
ANTH 5401 [0.5]	Theory in Anthropology	
ANTH 5402 [0.5]	Research in Anthropology	
4. 1.0 credit in approved electives, chosen in consultation with the student's advisor		1.0
5. 2.0 credits in:		2.0
ANTH 5909 [2.0]	M.A. Thesis (in the specialization)	

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in:</b>		1.0
ANTH 5401 [0.5]	Theory in Anthropology	
ANTH 5402 [0.5]	Research in Anthropology	
<b>4. 2.0 credit in</b>	approved electives, chosen in consultation with the student's advisor	2.0
<b>5. 1.0 credit in:</b>		1.0
ANTH 5908 [1.0]	M.A. Research Essay (in the specialization)	

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Coursework pathway:

1. 1.0 credit in:		1.0
CLIM 5000 [1.0]	Climate Collaboration	
2. 0.0 credit in:		0.0
CLIM 5800 [0.0]	Climate Seminar Series	
3. 1.0 credit in:		1.0
ANTH 5401 [0.5]	Theory in Anthropology	
ANTH 5402 [0.5]	Research in Anthropology	
4. 0.5 credit in	a 5000-level ANTH course with sufficient climate change content, with departmental approval	0.5
5. 2.5 credits in	approved electives, chosen in consultation with the student's advisor	2.5

<b>Total Credits</b>	<b>5.0</b>
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### M.A. Anthropology with Collaborative Specialization in Digital Humanities (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

1. 0.5 credit in:	0.5
ANTH 5401 [0.5] Theory in Anthropology	
2. 0.5 credit in:	0.5
ANTH 5402 [0.5] Research in Anthropology	
3. 1.0 credit in electives	1.0
4. 2.0 credits in:	2.0
ANTH 5909 [2.0] M.A. Thesis (in the specialization)	
5. 0.5 credit in:	0.5
DIGH 5000 [0.5] Issues in the Digital Humanities	
6. 0.5 credit in DIGH (DIGH 5011, DIGH 5012, or annually-listed DIGH course)	0.5
7. 0.0 credit in:	0.0
DIGH 5800 [0.0] Digital Humanities: Professional Development	

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Research essay pathway:

<b>1. 0.5 credit in:</b>	0.5	
ANTH 5401 [0.5]	Theory in Anthropology (normally to be taken in the first fall term after admission to the program)	
<b>2. 0.5 credit in:</b>	0.5	
ANTH 5402 [0.5]	Research in Anthropology	
<b>3. 2.0 credits in</b>	electives	2.0
<b>4. 1.0 credit in:</b>	1.0	
ANTH 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>5. 0.5 credit in:</b>	0.5	
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>6. 0.5 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5
<b>7. 0.0 credit in</b>	DIGH 5800	0.0

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Coursework pathway (5.0 credits)

1. 0.5 credit in:	0.5
ANTH 5401 [0.5]	Theory in Anthropology (normally to be taken in the first fall term after admission to the program)
2. 0.5 credit in:	0.5
ANTH 5402 [0.5]	Research in Anthropology
3. 2.5 credits in electives	2.5
4. 0.5 credit in:	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities
5. 0.5 credit in DIGH (DIGH 5011, DIGH 5012, or annually-listed DIGH course)	0.5
6. 0.5 credit in 5000-level ANTH course with a digital humanities focus	0.5
7. 0.0 credit in:	0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development

<b>Total Credits</b>	<b>5.0</b>
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## M. A. Anthropology with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

### Requirements - Thesis pathway:

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.0 credit in:</b>	1.0
ANTH 5401 [0.5]	Theory in Anthropology
ANTH 5402 [0.5]	Research in Anthropology
<b>4. 1.5 credits in</b> electives	1.5
<b>5. 2.0 credits in:</b>	2.0
ANTH 5909 [2.0]	M.A. Thesis (on an approved topic with significant content related to Latin American and Caribbean Studies. )
<b>Total Credits</b>	<b>5.0</b>

### Requirements - Research essay pathway:

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.0 credit in:</b>	1.0
ANTH 5401 [0.5]	Theory in Anthropology
ANTH 5402 [0.5]	Research in Anthropology
<b>4. 2.5 credits in</b> electives	2.5
<b>5. 1.0 credit in:</b>	1.0
ANTH 5908 [1.0]	M.A. Research Essay (on an approved topic with significant content related to Latin American and Caribbean Studies)
<b>Total Credits</b>	<b>5.0</b>

### Requirements - Coursework pathway:

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.0 credit in:</b>	1.0
ANTH 5401 [0.5]	Theory in Anthropology
ANTH 5402 [0.5]	Research in Anthropology
<b>4. 0.5 credit from:</b>	0.5
ANTH 5109 [0.5]	Ethnography of Gender
ANTH 5208 [0.5]	Anthropology of Indigeneity
ANTH 5355 [0.5]	Anthropology of Natural Resources
ANTH 5560 [0.5]	Economic Anthropology
ANTH 5570 [0.5]	Political Anthropology
ANTH 5809 [0.5]	Special Topics in the Anthropology of Development

<b>5. 3.0 credits in</b> electives including 0.5 credit in course(s) designated as having sufficient Latin American and Caribbean Studies content, approved by both the Graduate Supervisor and the Coordinator of Latin American and Caribbean Studies.	3.0
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**Total Credits 5.0**

## Ph.D. Anthropology (3.0 credits)

### Requirements:

<b>1. 1.0 credit in:</b>	1.0
ANTH 6000 [1.0]	Doctoral Seminar: Theory and Method in Contemporary Anthropology
<b>2. 0.5 credit in:</b>	0.5
ANTH 6002 [0.5]	Research Design
Two terms satisfactory participation in:	0.0
ANTH 6100 [0.0]	Thesis Writing Seminar
<b>3. 1.5 credits in</b> SOCI or ANTH courses at the 5000- or 6000-level or, with the permission of the graduate supervisor, up to 1.0 credit of graduate level courses from another unit at Carleton	1.5
4. A satisfactory research preparation portfolio	
5. A satisfactory thesis proposal and (when required) Research Ethics Board clearance to undertake thesis research	
6. Satisfactory thesis research	
<b>7. 0.0 credit in:</b>	0.0
ANTH 6909 [0.0]	Ph.D. Thesis (including successful oral defence)
<b>Total Credits</b>	<b>3.0</b>

Residence requirements: Ph.D. candidates must normally be registered full-time in a minimum of six terms to satisfy the residence requirement. If a candidate is registered part-time the minimum residence requirement is eight terms.

## Ph.D. Anthropology with Collaborative Specialization in African Studies (3.0 credits)

### Requirements - Standard Admission:

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 0.5 credit in:</b>	0.5
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions
<b>4. 1.0 credit in:</b>	1.0
ANTH 6000 [1.0]	Doctoral Seminar: Theory and Method in Contemporary Anthropology
<b>5. 0.5 credit in:</b>	0.5
ANTH 6002 [0.5]	Research Design
<b>6. 0.0 credit in</b> (two terms satisfactory participation in):	
ANTH 6100 [0.0]	Thesis Writing Seminar
<b>7. 0.5 credit in</b> SOCI or ANTH courses at the 5000 or 6000 level	0.5

8. A satisfactory research preparation portfolio	
9. A satisfactory thesis proposal and (when required) Research Ethics Board clearance to undertake this research	
10. Satisfactory thesis research	
<b>11. 0.0 credit in:</b>	
ANTH 6909 [0.0] Ph.D. Thesis (in the specialization, including successful oral defence))	
<b>Total Credits</b>	<b>3.0</b>

### Ph.D. Anthropology with Collaborative Specialization in African Studies (Advanced Completion Option - 2.5 credits)

Applicants to the Ph.D. Anthropology with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies may be considered for admission to an advanced completion option of the Ph.D.

#### Requirements - Standard Admission:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
AFRI 6000 [0.5] Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ANTH 6000 [1.0] Doctoral Seminar: Theory and Method in Contemporary Anthropology	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
ANTH 6002 [0.5] Research Design	
<b>4. 0.0 credit in</b> (two terms satisfactory participation in):	
ANTH 6100 [0.0] Thesis Writing Seminar	
<b>5. 0.5 credit in</b> SOCI or ANTH courses at the 5000 or 6000 level	<b>0.5</b>
6. A satisfactory research preparation portfolio	
7. A satisfactory thesis proposal and (when required) Research Ethics Board clearance to undertake this research	
8. Satisfactory thesis research	
<b>9. 0.0 credit in:</b>	
ANTH 6909 [0.0] Ph.D. Thesis (in the specialization, including successful oral defence))	
<b>Total Credits</b>	<b>2.5</b>

### Ph.D. Anthropology with Collaborative Specialization in Political Economy (3.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
PECO 6000 [0.5] Political Economy: Core Concepts	
<b>2. 0.5 credit in</b> relevant political economy course from the approved list	<b>0.5</b>
<b>3. 1.0 credit in:</b>	<b>1.0</b>
ANTH 6000 [1.0] Doctoral Seminar: Theory and Method in Contemporary Anthropology	
<b>4. 0.5 credit in:</b>	<b>0.5</b>
ANTH 6002 [0.5] Research Design	
ANTH 6100 [0.0] Thesis Writing Seminar	

<b>5. 0.0 credit in</b> (two terms satisfactory participation in):	<b>0.0</b>
ANTH 6100 [0.0] Thesis Writing Seminar	
<b>3. 0.5 credits in</b> SOCI or ANTH courses at the 5000 or 6000 level.	<b>0.5</b>
4. A satisfactory research preparation portfolio	
5. A satisfactory thesis proposal and (when required) Research Ethics Board clearance to undertake thesis research	
6. Satisfactory thesis research	
<b>7. 0.0 credit in:</b>	<b>0.0</b>
ANTH 6909 [0.0] Ph.D. Thesis (in the specialization, including successful oral defence))	
<b>Total Credits</b>	<b>3.0</b>

### Regulations

See the General Regulations section of this Calendar.

#### Minimum Grade Requirement

A grade of B- or better is required in each credit counted toward the master's degree. With the recommendation of the department, and permission of the Vice Provost (Graduate Studies), a candidate may be allowed a grade of C+ in one 1.0 credit course or each of two 0.5 credit courses.

#### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the M.A. Anthropology is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

#### Transfer from One M.A. Option to Another M.A. Option

Students who choose to change from one program option to another (i.e., from/to the thesis, research essay, or course work option), are required to do so before registering for a third term after initial, full-time registration, or before registering for a fifth term after initial part-time registration.

### Regulations

See the General Regulations section of this Calendar.

Candidates must obtain a grade of B- or higher in each course and Satisfactory on the Ph.D. thesis and its oral defence.

### Admission

#### M.A. Anthropology

The requirement for admission into the master's program is a B.A. Honours (or the equivalent) with at least high honours standing in anthropology or a closely-related field. Where relevant, previous professional experience will be taken into account in determining an applicant's standing on admission.

#### Qualifying-Year Program

Applicants with a three-year non-honours bachelor's degree may be admitted into a qualifying-year program

designed to raise their standing to honours status. Students earning at least high honours standing in their qualifying-year courses will be considered for admission into the master's program. Refer to the General Regulations section of this Calendar for details of the regulations governing the qualifying year.

### **Accelerated Pathway**

The accelerated pathway in Anthropology is a flexible and individualized plan of graduate study for students in their final year of a Carleton B.A. Honours degree in Anthropology.

Students in their third or early#fourth year of study in the B.A. Honours degree in Anthropology should consult with the Graduate Coordinator to determine if the accelerated pathway is appropriate for them.

### **Accelerated Pathway Requirements**

1. ANTH courses at the 5000#level or higher with a grade of A- or higher, excluding ANTH 5900.
2. Minimum GPA in Anthropology of A-

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion for the M.A. degree. The final decision on whether or not advanced standing will be granted will be made at the time of admission. Students should indicate the desire to be considered for advanced standing in their application for admission to the M.A.

## **Admission**

### **Ph.D. Anthropology**

The Ph.D. Anthropology normally will be undertaken on a full-time basis, however the department will consider admission on a part-time basis. Full-time students are expected to complete the program in four years, and part-time students are expected to complete the program in eight years.

The normal requirement for admission to the Ph.D. program is a master's degree (or equivalent) in anthropology, normally with a minimum average of A-, and with no grade below B.

A student already enrolled in the Carleton M.A. program in Anthropology who shows outstanding academic performance and research promise may be permitted to transfer to the Ph.D. program upon completion of the M.A. course work and upon the recommendation of the Anthropology graduate committee.

Applicants whose academic preparation has deficiencies in certain areas may be admitted to the Ph.D. program, but will normally be required to complete additional course work.

Applicants whose first language is not English must demonstrate a fluent knowledge of English. Please see sections 3.6 in the General Regulations section of this calendar.

## **Anthropology (ANTH) Courses**

### **ANTH 5004 [0.5 credit]**

#### **Ecological Anthropology**

Theoretical and ethnographic approaches to the production of nature across disciplinary categories and natural-cultural configurations. Specific topics considered may include ecological crisis, indigenous rights and posthuman ethnography.

### **ANTH 5005 [0.5 credit]**

#### **Special Topics in Visual Anthropology**

Anthropological approaches to the study of visual cultures, visibility, and the role of visual media in ethnography. Topics may include film, photography, illustration, comics and graphic novels, animation, visual performance, multimodal approaches, digital modes and other visual media that challenge the primacy of textual representations.

Also offered at the undergraduate level, with different requirements, as ANTH 4550, for which additional credit is precluded.

### **ANTH 5100 [0.0 credit]**

#### **Thesis Writing Seminar**

This seminar will meet on a regular basis for students who are writing their master's theses to present draft chapters for constructive critical discussion. Graded Sat/Uns.

### **ANTH 5101 [0.5 credit]**

#### **Ethnographic Field Course**

In this class, we explore a significant issue in our communities, learning how ethnographic methods can add new perspectives to our own experience and help us appreciate the experience of others. Students learn-through-doing their own small ethnographic projects, peer-to-peer feedback, and reflective discussion.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as ANTH 4100, for which additional credit is precluded.

### **ANTH 5109 [0.5 credit]**

#### **Ethnography of Gender**

Ethnographic focus on topics may include: global political-economy, colonialism and post-colonialism, racialization and racism, work and labour, expressive and music cultures, as well as social movements as they intersect with gender and sexualities. Topics and approaches may vary from year to year.

Also offered at the undergraduate level, with different requirements, as ANTH 4109, for which additional credit is precluded.

**ANTH 5205 [0.5 credit]****Language, Place and the North**

An investigation of language, places, spaces, and environment, focussing on Indigenous peoples and the Arctic and subarctic regions of Canada. Topics include critical understandings of language use, northern environments, Indigenous homelands, and the role of Indigenous languages in defining and transforming cultural and geographic space.

Also offered at the undergraduate level, with different requirements, as ANTH 4205, for which additional credit is precluded.

**ANTH 5208 [0.5 credit]****Anthropology of Indigeneity**

For the purposes of this course, Indigenous cultures are cultures that have been transformed through the struggles of colonized peoples to resist and redirect projects of settler nationhood. This course looks at those transformations and resistance in a variety of social, political and economic contexts.

Also offered at the undergraduate level, with different requirements, as ANTH 4610, for which additional credit is precluded.

**ANTH 5209 [0.5 credit]****Special Topics in Ethnography of Contemporary Africa**

Research-based seminar that explores the debates related to ethnographic research in (a) selected region(s) of Africa. Topics may include social movements, expressive cultures, religious practices, conflict, identity politics, political economy, colonialism and postcolonialism, migration and diaspora, health, race, gender, and climate change.

Also offered at the undergraduate level, with different requirements, as ANTH 4620, for which additional credit is precluded.

**ANTH 5355 [0.5 credit]****Anthropology of Natural Resources**

Anthropology of natural resources. Topics may include the economies, ecologies, cultural and social dynamics of fishing, forestry, lands, mining, oil, wildlife, at varying analytical scales, including a critical examination of the term "natural resource" itself.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as ANTH 4355, for which additional credit is precluded.

**ANTH 5401 [0.5 credit]****Theory in Anthropology**

Introduction to the practice of theory in anthropology. Discussion of how anthropologists have engaged and formulated theoretical discussions and developed conceptual frameworks in relation to longstanding theoretical concerns, ethnographic practice, and the problems they care about, including calls to decolonize anthropology.

Prerequisite(s): enrolment in the MA program in Anthropology or permission of the Department.

**ANTH 5402 [0.5 credit]****Research in Anthropology**

Issues in the design and methods of anthropological inquiry, including how to conceptualize and shape a project, the relationship between theories and methods, the process of writing a proposal, and creative, responsible, and decolonial approaches to research.

Prerequisite(s): ANTH 5401 or permission of the Department.

**ANTH 5403 [0.5 credit]****Symbolic and Semiotic Anthropology**

The role of signs and symbols in social life, including the properties of signs, the workings of symbolic systems, the construction of social reality, and the role all these play in actors' practice.

Also offered at the undergraduate level, with different requirements, as ANTH 4403, for which additional credit is precluded.

**ANTH 5501 [0.5 credit]****Phenomenology for Anthropologists and Sociologists**

This seminar builds theoretical and methodological bridges between phenomenology and anthropology/sociology. Students read key texts from, among others, Husserl, Heidegger, Merleau-Ponty, Plessner, Schultz, and Waldenfels and learn to apply concepts in research. Topics include body and senses, intersubjectivity and life-world, selfhood and otherness.

Also listed as SOCI 5501.  
seminar

**ANTH 5505 [0.5 credit]****Anthropology of Performance**

The seminar introduces students to the anthropological concept of performance and its foundations in speech act theory, practice theory, semiotics and phenomenology. Topics range from the cross-cultural study of diverse performance genres to reflections on the performative nature of social life and cultural reality.

**ANTH 5560 [0.5 credit]****Economic Anthropology**

Anthropology's holistic, comparative and critical contribution to the study of livelihood. How practices and understandings of production, circulation, consumption, and property vary cross-culturally. Relevant theoretical debates including those among formalist (neo-classical), substantivist, Marxist, and interpretive approaches over the applicability of capitalist thinking.

Also offered at the undergraduate level, with different requirements, as ANTH 4560, for which additional credit is precluded.

Seminar three hours a week.

**ANTH 5570 [0.5 credit]****Political Anthropology**

Can anthropology help us understand politics? Can ethnographic encounters help us approach political theory and political action differently? This seminar will focus on concepts (power, authority, equality) and practices (resistance, subjection, solidarity) through which anthropologists invite us to rethink the way we live together.

Also offered at the undergraduate level, with different requirements, as ANTH 4570, for which additional credit is precluded.

**ANTH 5701 [0.5 credit]****Anthropology of Religion**

Anthropological literature and theories on religion in light of current debates in anthropology.

**ANTH 5704 [0.5 credit]****Anthropology of the Body, Health, Illness and Healing**

Issues and applications in medical anthropology. How the body, health, and illness are understood and managed in the context of culture, social relations and inequalities, structural violence, political-economic forces, and global relations.

**ANTH 5706 [0.5 credit]****Contemporary Material Cultures**

The study of material culture and its potential for addressing contemporary social and cultural conditions in a variety of local and transcultural contexts.

**ANTH 5708 [0.5 credit]****Special Topics in Anthropology**

Topic varies from year to year, and will be announced in advance of the registration period.

**ANTH 5808 [0.5 credit]****Special Topics in North American Ethnography**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

**ANTH 5809 [0.5 credit]****Special Topics in the Anthropology of Development**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

Also offered at the undergraduate level, with different requirements, as ANTH 4809, for which additional credit is precluded.

**ANTH 5900 [0.5 credit]****Tutorial**

A tutorial is designed to permit students to pursue individual research on a relevant topic. Topics will be chosen in consultation with at least one faculty member, the student's supervisor, and the Anthropology graduate coordinator.

**ANTH 5907 [0.5 credit]****Placement in Anthropology**

This course provides master's students with the opportunity to apply academic skills and knowledge while working within an organization in the community, in an area relevant to anthropology.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**ANTH 5908 [1.0 credit]****M.A. Research Essay**

Students will normally enrol in this course for a maximum of three consecutive terms of study, including one summer term. Students must normally enrol in this course not later than the beginning of the second full year of study.

Includes: Experiential Learning Activity

**ANTH 5909 [2.0 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

**ANTH 6000 [1.0 credit]****Doctoral Seminar: Theory and Method in Contemporary Anthropology**

An in-depth exploration of theory and method in contemporary socio-cultural anthropology with special emphasis on engaged anthropology and calls to decolonize the discipline. This course is required of all first year doctoral students in anthropology.

**ANTH 6002 [0.5 credit]****Research Design**

Issues in the design and methods of anthropological inquiry, including questions of positionality, proposal-writing, research ethics, and research funding. Required of all first-year Ph.D. Anthropology students.

Includes: Experiential Learning Activity

**ANTH 6100 [0.0 credit]****Thesis Writing Seminar**

This seminar will meet on a regular basis for students who are writing their doctoral theses to present draft chapters for constructive critical discussion. Normally required for all Ph.D. Anthropology students who have completed their doctoral research, until the completion of their theses.

**ANTH 6900 [0.5 credit]****Tutorial**

A tutorial is designed to permit students to pursue individual research on a relevant topic. Topics will be chosen in consultation with at least one faculty member, the student's supervisor, and the Anthropology graduate coordinator.

**ANTH 6907 [0.5 credit]****Placement in Anthropology**

This course provides doctoral students with the opportunity to apply academic skills and knowledge while working within an organization in the community, in an area relevant to anthropology.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**ANTH 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Applied Linguistics and Discourse Studies

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This section presents the requirements for programs in:

- **M.A. Applied Linguistics and Discourse Studies**
- **M.A. Applied Linguistics and Discourse Studies with Collaborative Specialization in African Studies**
- **M.A. Applied Linguistics with Collaborative Specialization in Digital Humanities**
- **Ph.D. Applied Linguistics and Discourse Studies**

**Program Requirements****M.A. Applied Linguistics and Discourse Studies (5.0 credits)**

Students will establish their programs in consultation with the School's supervisor of graduate studies. Each candidate will select one of the following program paths:

**Requirements - Thesis pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ALDS 5001 [0.5]	Directions in Applied Linguistics and Discourse Studies
ALDS 5002 [0.5]	Inquiry Strategies in Applied Linguistics and Discourse Studies
<b>2. 1.0 credit in ALDS at the 5000 level</b>	<b>1.0</b>
<b>3. 1.0 credit in ALDS or LING at the 5000 level</b>	<b>1.0</b>
<b>4. 2.0 credits in:</b>	<b>2.0</b>
ALDS 5909 [2.0]	M.A. Thesis
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Research Essay pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ALDS 5001 [0.5]	Directions in Applied Linguistics and Discourse Studies
ALDS 5002 [0.5]	Inquiry Strategies in Applied Linguistics and Discourse Studies
<b>2. 2.0 credits in ALDS at the 5000 level</b>	<b>2.0</b>
<b>3. 1.0 credit in ALDS or LING at the 5000 level</b>	<b>1.0</b>
<b>4. 1.0 credit in:</b>	<b>1.0</b>
ALDS 5908 [1.0]	Research Essay
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Coursework pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
ALDS 5001 [0.5]	Directions in Applied Linguistics and Discourse Studies
ALDS 5002 [0.5]	Inquiry Strategies in Applied Linguistics and Discourse Studies
<b>2. 3.0 credits in ALDS at the 5000 level</b>	<b>3.0</b>
<b>3. 1.0 credit in ALDS or LING at the 5000 level</b>	<b>1.0</b>
<b>Total Credits</b>	<b>5.0</b>

The choice of thesis, research essay, or credit program path will be made by the student, with the advice of the Supervisor. Relevant factors will include the student's academic goals, professional goals, and background knowledge.

ALDS 5001 is normally to be taken in the first fall term after admission to the program.

Permission may be granted for enrollment in 1.0 credit offered in another department.

Graduate students may take courses at the senior undergraduate (4th year) level up to a maximum of 1.0 credit. Permission of the School's graduate supervisor is required. Students may take a combination of senior undergraduate courses and 'piggybacked' courses (fourth-year courses also offered, with different requirements, at the graduate level) up to a maximum of 1.5 credits.

It is expected that students will progress steadily towards the completion of requirements for the degree. In particular, it is normally expected that:

- a full-time student will complete 3.0 credits of course work within two terms of study, and an acceptable thesis proposal early in the third term of study; or 4.0 credits of course work within three terms, and an acceptable research essay proposal early in the fourth term; and all degree requirements within six terms of study.
- a part-time student will complete 3.0 credits of course work within three years of initial registration, and an acceptable thesis proposal early in the fourth year; or 4.0 credits of course work within four years, and an acceptable research essay proposal early in the fifth year; and all degree requirements within six years of initial registration.
- a student who registers in a combination of full-time and part-time study will, in consultation with an adviser, develop a schedule for completion of course requirements and a thesis or research essay proposal, consistent with times to completion stated above and with the overall time limits specified in the General Regulations section in this Calendar.

### **M.A. Applied Linguistics and Discourse Studies with Collaborative Specialization in African Studies (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		1.0
ALDS 5001 [0.5]	Directions in Applied Linguistics and Discourse Studies	
ALDS 5002 [0.5]	Inquiry Strategies in Applied Linguistics and Discourse Studies	
<b>4. 1.5 credits from</b>	any 5000-level ALDS course (in consultation with their advisor, students may take up to 1.0 credit in graduate courses from other programs at Carleton University or the University of Ottawa; up to 1.0 credit can be taken at the 4000 level; up to 1.5 credits can be taken in piggybacked courses)	1.5
<b>5. 2.0 credits in:</b>		2.0
ALDS 5909 [2.0]	M.A. Thesis	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research Essay pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		1.0
ALDS 5001 [0.5]	Directions in Applied Linguistics and Discourse Studies	
ALDS 5002 [0.5]	Inquiry Strategies in Applied Linguistics and Discourse Studies	
<b>4. 2.5 credits from</b>	any 5000-level ALDS course (in consultation with their advisor, students may take up to 1.0 credit in graduate courses from other programs at Carleton University or the University of Ottawa; up to 1.0 credit can be taken at the 4000 level; up to 1.5 credits can be taken in piggybacked courses)	2.5
<b>5. 1.0 credit in:</b>		1.0
ALDS 5908 [1.0]	Research Essay	
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Applied Linguistics with Collaborative Specialization in Digital Humanities (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>		1.0
ALDS 5001 [0.5]	Directions in Applied Linguistics and Discourse Studies	
ALDS 5002 [0.5]	Inquiry Strategies in Applied Linguistics and Discourse Studies	
<b>2. 0.5 credit in:</b>		0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>3. 0.5 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5
<b>4. 0.0 credit in:</b>		0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>5. 1.0 credit from</b>	any 5000-level ALDS course	1.0
<b>6. 2.0 credits in:</b>		2.0
ALDS 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research Essay pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>		1.0
ALDS 5001 [0.5]	Directions in Applied Linguistics and Discourse Studies	
ALDS 5002 [0.5]	Inquiry Strategies in Applied Linguistics and Discourse Studies	
<b>2. 0.5 credit in:</b>		0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>3. 0.5 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5
<b>4. 0.0 credit in:</b>		0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>5. 2.0 credits from</b>	any 5000-level ALDS course	2.0
<b>6. 1.0 credit in:</b>		1.0
ALDS 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

**Requirements - Coursework pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>	1.0
ALDS 5001 [0.5]	Directions in Applied Linguistics and Discourse Studies
ALDS 5002 [0.5]	Inquiry Strategies in Applied Linguistics and Discourse Studies
<b>2. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>3. 0.5 credit in DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)</b>	0.5
<b>4. 0.5 credit in 5000-level ALDS with Digital Humanities focus or a DIGH course, chosen in consultation with the SLALS graduate supervisor</b>	0.5
<b>5. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>6. 2.5 credits from any 5000-level ALDS course</b>	2.5
<b>Total Credits</b>	<b>5.0</b>

**Ph.D. Applied Linguistics and Discourse Studies (4.5 credits)****Requirements (4.5 credits):**

<b>1. 1.0 credit in:</b>	1.0
ALDS 6101 [0.5]	Doctoral Core Seminar in Applied Linguistics and Discourse Studies, Part I
ALDS 6102 [0.5]	Doctoral Core Seminar in Applied Linguistics and Discourse Studies, Part II
<b>2. 1.0 credit in elective courses</b>	1.0
<b>3. 1.0 credit in:</b>	1.0
ALDS 6200 [1.0]	Praxis in Applied Linguistics and Discourse Studies
or	
ALDS 6211 [0.5]	Praxis in Applied Linguistics and Discourse Studies I
& ALDS 6212 [0.5]	Praxis in Applied Linguistics and Discourse Studies II
<b>4. 0.5 credit in:</b>	0.5
ALDS 6109 [0.5]	Doctoral Project I: Literature Review
<b>5. 0.5 credit in:</b>	0.5
ALDS 6209 [0.5]	Doctoral Project II: Thesis Proposal
<b>6. 0.5 credit in:</b>	0.5
ALDS 6309 [0.5]	Doctoral Project III: Research Progress Report
<b>7. 0.0 credit in:</b>	0.0
ALDS 6909 [0.0]	Ph.D. Thesis
<b>Total Credits</b>	<b>4.5</b>

**Regulations**

See the General Regulations section of this Calendar.

A standing of B- or better must be obtained in each credit counted towards the master's degree.

**Regularly Scheduled Break**

For immigration purposes, the summer term (May to August) for the M.A. Applied Linguistics and Discourse Studies including all specializations/concentrations is considered a regularly scheduled break approved by the

University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

**Regulations**

See the General Regulations section of this Calendar, and in addition the following:

- Candidates must maintain a grade point average of 10.0 or better throughout this program.

**Residence Requirement**

Ph.D. candidates must normally be registered full-time in a minimum of six terms to satisfy the residence requirement. If a candidate is registered part-time, the minimum residence requirement is eight terms.

**Guidelines for Completion of Ph.D.**

Full-time Ph.D. students are normally expected to complete their requirements in four calendar years. All part-time students must complete their requirements within a period of nine years, as set out in the General Regulations in the Graduate Calendar.

**Admission**

The normal minimum requirement for admission to the master's program is a B.A. Honours degree in a discipline involving the analysis of language or the study of language use or learning; or a 3 year B.A. in a relevant discipline together with a B.Ed. or C.T.E.S.L.

Students must have achieved a minimum of B+ in related courses and B overall in their academic work.

Relevant professional experience may also enhance a candidate's application.

For other admission regulations not specific to the School of Linguistics and Language Studies, refer to the General Regulations section of the Graduate Calendar, in particular the subsection on Admission Requirements and Eligibility.

**Accelerated Pathway**

The accelerated pathway in the School of Linguistics and Language Studies is a flexible and individualized plan of graduate study for students in their final year of a Carleton B.A. Honours degree, or equivalent, may qualify for this option.

Students in their third-year of study in the B.A. Honours degree in Applied Linguistics and Discourse Studies should consult with both the Undergraduate Advisor and the Graduate Advisor to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

**Accelerated Pathway Requirements**

1. Two ALDS courses at the 5000 level (excluding ALDS 5001 and ALDS 5002).
2. Minimal overall CGPA of B+

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### **Admission**

The normal requirement for admission to the Ph.D. program is a Master's Degree in Applied Language Studies, Applied Linguistics, Teaching English as a Second Language, Composition and Rhetoric, or an acceptable equivalent field, with at least an A- average (10 G.P.A.).

Applicants whose academic preparation has deficiencies in certain areas may be admitted to the Ph.D. program with the requirement that they take additional courses.

In addition to transcripts and letters of reference, applications will include a statement of interest outlining the applicant's proposed area of doctoral research and a representative sample of the applicant's academic writing.

### **Applied Linguistics and Discourse Studies (ALDS) Courses**

#### **ALDS 5001 [0.5 credit]**

##### **Directions in Applied Linguistics and Discourse Studies**

A survey of current research directions in Applied Linguistics and Discourse Studies and an introduction to ongoing research in the School. The course introduces students to the scope of theory and practice in the field.

#### **ALDS 5002 [0.5 credit]**

##### **Inquiry Strategies in Applied Linguistics and Discourse Studies**

A consideration of various approaches to the design of studies and the collection and analysis of data. Naturalistic and quasi-experimental methods will be discussed. The role of statistics in disciplined inquiry, including an introduction to elementary procedures.

#### **ALDS 5005 [0.5 credit]**

##### **Theoretical Foundations for Applied Linguistics and Discourse Studies**

Overview of the works of 20th and 21st-century theorists such as Bakhtin, Bourdieu, Burke, Foucault, Latour and Vygotsky.

#### **ALDS 5102 [0.5 credit]**

##### **Systemic-Functional Linguistics**

Functions of language in the exchange of meanings between people in a wide variety of communicative situations. Semantic and syntactic resources at risk in these different contexts. Interactions between language and the social context.

Prerequisite(s): restricted to graduate students in Applied Linguistics and Discourse Studies and Journalism and Communication.

Also offered at the undergraduate level, with different requirements, as ALDS 4709, for which additional credit is precluded.

#### **ALDS 5202 [0.5 credit]**

##### **Curriculum in Language Teaching**

Current theory and practice in language curriculum development and evaluation in the light of recent research in linguistics, sociolinguistics, language acquisition and language education policy.

Includes: Experiential Learning Activity

#### **ALDS 5203 [0.5 credit]**

##### **Issues in English Language Teaching/Teacher Education**

A research seminar to explore current issues in English language teaching/teacher education.

#### **ALDS 5204 [0.5 credit]**

##### **Seminar in University Teaching**

Theoretical and empirical work related to teaching in higher education. Analysis of instructional discourse, use of language in classroom decision-making, bases of effective practice and methods of instruction. Constructivist principles of teaching and learning. Role of teaching in university scholarship.

Also listed as PSYC 6104.

#### **ALDS 5207 [0.5 credit]**

##### **Pedagogical Grammar in Second and Foreign Language (SL/FL) Teaching**

The concept of pedagogical grammar in SL/FL teaching. Critical examination of recent theories of 'focus on form' in communicative language classrooms, and related empirical work.

Includes: Experiential Learning Activity

**ALDS 5208 [0.5 credit]****Languages for Specific Purposes (LSP)**

Introduction to LSP, a sub-field of applied linguistics tailoring language instruction to specific groups of learners. Developments in strands of LSP (English for Science, Business, etc.). Research and teaching methodology. Emphasis on English for Academic Purposes/English for Specific Purposes research and instruction at Carleton.

Also offered at the undergraduate level, with different requirements, as ALDS 4208, for which additional credit is precluded.

**ALDS 5215 [1.0 credit]****Methodology and Practicum in Teaching English as a Second Language**

Classification of classroom teaching methods and materials; creation and adaptation of teaching materials for particular situations; teaching techniques and strategies. The required practicum portion of the course integrates academics with practical work. Observation in ESL classes and possible assistance with teaching materials or classes.

Includes: Experiential Learning Activity

Precludes additional credit for ALDS 5205 (no longer offered), ALDS 5806 (no longer offered).

**ALDS 5301 [0.5 credit]****Language and Cognition**

An introduction to the contribution of theoretical linguistics and linguistic research to cognitive science.

Includes: Experiential Learning Activity

Also listed as CGSC 5003 and LING 5608.

**ALDS 5302 [0.5 credit]****Second Language Acquisition and Learning Theories**

Current social and cognitive theories of knowledge and learning and their application to the acquisition of first and additional languages; relation of theory to empirical studies of language learning in classroom and natural settings.

Includes: Experiential Learning Activity

**ALDS 5303 [0.5 credit]****Linguistic Analysis, Culture and Cognition**

Universals of language from a cross-cultural perspective. Study of lesser-known languages leading to critical understanding of universal human concepts and communication practices in culture-specific configurations. Cross-linguistic analysis as a means to general understanding of diversity and universality in human cognition.

Includes: Experiential Learning Activity

**ALDS 5407 [0.5 credit]****Language Policy and Planning**

Interaction of political, social, and cultural factors in the planning and implementation of language policy in international contexts.

Prerequisite(s): fourth-year courses in linguistics or permission of the School.

**ALDS 5408 [0.5 credit]****Critical Discourse Analysis**

Discourse in the structuring of social and cultural change and in a wide range of contexts such as the media and education.

Includes: Experiential Learning Activity

**ALDS 5501 [0.5 credit]****Language Assessment Theory and Practice**

Issues in language testing and classroom assessment, including validity theory and current validation research; challenges in test development; washback; models of alternative assessment.

Includes: Experiential Learning Activity

**ALDS 5604 [0.5 credit]****Statistics for Language Research**

Application of statistical procedures to analysis of language data and to problems of measurement in experimental linguistics, applied linguistics, psycholinguistics, and related fields.

Includes: Experiential Learning Activity

Also listed as LING 5606.

Also offered at the undergraduate level, with different requirements, as ALDS 4606 and LING 4606., for which additional credit is precluded.

**ALDS 5605 [0.5 credit]****Research and Theory in Workplace Writing**

Developments in the study of workplace writing from the 1970s, with a focus on recent work. Discussion of how writing is used in accomplishing work, what constitutes proficiency in workplace writing, and how novices learn to write in the workplace.

Includes: Experiential Learning Activity

**ALDS 5607 [0.5 credit]****Research and Theory in Academic Writing**

Major developments in the study of academic writing from the 1970s, with a focus on recent work. Discussion of what academic writing entails, what constitutes proficiency in academic writing, and how instruction can help students develop their writing abilities.

Includes: Experiential Learning Activity

**ALDS 5703 [0.5 credit]****Approaches to Genre Studies**

Major developments in the study of non-literary genres from the 1980s, with a focus on recent work. Consideration of genre as text-based social action. Discussion of genre as a central concept and tool of analysis in Writing Studies and Discourse Studies. Includes: Experiential Learning Activity

**ALDS 5705 [0.5 credit]****Second Language Writing: Research and Theory**

Second language writing: research, theory, and pedagogy.

**ALDS 5801 [0.5 credit]****Linguistic Field Methods**

With a language consultant, students discover the phonological, morphological, and syntactic structures of the target language using linguistic elicitation. Language will vary from year to year, but will normally be a non-European language. Language documentation, data management, ethical issues surrounding research in indigenous communities.

Includes: Experiential Learning Activity

Also listed as LING 5801.

Also offered at the undergraduate level, with different requirements, as LING 4801, for which additional credit is precluded.

**ALDS 5902 [0.5 credit]****Tutorial in Applied Linguistics and Discourse Studies**

A one-term tutorial to study applications of linguistics in such areas as first-language education and second-language teaching.

**ALDS 5903 [0.5 credit]****Special Topics in the Teaching and Acquisition of Additional Languages**

Exploration of topics from current research into the teaching and acquisition of additional languages. Topic to be announced.

**ALDS 5904 [0.5 credit]****Special Topics in Written Discourse/Literacies**

Exploration of topics from current research into the nature, acquisition and teaching of written discourse/literacies. Topic to be announced.

**ALDS 5905 [0.5 credit]****Special Topics in Applied Linguistics and Discourse Studies**

Exploration of a topic from current research in Applied Linguistics and Discourse Studies. Topic to be announced.

**ALDS 5907 [1.0 credit]****Tutorial in Applied Linguistics and Discourse Studies**

A two-term tutorial to study applications of linguistics in such areas as first-language education and second-language teaching.

**ALDS 5908 [1.0 credit]****Research Essay**

Includes: Experiential Learning Activity

**ALDS 5909 [2.0 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

**ALDS 6101 [0.5 credit]****Doctoral Core Seminar in Applied Linguistics and Discourse Studies, Part I**

Detailed examination of foundational texts, current theories, and research methodologies in Applied Linguistics and Discourse Studies.

Includes: Experiential Learning Activity

**ALDS 6102 [0.5 credit]****Doctoral Core Seminar in Applied Linguistics and Discourse Studies, Part II**

Detailed examination of foundational texts, current theories, and research methodologies in Applied Linguistics and Discourse Studies.

Includes: Experiential Learning Activity

Prerequisite(s): ALDS 6101.

**ALDS 6105 [0.5 credit]****Directed Readings in Applied Linguistics and Discourse Studies**

Research on a topic chosen in consultation with a faculty member and with the approval of the graduate supervisor.

**ALDS 6109 [0.5 credit]****Doctoral Project I: Literature Review**

The production, oral presentation and written submission of a synthesis of a prescribed body of theory and research underlying the fields of Applied Linguistics and Discourse Studies.

Prerequisite(s): ALDS 6102.

**ALDS 6200 [1.0 credit]****Praxis in Applied Linguistics and Discourse Studies**

Field placement in an educational, workplace or community setting with guided reflective, theory-informed analysis of the field experience.

Includes: Experiential Learning Activity

Precludes additional credit for ALDS 6211, ALDS 6212.

**ALDS 6209 [0.5 credit]****Doctoral Project II: Thesis Proposal**

The production, public presentation, written submission, and defence of a proposal for the student's thesis research.

**ALDS 6211 [0.5 credit]****Praxis in Applied Linguistics and Discourse Studies I**

Field placement in an educational, workplace or community setting with guided reflective, theory-informed analysis of the field experience.

Includes: Experiential Learning Activity

Precludes additional credit for ALDS 6200.

**ALDS 6212 [0.5 credit]****Praxis in Applied Linguistics and Discourse Studies II**

Field placement in an educational, workplace or community setting with guided reflective, theory-informed analysis of the field experience.

Includes: Experiential Learning Activity

Precludes additional credit for ALDS 6200.

**ALDS 6309 [0.5 credit]****Doctoral Project III: Research Progress Report**

A written progress report on the student's thesis research, which, in consultation with the thesis supervisor, can consist of a research article prepared for publication, a conference-based paper, or another format deemed of relevance to the student's doctoral research.

**ALDS 6407 [0.5 credit]****Revitalization Policy**

The core PhD seminar in Revitalization Policy. Topics include the detailed examination of foundational texts, current theories, research methodologies, and best practices in language revitalization. Includes significant focus on interactions with language communities, field methods, and related ethics.

**ALDS 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Architecture

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This section presents the requirements for programs in:

- **M. Architectural Studies**
- **M. Architecture 2-year Stream**
- **M. Architecture 3-year Stream**
- **M. Architecture 2-year stream with Collaborative Specialization in Accessibility**
- **M. Architecture 3-year stream with Collaborative Specialization in Accessibility**
- **M. Architecture 2-year stream with Collaborative Specialization in Climate Change**
- **M. Architecture 3-year stream with Collaborative Specialization in Climate Change**
- **Ph.D. Architecture**
- **Ph.D. Architecture with Collaborative Specialization in African Studies**
- **Graduate Diploma in Architectural Conservation**

**Program Requirements****M. Architectural Studies (6.0 credits)**

Note: Please consult the School regarding registration sequence.

**Requirements:**

<b>1. 2.5 credits in core courses:</b>		<b>2.5</b>
ARCH 5003 [0.5]	Design and Culture Workshop	
ARCH 5103 [0.5]	Colloquium I: Architectural Research Methods	
ARCH 5104 [0.5]	Colloquium II: Architectural Research Presentation	
ARCH 5301 [0.5]	Texts, Precedents and Writings in Architecture I	
ARCN 5301 [0.5]	Workshop: Design as Research I	
<b>2. 1.5 credits in elective courses at the 5000-level or above.</b>		<b>1.5</b>
<b>3. 2.0 credits in:</b>		<b>2.0</b>
ARCT 5909 [2.0]	M.A.S. Thesis	
<b>Total Credits</b>		<b>6.0</b>

**M. Architecture 2-year Stream (8.0 credits)**

Note: Please consult the School regarding registration sequence.

**Requirements:**

<b>1. 2.5 credits in core:</b>		<b>2.5</b>
ARCH 5224 [0.5]	Advanced Building Systems	
ARCH 5333 [0.5]	Selected Topics in Architectural Theory	
ARCH 5444 [0.5]	Comprehensive Studio Workshop	
ARCH 5551 [0.5]	Professional Practice	
ARCH 5552 [0.5]	Design Thesis Preparation	
<b>2. 2.0 credits in studio:</b>		<b>2.0</b>
ARCH 5114 [1.0]	Comprehensive Studio: Climate + Integration	
ARCH 5115 [1.0]	Graduate Studio Abroad: Agency + Justice	
<b>3. 2.0 credits in:</b>		<b>2.0</b>
ARCH 5555 [2.0]	Architecture Thesis	

**4. 1.5 credits in free electives at the 4000-level or higher** **1.5**

**Total Credits** **8.0**

### M. Architecture 3-year Stream (15.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

**1. 6.0 credits in core:** **6.0**

ARCH 5221 [0.5] Ecological & Regulatory Systems

ARCH 5222 [0.5] Structures

ARCH 5223 [1.0] Assemblies and Environmental Systems

ARCH 5224 [0.5] Advanced Building Systems

ARCH 5331 [0.5] Modernism and Global Urbanism

ARCH 5332 [0.5] Contemporary Theories in Architecture

ARCH 5333 [0.5] Selected Topics in Architectural Theory

ARCH 5441 [0.5] Studio 1: Workshop

ARCH 5444 [0.5] Comprehensive Studio Workshop

ARCH 5551 [0.5] Professional Practice

ARCH 5552 [0.5] Design Thesis Preparation

**2. 5.0 credits in studio:** **5.0**

ARCH 5111 [1.0] Studio I: Land & Environment

ARCH 5112 [1.0] Studio II: Materiality + Adaptation

ARCH 5113 [1.0] Studio III: Urbanism + Society

ARCH 5114 [1.0] Comprehensive Studio: Climate + Integration

ARCH 5115 [1.0] Graduate Studio Abroad: Agency + Justice

**3. 2.0 credits in:** **2.0**

ARCH 5555 [2.0] Architecture Thesis

**4. 2.0 credits in free electives at the 4000-level or higher** **2.0**

**Total Credits** **15.0**

### M. Architecture 2-year stream with Collaborative Specialization in Accessibility (8.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

**1. 1.0 credits in:** **1.0**

ACCS 5001 [0.5] Critical Disability Studies

ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar

**2. 2.5 credits in core:** **2.5**

ARCH 5224 [0.5] Advanced Building Systems

ARCH 5333 [0.5] Selected Topics in Architectural Theory

ARCH 5444 [0.5] Comprehensive Studio Workshop

ARCH 5551 [0.5] Professional Practice

ARCH 5552 [0.5] Design Thesis Preparation

**3. 2.0 credits in studio:** **2.0**

ARCH 5114 [1.0] Comprehensive Studio: Climate + Integration

ARCH 5115 [1.0] Graduate Studio Abroad: Agency + Justice

**4. 2.0 credits in:** **2.0**

ARCH 5555 [2.0] Architecture Thesis (in the Specialization)

**5. 0.5 credits in free electives at the 4000-level or higher** **0.5**

**Total credits** **8.0**

### M. Architecture 3-year stream with Collaborative Specialization in Accessibility (15.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

**1. 1.0 credit in:** **1.0**

ACCS 5001 [0.5] Critical Disability Studies

ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar

**2. 6.0 credits in core:** **6.0**

ARCH 5221 [0.5] Ecological & Regulatory Systems

ARCH 5222 [0.5] Structures

ARCH 5223 [1.0] Assemblies and Environmental Systems

ARCH 5224 [0.5] Advanced Building Systems

ARCH 5331 [0.5] Modernism and Global Urbanism

ARCH 5332 [0.5] Contemporary Theories in Architecture

ARCH 5333 [0.5] Selected Topics in Architectural Theory

ARCH 5441 [0.5] Studio 1: Workshop

ARCH 5444 [0.5] Comprehensive Studio Workshop

ARCH 5551 [0.5] Professional Practice

ARCH 5552 [0.5] Design Thesis Preparation

**3. 5.0 credits in studio:** **5.0**

ARCH 5111 [1.0] Studio I: Land & Environment

ARCH 5112 [1.0] Studio II: Materiality + Adaptation

ARCH 5113 [1.0] Studio III: Urbanism + Society

ARCH 5114 [1.0] Comprehensive Studio: Climate + Integration

ARCH 5115 [1.0] Graduate Studio Abroad: Agency + Justice

**4. 2.0 credits in:** **2.0**

ARCH 5555 [2.0] Architecture Thesis (in the Specialization)

**5. 1.0 credits in free electives at the 4000-level or higher** **1.0**

**Total Credits** **15.0**

### M. Architecture 2-year stream with Collaborative Specialization in Climate Change (8.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

**1. 1.0 credit in:** **1.0**

CLIM 5000 [1.0] Climate Collaboration

**2. 0.0 credit in:**

CLIM 5800 [0.0] Climate Seminar Series

**3. 2.5 credits in core:** **2.5**

ARCH 5224 [0.5] Advanced Building Systems

ARCH 5333 [0.5]	Selected Topics in Architectural Theory	
ARCH 5444 [0.5]	Comprehensive Studio Workshop	
ARCH 5551 [0.5]	Professional Practice	
ARCH 5552 [0.5]	Design Thesis Preparation	
<b>4. 2.0 credits in studio:</b>		<b>2.0</b>
ARCH 5114 [1.0]	Comprehensive Studio: Climate + Integration	
ARCH 5115 [1.0]	Graduate Studio Abroad: Agency + Justice	
<b>5. 2.0 credits in:</b>		<b>2.0</b>
ARCH 5555 [2.0]	Architecture Thesis	
Thesis topic must be related to climate change.		
<b>6. 0.5 credits in free electives at the 4000-level or higher</b>		<b>0.5</b>
<b>Total Credits</b>		<b>8.0</b>

### M. Architecture 3-year stream with Collaborative Specialization in Climate Change (15.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 6.0 credits in core:</b>		<b>6.0</b>
ARCH 5221 [0.5]	Ecological & Regulatory Systems	
ARCH 5222 [0.5]	Structures	
ARCH 5223 [1.0]	Assemblies and Environmental Systems	
ARCH 5224 [0.5]	Advanced Building Systems	
ARCH 5331 [0.5]	Modernism and Global Urbanism	
ARCH 5332 [0.5]	Contemporary Theories in Architecture	
ARCH 5333 [0.5]	Selected Topics in Architectural Theory	
ARCH 5441 [0.5]	Studio 1: Workshop	
ARCH 5444 [0.5]	Comprehensive Studio Workshop	
ARCH 5551 [0.5]	Professional Practice	
ARCH 5552 [0.5]	Design Thesis Preparation	
<b>4. 5.0 credits in studio:</b>		<b>5.0</b>
ARCH 5111 [1.0]	Studio I: Land & Environment	
ARCH 5112 [1.0]	Studio II: Materiality + Adaptation	
ARCH 5113 [1.0]	Studio III: Urbanism + Society	
ARCH 5114 [1.0]	Comprehensive Studio: Climate + Integration	
ARCH 5115 [1.0]	Graduate Studio Abroad: Agency + Justice	
<b>5. 2.0 credits in:</b>		<b>2.0</b>
ARCH 5555 [2.0]	Architecture Thesis (in the Specialization)	
<b>6. 1.0 credits in free electives at the 4000-level or higher</b>		<b>1.0</b>
<b>Total Credits</b>		<b>15.0</b>

### Ph.D. Architecture (6.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

<b>1. 2.5 credits in core courses</b>		<b>2.5</b>
ARCN 6001 [0.5]	Workshop: Design as Research I	
ARCH 6001 [0.5]	Texts, Precedents and Writings in Architecture I	
ARCH 6103 [0.5]	Colloquium I: Architectural Research Methods	
ARCH 6104 [0.5]	Colloquium II: Architectural Research Presentation	
ARCH 6105 [0.5]	Colloquium III: Architectural Research Dissemination	
<b>2. 2.0 credits in:</b>		<b>2.0</b>
ARCH 6907 [1.0]	Ph.D. Comprehensive Examination	
ARCH 6908 [1.0]	Ph.D. Proposal Examination	
<b>3. 0.0 credits in:</b>		
ARCH 6909 [0.0]	Ph.D. Dissertation (Oral Defence)	
<b>4. 1.5 credits in free electives</b>		<b>1.5</b>
Students can take any course in any discipline at the 5000-level or above to fulfill their free electives. ARCH 6002 and ARCN 6002 are recommended.		
<b>Total Credits</b>		<b>6.0</b>

### Ph.D. Architecture with Collaborative Specialization in African Studies (6.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

<b>1. 2.5 credits in core courses</b>		<b>2.5</b>
ARCN 6001 [0.5]	Workshop: Design as Research I	
ARCH 6001 [0.5]	Texts, Precedents and Writings in Architecture I	
ARCH 6103 [0.5]	Colloquium I: Architectural Research Methods	
ARCH 6104 [0.5]	Colloquium II: Architectural Research Presentation	
ARCH 6105 [0.5]	Colloquium III: Architectural Research Dissemination	
<b>2. 2.0 credits in:</b>		<b>2.0</b>
ARCH 6907 [1.0]	Ph.D. Comprehensive Examination	
ARCH 6908 [1.0]	Ph.D. Proposal Examination	
<b>3. 0.0 credit in:</b>		
ARCH 6909 [0.0]	Ph.D. Dissertation (Includes oral defence. Thesis must be related to African Studies and will be supervised by a faculty member with expertise in Africa and Africa related research in the primary unit. It may also be co-supervised by an IAS faculty member. )	
<b>4. 1.0 credits in:</b>		<b>1.0</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	

<b>5. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0] Scholarly Preparation in African Studies	
<b>6. 0.5 credit in free elective at the 5000-level in any discipline.</b>	0.5
<b>Total Credits</b>	<b>6.0</b>

## Graduate Diploma in Architectural Conservation (4.0 credits)

Note: Please consult the School regarding registration sequence.

### Requirements:

<b>1. 1.5 credits in:</b>	1.5
CDNS 5401 [0.5] Heritage Conservation: History, Principles, and Concepts	
CDNS 5402 [0.5] Heritage Conservation: Theory in Practice	
CDNS 5403 [0.5] Heritage Conservation and Sustainability	
<b>2. 1.0 credits in:</b>	1.0
ARCH 4002 [0.5] Canadian Architecture	
ARCH 4200 [0.5] Architectural Conservation Philosophy and Ethics	
<b>3. 1.5 credits in:</b>	1.5
ARCC 5401 [0.5] Workshop: Technical Studies in Heritage Conservation	
ARCH 5402 [0.5] Evaluation of Existing Properties	
ARCH 5404 [0.5] Advanced Building Assessment	
<b>Total Credits</b>	<b>4.0</b>

## Regulations

See the General Regulations section of this Calendar.

### M. Architecture

Architecture permits the C+ option in the 15.5-credit M.Arch. 1 curriculum only. (See Section 11.2 of the General Regulations).

### Admission Requirements

#### Master of Architecture (M.Arch.)

##### Two-year M.Arch. (8.0 credits)

A four-year honours undergraduate degree or its equivalent in architecture, with significant studio experience in architectural design, and a minimum overall standing of B-.

##### Three-year M.Arch. (15.5 credits)

A four-year honours undergraduate degree from diverse backgrounds with a minimum overall B+ standing.

For the three-year M.Arch., all students will apply for the 15.5-credit program. Most will be admitted to the fall term of Year 1. Some applicants possessing a B.A.S. Conservation and Sustainability or an equivalent degree in an environmental design field may be eligible for second entry, to be determined by the Azrieli School of Architecture and Urbanism and Graduate Studies. Students admitted into second entry will be accepted into the winter term of Year 1 and will complete 12.0 credits.

All applicants whose first language is not English must demonstrate proficiency in the English language. See

Section 3.6 of the General Regulations section of this calendar for details.

For more information, please visit <https://carleton.ca/architecture/programs/>

### M. Architectural Studies (M.A.S.)

The Master of Architectural Studies is a non-professional degree for students interested in pursuing in-depth architectural research.

The minimum requirement for admission to the M.A.S. is a four-year honours undergraduate degree in architecture or equivalent, with a minimum overall standing of B-.

All applicants whose first language is not English must demonstrate proficiency in the English language. See Section 3.6 of the General Regulations section of this calendar for details.

For more information visit <https://carleton.ca/architecture/programs/>

### Ph.D. Architecture

The normal requirement for admission to the doctoral program in architecture is a master's degree (or equivalent) in architecture or a related field with a minimum overall standing of A-.

All applicants whose first language is not English must demonstrate proficiency in the English language. See Section 3.6 of the General Regulations section of this calendar for details.

## Graduate Diploma in Architectural Conservation

There are two points of entry into the program:

### Direct Entry

- The normal requirement is a bachelor degree with a minimum average of B+. The program can be taken part-time or full-time.

### Admission from the M.Arch. or M.A.S.

- Students may apply to the Graduate Diploma in Architectural Conservation during the first year of study in the Master of Architecture professional program or the Master of Architectural Studies program.

All applicants whose first language is not English must demonstrate proficiency in the English language. See Section 3.6 of the General Regulations section of this calendar for details.

For more information visit <https://carleton.ca/architecture/programs/>

## **Architecture - MAS (ARCT) Courses**

### **ARCT 5909 [2.0 credits]**

#### **M.A.S. Thesis**

Scholarly written thesis supported by methods of two and three-dimensional representation. Research undertaken by the student is expected to engage a topic in the culture of practice in Architecture. Proposals must be approved by the graduate committee of the Azrieli School of Architecture and Urbanism.(ARCU).

Includes: Experiential Learning Activity

## **Architecture - Studio (ARCS) Courses**

### **ARCS 5030 [1.5 credit]**

#### **M.Arch 1 - Studio 1**

Sensory components of architecture: use, effect, and symbolic potential. Light, lighting, sound, sensation of heat and cold, and related phenomena studied in modes of building proposals. Social considerations of architecture. Conventions of architectural drawing. Computer modeling as a medium of architectural analysis, documentation, and presentation.

### **ARCS 5032 [1.5 credit]**

#### **M.Arch. 1 - Studio II**

Building materials and practices within the context of increasingly complex building programs. Social context of architecture in relation to material expression. Modeling is stressed.

Prerequisite(s): ARCS 5030.

### **ARCS 5033 [1.0 credit]**

#### **M.Arch. 1 - Studio III**

A comprehensive studio dealing with issues of program and site as the culturally defining aspects of architectural practice within complex urban and social situations, using difficult sites and hybrid programs. Projects brought to a high degree of technical, formal, and graphic resolution.

Prerequisite(s): ARCS 5032.

### **ARCS 5105 [1.5 credit]**

#### **Graduate Studio 1**

An architectural investigation within a contemporary urban setting, usually dealing with central-city sites and complex programs. Projects address the question of urban architecture both from practical and theoretical perspectives. Architecturally relevant building technology and systems will be introduced in the Studio as required.

Includes: Experiential Learning Activity

### **ARCS 5106 [1.5 credit]**

#### **Graduate Studio 2**

Architectural design interventions within culturally-significant contexts. Investigate and integrate contextual and theoretical research into a critical position on architecture and its relationship to a wider cultural context. Develop this position using creative and critical methods into a design proposition at architectural, landscape, and/or urban scales.

Includes: Experiential Learning Activity

Prerequisite(s): ARCS 5105.

### **ARCS 5909 [2.0 credits]**

#### **Thesis - Independent Study**

Student-initiated design investigation, developed with a thesis supervisor, supported by text and appropriate methods of two and three-dimensional representation. Proposals must be approved by the Graduate Committee of the Azrieli School of Architecture and Urbanism.

Includes: Experiential Learning Activity

## **Architecture - Technical (ARCC) Courses**

### **ARCC 5000 [0.5 credit]**

#### **Directed Studies in Architecture and Technology**

Reading and research tutorials.

Prerequisite(s): permission of the School.

### **ARCC 5096 [0.5 credit]**

#### **Building Technology I**

General introduction to materials and methods of construction with particular focus on wood and timber frame construction. Site conditions, foundations, structure and envelope in terms of their response to local climate: sun (light and heat), wind, moisture.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 2221.

### **ARCC 5097 [0.5 credit]**

#### **Building Technology II**

Technical issues involved in architectural design of buildings from ancient times to the present. Technological innovation and materials related to structural developments, and the organization and design of structures. Basic concepts of equilibrium, and mechanics of materials. Final projects developed in conjunction with design studio.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 2222.

**ARCC 5098 [0.5 credit]****Building Technology III**

Wood frame, post and beam, steel and concrete systems and construction techniques. Structural systems and building envelope principles and practice are explored in conjunction with mechanical and electrical systems in small buildings. Final projects developed in conjunction with design studio.

Includes: Experiential Learning Activity

**ARCC 5099 [0.5 credit]****Building Technology IV**

Medium scale steel, concrete, and wood frame buildings as case studies to explore approaches to building science principles, building envelope design, advanced construction methods and materials, acoustics and sound control, and fire protection, with a focus on sustainable design strategies and environmental impact.

Includes: Experiential Learning Activity

**ARCC 5100 [0.5 credit]****Advanced Building Systems**

Introduction to advanced design in building technology and systems integration. Leading edge building materials, technologies and philosophies will be explored through intensive case study research and analysis, comparing, and critically evaluating, traditional methods with current computer modeling and analysis techniques.

Includes: Experiential Learning Activity

**ARCC 5200 [0.5 credit]****Professional Practice**

The practice of architecture. Professional organization and conduct, the architect's services, business law, office organization and management, contract documents, building codes, contract management, cost control, accounting and site supervision. Guest speakers and case studies.

Includes: Experiential Learning Activity

Precludes additional credit for ARCU 4200.

**ARCC 5401 [0.5 credit]****Workshop: Technical Studies in Heritage Conservation**

Materials used in conservation of built heritage; conservation philosophy used to preserve those materials. Material, technical, project management, construction sequencing, standards, and code dimensions of Heritage Conservation.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School.

**ARCC 5500 [0.5 credit]****Advanced Design Economics**

Principles of building economics. Determinants and prediction of building costs. Uncertainty and investment economics. Creative cost control for buildings during schematic design, design development, construction document preparation and construction. Economic evaluation during all phases of design process; emphasis on sustainable strategies.

Includes: Experiential Learning Activity

**ARCC 5909 [2.0 credits]****M.Arch. Post-Professional Thesis (Design and Technology)**

Basic or applied research in architectural, industrial, and digital design. Areas include interactive education/training, product/interface design, programming/scripting, culture/technology, or research as defined by the student. Final thesis documentation must satisfy the requirements established by the Faculty of Graduate Studies.

Includes: Experiential Learning Activity

Prerequisite(s): Proposals must be approved by the Graduate Committee of the Azrieli School of Architecture and Urbanism.

**Architecture - Techniques (ARCN) Courses****ARCN 5000 [0.5 credit]****Directed Studies in Computer-Aided Design**

Reading and research tutorials.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School.

**ARCN 5001 [0.5 credit]****Directed Studies in Architecture**

Reading and research tutorials.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School.

**ARCN 5005 [0.5 credit]****Theory and Practice of Architectural Representation**

Free-hand drawing as a way of observing and understanding the world. Various media and techniques introduced through a wide range of studio and outdoor exercises.

Includes: Experiential Learning Activity

**ARCN 5100 [0.5 credit]****Representation and Documentation in Architectural Conservation**

An in-depth study of the conventions and history of heritage recording including traditional field survey, photogrammetry, laser scanning technologies, and hybrid representations.

Workshop, six hours a week (including field trips and on-site work).

**ARCN 5301 [0.5 credit]****Workshop: Design as Research I**

Exploration of architectural modes of research through making such as experimental mediation, prototyping, material exploration, digital crafting, drawing, modelling, or mapping.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as ARCN 6001, for which additional credit is precluded.

**ARCN 5302 [0.5 credit]****Workshop: Design as Research II**

Exploration of architectural modes of research through making such as experimental mediation, prototyping, material exploration, digital crafting, drawing, modelling, or mapping.

Includes: Experiential Learning Activity

Also offered, with different requirements, as ARCN 6002, for which additional credit is precluded.

**ARCN 5909 [2.0 credits]****Thesis - Directed Research Studio (DRS)**

An intensive research-based design project. The unit is initiated and guided by a faculty member engaged in organized research. Proposals must be approved by the Graduate Committee of the Azrieli School of Architecture and Urbanism.

Includes: Experiential Learning Activity

**ARCN 6001 [0.5 credit]****Workshop: Design as Research I**

Exploration of architectural modes of research through making such as experimental mediation, prototyping, material exploration, digital crafting, drawing, modelling, or mapping.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as ARCN 5301, for which additional credit is precluded.

**ARCN 6002 [0.5 credit]****Workshop: Design as Research II**

Exploration of architectural modes of research through making such as experimental mediation, prototyping, material exploration, digital crafting, drawing, modelling, or mapping. This course is offered as an elective to graduate students in architecture.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as ARCN 5302, for which additional credit is precluded.

**ARCN 6901 [0.5 credit]****Placement in Architecture**

An opportunity to earn academic credit by engaging in research activities under the supervision of a professional architect or researcher in architectural, government, non-governmental or other professional settings. Placement research must be related to the preparation of the doctoral research. Design Studios/Design Thesis/Research (ARCS).

Includes: Experiential Learning Activity

**Architecture - Theory/History (ARCH) Courses****ARCH 5000 [0.5 credit]****Directed Studies in History and Theory of Architecture**

Reading and research tutorials.

Prerequisite(s): permission of the School.

**ARCH 5001 [0.5 credit]****Topics in Architecture**

An introduction to the intellectual frameworks connecting design and culture as manifest in theories of culture and architecture. The seminar builds on previous undergraduate studies, and is not an introduction to these fields. The field of inquiry is both historical and contemporary.

**ARCH 5002 [0.5 credit]****Architecture Seminar II**

A continuation of ARCH 5001, this seminar follows the same general description, but concentrates more on architectural design, on the contemporary condition, and on the ways of thinking that characterize embodiment of cultural content in architecture and other artifacts.

Prerequisite(s): ARCH 5001.

**ARCH 5003 [0.5 credit]****Design and Culture Workshop**

The prime objective of the workshop is to investigate cultural issues in architectural design. The workshop operates as a directed study with specific content, objectives, and scheduling arranged between student and academic advisor.

Includes: Experiential Learning Activity

**ARCH 5010 [0.5 credit]****History and Theory of Modern Architecture**

Architectural and urban ideals of modernism with emphasis upon the development of the avant-garde in the early twentieth century. The phenomenon of modern architecture within the broader framework of the development of western thought.

**ARCH 5020 [0.5 credit]****Theories of Modernity**

Theories of modernity (including recent developments in cultural theory, theorizing from the Global South and more, recent technological and socio-political transformations) and how they help shape contemporary architectural discourse.

Precludes additional credit for ARCH 4332.

**ARCH 5100 [0.5 credit]****Directed Studies in Architecture and Society**

Reading and research tutorials.

Prerequisite(s): permission of the School.

**ARCH 5103 [0.5 credit]****Colloquium I: Architectural Research Methods**

This seminar brings together graduate students with architectural faculty to discuss in-progress work and ideas. Immersion in conventions of theoretical and methodological approaches to advanced architectural research, including research ethics, proposal writing and research funding.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 5101 (no longer offered).

Also offered at the undergraduate level, with different requirements, as ARCH 6103, for which additional credit is precluded.

**ARCH 5104 [0.5 credit]****Colloquium II: Architectural Research Presentation**

This seminar brings together graduate students with architectural faculty to discuss in-progress work and ideas. Immersion in conventions of theoretical and methodological approaches to advanced architectural research, including research ethics, proposal writing and research funding.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 5101 (no longer offered).

Also offered at the undergraduate level, with different requirements, as ARCH 6104, for which additional credit is precluded.

**ARCH 5111 [1.0 credit]****Studio I: Land & Environment**

Design studio exploring relationship of buildings to land and environment in a peri-urban or rural context. Students gain skills in context analysis, siting, fieldwork, and design development with particular focus on spatial sequencing and tectonic development of a small-scale building with community-focused program.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 5030.

**ARCH 5112 [1.0 credit]****Studio II: Materiality + Adaptation**

Design studio exploring adaptive reuse of a medium-sized cultural building in an urban context. Students gain skills in program analysis, detailing and material assembly, and consider environmental impacts of material selection.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 5032.

Prerequisite(s): ARCS 5030 or ARCH 5111.

**ARCH 5113 [1.0 credit]****Studio III: Urbanism + Society**

Design studio applying urban design principles to the design of a medium scale building and its adjacent public realm. Students analyze historical and current urban development patterns and regulations to design a housing or mixed-use project with social significance in the public domain.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 5033.

Prerequisite(s): ARCH 5112 or ARCS 5032.

**ARCH 5114 [1.0 credit]****Comprehensive Studio: Climate + Integration**

Design studio exploring comprehensive design of a mid-size low-carbon building to a high degree of resolution with regards to structural and environmental systems integration and envelope design. Includes review of building energy systems and considers environmental stewardship across scales in light of climate change.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 5105.

**ARCH 5115 [1.0 credit]****Graduate Studio Abroad: Agency + Justice**

Design studio exploring diverse cultural contexts through integrated travel and visiting guest critics. Students develop a critical position on architecture and its agency in addressing social and environmental injustices in the wider world through design of a landscape, urban, or building-scale intervention.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 5106.

Prerequisite(s): ARCS 5105 or ARCH 5114.

**ARCH 5200 [0.5 credit]****Graduate Seminar 1: Introduction to Critical Thought in Architecture**

Critical theories and research approaches relevant to the field of architecture. Identification of issues through a coordinated series of lectures and readings. Development of analytical and interpretative skills through seminar discussions and writing culminating in a scholarly position paper by the student.

**ARCH 5201 [0.5 credit]****Graduate Seminar 2: Contemporary Theoretical Perspectives in Architecture**

Lectures, readings, and case studies on contemporary issues in architecture and allied fields of study. Critical analysis of trends and possibilities set against traditional modes of architectural thought and practice. This course serves as a forum for a preliminary articulation of the thesis proposal.

Includes: Experiential Learning Activity

Prerequisite(s): ARCH 5200.

**ARCH 5221 [0.5 credit]****Ecological & Regulatory Systems**

Lecture-based course considering buildings' ecological and climate change impacts. Course covers how regulations, material choices, siting, and assembly methods of small-scale buildings impact energy consumption, carbon footprints, and GHG emissions. Regulatory content includes applicable codes, regulations, best practices, universal design standards and life-safety systems principles.

Precludes additional credit for ARCC 5096, ARCC 2202.

Also offered at the undergraduate level, with different requirements, as ARCH 2221, for which additional credit is precluded.

**ARCH 5222 [0.5 credit]****Structures**

Fundamental structural principles and their building design applications. Concepts of equilibrium and mechanics of materials, including stress and strain. Structural calculations and qualitative understanding of static and dynamic loads, including gravitational and lateral forces. Includes consideration of wood, masonry, concrete, and steel structures.

Includes: Experiential Learning Activity

Precludes additional credit for ARCC 5097, CIVE 2005.

Prerequisite(s): ARCH 5221.

Also offered at the undergraduate level, with different requirements, as ARCH 2222, for which additional credit is precluded.

**ARCH 5223 [1.0 credit]****Assemblies and Environmental Systems**

Lecture and workshop course introducing principles of environmental mediation through building assemblies, MEP, daylight and acoustic design in new and existing commercial and multi-story residential buildings. Emphasis on climate adaptation and mitigation through life cycle analysis and energy and performance assessment.

Includes: Experiential Learning Activity

Precludes additional credit for ARCC 5098, ARCH 3221.

**ARCH 5224 [0.5 credit]****Advanced Building Systems**

Lecture-based technology course focusing on skillful application of building systems, including envelope, material and structural selection, and active and passive environmental systems. Emphasis on design integration and on alternatives to conventional construction including healthy material systems, designing for decommissioning, and speculative adaptation.

Includes: Experiential Learning Activity

Precludes additional credit for ARCC 5100.

Prerequisite(s): ARCH 5221 or equivalent experience.

**ARCH 5301 [0.5 credit]****Texts, Precedents and Writings in Architecture I**

Exploration of significant texts, precedents, and theories in architecture, situating key ideas as they emerge at the intersection of history, theory, and society.

**ARCH 5302 [0.5 credit]****Texts, Precedents and Writings in Architecture II**

Exploration of significant texts, precedents, and theories in architecture, situating key ideas as they emerge at the intersection of history, theory, and society.

**ARCH 5331 [0.5 credit]****Modernism and Global Urbanism**

Thematic survey of cities, modernist ideas, projects, and movements, considering their theoretical, historical, and practical expressions in urban morphology and housing typologies, and their relation to larger societal and environmental questions, locally and globally. Acquisition of critical reading, writing, and representation skills through case-study.

Precludes additional credit for ARCH 5010, ARCH 2300.

Also offered at the undergraduate level, with different requirements, as ARCH 2331, for which additional credit is precluded.

**ARCH 5332 [0.5 credit]****Contemporary Theories in Architecture**

Survey of cultural theories from the beginning of colonialism to this day. Considerations of how technological, socio-political, material, and ecological transformations inform architectural discourse. Students acquire research skills, considering topics such as race, gender, disability, environmental justice, Indigenous worldviews, climate, decolonisation, or artificial intelligence.

Precludes additional credit for ARCH 5020.

Also offered at the undergraduate level, with different requirements, as ARCH 4332, for which additional credit is precluded.

**ARCH 5333 [0.5 credit]****Selected Topics in Architectural Theory**

Lectures, readings, and case studies on contemporary issues in architecture and allied fields of study. Critical analysis of trends and possibilities beyond traditional modes of architectural thought and practice. Themes vary, drawing on faculty and student research, and engaging various modes of architectural research.

Precludes additional credit for ARCH 5201.

**ARCH 5402 [0.5 credit]****Evaluation of Existing Properties**

The cultural, political, economic, and legal factors that shape our definition of and approaches to existing architecture. Processes for and implications of heritage designation, cultural value, and costs associated with restoration and ongoing preservation of heritage and other existing properties. (Theory/History Elective).

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as ARCH 4883, for which additional credit is precluded.

**ARCH 5404 [0.5 credit]****Advanced Building Assessment**

In-depth study of the conventions, methods, and tools used in the assessment of buildings and their sites including traditional field survey, photogrammetry, laser scanning technologies, and hybrid representations.

Includes: Experiential Learning Activity

Precludes additional credit for ARCN 5100.

Also offered at the undergraduate level, with different requirements, as ARCH 4881, for which additional credit is precluded.

**ARCH 5441 [0.5 credit]****Studio 1: Workshop**

Workshop supporting Studio 1 project development. Lectures, tutorials, and/or workshops foreground fundamental skills and expose students to broad range of analog and digital modes of drawing, modelling and mapping, as well as to theories of architectural representation.

Includes: Experiential Learning Activity

Precludes additional credit for ARCN 5005.

**ARCH 5444 [0.5 credit]****Comprehensive Studio Workshop**

Workshop supporting Comprehensive Studio project development. Lectures, tutorials, and/or workshops enable students to test, develop, and assess their studio project with regards to select material, energetic, regulatory, and/or ecological parameters of the project.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 5105.

**ARCH 5551 [0.5 credit]****Professional Practice**

The architectural profession, its rules, regulations, internship and licensure's paths. Ethical and legal responsibilities, including professional contracts, codes, and intellectual property rights. Types of practice organization, financial management, procurement, and risk mitigation. Project management and delivery, including building economics, cost control, work plans, and schedules.

Precludes additional credit for ARCC 5200.

**ARCH 5552 [0.5 credit]****Design Thesis Preparation**

Lectures and workshops introducing methods, resources, and approaches to completing a design research architecture thesis. Course introduces students to topics such as writing support, library resources, conducting fieldwork, physical prototyping, community engagement, use of AI, and ethics approval processes. Course culminates in thesis proposal.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 5200.

**ARCH 5555 [2.0 credits]****Architecture Thesis**

Intensive design-research thesis supported by a faculty supervisor. Students will synthesize academic writing with a design exploration of a topic of architectural significance using a range of appropriate and inventive design and research methods.

Includes: Experiential Learning Activity

Precludes additional credit for ARCN 5909.

Prerequisite(s): ARCH 5115 or ARCS 5106.

**ARCH 6001 [0.5 credit]****Texts, Precedents and Writings in Architecture I**

Exploration of significant texts, precedents, and theories in architecture, situating key ideas as they emerge at the intersection of history, theory, and society.

**ARCH 6002 [0.5 credit]****Texts, Precedents and Writings in Architecture II**

Exploration of significant texts, precedents, and theories in architecture, situating key ideas as they emerge at the intersection of history, theory, and society.

**ARCH 6103 [0.5 credit]****Colloquium I: Architectural Research Methods**

This seminar brings together doctoral students with architectural faculty to present their work-in-progress. Immersion in conventions of theoretical and methodological approaches to advanced architectural research, including research ethics, proposal writing and research funding. This course is required of all first year doctoral students in architecture.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 6101 (no longer offered).

Also offered at the undergraduate level, with different requirements, as ARCH 5103, for which additional credit is precluded.

**ARCH 6104 [0.5 credit]****Colloquium II: Architectural Research Presentation**

This seminar continues to bring together doctoral students with architectural faculty and guest lecturers to present their work-in-progress. This course is required of all students enrolled in the Ph.D. program from the second year through until completion of the dissertation.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as ARCH 5104, for which additional credit is precluded.

**ARCH 6105 [0.5 credit]****Colloquium III: Architectural Research Dissemination**

This seminar continues to bring together doctoral students with architectural faculty and guest lecturers to present work-in-progress, discussing applications to different forms, modes, and venues for research dissemination.

Includes: Experiential Learning Activity

**ARCH 6907 [1.0 credit]****Ph.D. Comprehensive Examination**

Students must demonstrate to their thesis advisory committees a sufficiently broad background in the theoretical and topical area literatures and constructions relevant to their individual projects.

**ARCH 6908 [1.0 credit]****Ph.D. Proposal Examination**

Students must demonstrate to thesis advisory committees their ability to link theory to a work or practice of architecture. This examination requires the preparation of a drawing or a model, to then be discussed within a theoretical framework during the oral part of the exam.

**ARCH 6909 [0.0 credit]****Ph.D. Dissertation**

The dissertation will be comprised of two critical modes of investigation of equal importance: a speculative project and a research text. The speculative project is realized using specific traditional and non-traditional media as deemed appropriate.

Includes: Experiential Learning Activity

**Architecture - Urban (ARCU) Courses****ARCU 5000 [0.5 credit]****Directed Studies in Architecture and the City**

Reading and research tutorials.

Includes: Experiential Learning Activity

**ARCU 5402 [0.5 credit]****Workshop: Urban Studies in Heritage Conservation**

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School.

# Art and Architectural History

This section presents the requirements for programs in:

- **M.A. Art and Architectural History with Collaborative Specialization in Digital Humanities**

## Program Requirements

**M.A. Art and Architectural History (4.0 credits)**

### Requirements - Thesis pathway (4.0 credits)

#### 1. 1.0 credit in: 1.0

ARTH 5010 [1.0] Theory and Practice of Art and Architectural History

#### 2. 0.5 credit from: 1.5

ARTH 5112 [0.5] Special Topics in Historiography, Methodology and Criticism

ARTH 5113 [0.5] Special Topics in Pre-Modernity

ARTH 5114 [0.5] Special Topics in Feminism and Gender

ARTH 5115 [0.5] Special Topics in Modern and Contemporary Art

ARTH 5117 [0.5] Special Topics in Community/ Identity

ARTH 5210 [0.5] Special Topics in Indigenous Art

ARTH 5218 [0.5] Special Topics in Museum Studies and Curatorial Practice

ARTH 5220 [0.5] Special Topics in Global Art/ Architectural History

ARTH 5403 [0.5] Special Topics in Architecture and Its Institutions

ARTH 5500 [0.5] Special Topics in Photography and Its Institutions

**3. 1.0 credit in Art and Architectural History.** Maximum of 1.0 credit in practicum, maximum 0.5 credit in elective outside the discipline, approved by the Graduate Supervisor.

**4. 0.5 credit from** the 1.5 credits taken in Items 2 and 3 above must be in an area outside that of the student's thesis specialization.

#### 5. 1.5 credits in: 1.5

ARTH 5909 [1.5] M. A. Thesis

#### 6. 0.0 credit in: 0.0

ARTH 5800 [0.0] Carleton Art Forum

#### 7. Language Requirement:

Students are required to demonstrate knowledge of a second language.

**Total Credits 4.0**

### Requirements - Research Essay pathway (4.0 credits):

#### 1. 1.0 credit in: 1.0

ARTH 5010 [1.0] Theory and Practice of Art and Architectural History

#### 2. 0.5 credit from: 2.0

ARTH 5112 [0.5] Special Topics in Historiography, Methodology and Criticism

ARTH 5113 [0.5] Special Topics in Pre-Modernity

ARTH 5114 [0.5] Special Topics in Feminism and Gender

ARTH 5115 [0.5] Special Topics in Modern and Contemporary Art

ARTH 5117 [0.5] Special Topics in Community/ Identity

ARTH 5210 [0.5] Special Topics in Indigenous Art

ARTH 5218 [0.5] Special Topics in Museum Studies and Curatorial Practice

ARTH 5220 [0.5] Special Topics in Global Art/ Architectural History

ARTH 5403 [0.5] Special Topics in Architecture and Its Institutions

ARTH 5500 [0.5] Special Topics in Photography and Its Institutions

**3. 1.5 credits in Art and Architectural History.** May include a maximum of 1.0 credit in practicum, and 0.5 credit in elective outside the discipline, approved by the Graduate Supervisor.

**4. 0.5 credit from** the 2.0 credits taken in Items 2 and 3 above must be in an area outside that of the student's research essay specialization.

#### 5. 1.0 credit in: 1.0

ARTH 5908 [1.0] Major Research Project

#### 6. 0.0 credit in: 0.0

ARTH 5800 [0.0] Carleton Art Forum

#### 7. Language Requirement:

Students are required to demonstrate knowledge of a second language.

**Total Credits 4.0**

### Requirements - Coursework pathway (4.0 credits):

#### 1. 1.0 credit in: 1.0

ARTH 5010 [1.0] Theory and Practice of Art and Architectural History

#### 2. 1.0 credit from: 1.0

ARTH 5112 [0.5] Special Topics in Historiography, Methodology and Criticism

ARTH 5113 [0.5] Special Topics in Pre-Modernity

ARTH 5114 [0.5] Special Topics in Feminism and Gender

ARTH 5115 [0.5] Special Topics in Modern and Contemporary Art

ARTH 5117 [0.5] Special Topics in Community/ Identity

ARTH 5210 [0.5] Special Topics in Indigenous Art

ARTH 5218 [0.5] Special Topics in Museum Studies and Curatorial Practice

ARTH 5220 [0.5] Special Topics in Global Art/ Architectural History

ARTH 5403 [0.5] Special Topics in Architecture and Its Institutions

ARTH 5500 [0.5] Special Topics in Photography and Its Institutions

**3. 2.0 credits in Art and Architectural History.** May include a maximum of 1.0 credit in practicum, and 0.5 credit in elective outside the discipline, approved by the Graduate Supervisor.

#### 4. 0.0 credit in: 0.0

ARTH 5800 [0.0] Carleton Art Forum

#### 5. Language Requirement:

Students are required to demonstrate knowledge of a second language.

**Total Credits 4.0**

## Notes:

- A maximum of 1.0 credit may be selected from course offerings at the 4000-level in Art and Architectural History.
- To enter the thesis stream, students are required to notify the Graduate Supervisor of their intent at the beginning of their first term of study. The thesis (60-80 pages) is written under the supervision of a faculty member with both expertise and an interest in the student's topic. The Graduate Committee will determine whether a student is eligible to enter the thesis stream after one term of study in the case of full-time students and after two terms of study in the case of part-time students. For those students allowed into the thesis stream, the deadline for the submission of the thesis proposal to the Graduate Committee is normally no later than April 15 of the first year of study for students enrolled full-time, and no later than the middle of the fifth term of registration for students enrolled part-time.

## M.A. Art and Architectural History with Collaborative Specialization in Digital Humanities (4.5 credits)

### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>	1.0
ARTH 5010 [1.0]	Theory and Practice of Art and Architectural History
<b>2. 0.5 credit in ARTH, which can include ARTH 5011</b>	0.5
<b>3. 0.5 credit in:</b>	0.5
ARTH 5011 [0.5]	Graduate Practicum
<b>4. 0.0 credit in:</b>	0.0
ARTH 5800 [0.0]	Carleton Art Forum
<b>5. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>6. 0.5 credit in Digital Humanities (DIGH 5011, DIGH 5012, or annually listed Digital Humanities Course)</b>	0.5
<b>7. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>8. 1.5 credit in:</b>	1.5
ARTH 5909 [1.5]	M. A. Thesis
<b>9. Language Requirement:</b>	
Students are required to demonstrate knowledge of a second language.	
<b>Total Credits</b>	<b>4.5</b>

### Requirements - Major Research Project pathway:

<b>1. 1.0 credit in:</b>	1.0
ARTH 5010 [1.0]	Theory and Practice of Art and Architectural History
<b>2. 1.0 credits in ARTH graduate coursework, 0.5 credits of which can include ARTH 5011.</b>	1.0
<b>3. 0.5 credits in:</b>	0.5
ARTH 5011 [0.5]	Graduate Practicum
<b>4. 0.0 credit in:</b>	0.0
ARTH 5800 [0.0]	Carleton Art Forum
<b>5. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities

<b>6. 0.5 credit in Digital Humanities (DIGH 5011, DIGH 5012, or annually listed Digital Humanities course)</b>	0.5
<b>7. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>8. 1.0 credit in:</b>	1.0
ARTH 5908 [1.0]	Major Research Project
<b>9. Language Requirement:</b>	
Students are required to demonstrate knowledge of a second language.	
<b>Total Credits</b>	<b>4.5</b>

### Requirements - Coursework pathway:

<b>1. 1.0 credit in:</b>	1.0
ARTH 5010 [1.0]	Theory and Practice of Art and Architectural History
<b>2. 2.0 credits in ARTH, 0.5 credits of which can include ARTH 5011.</b>	2.0
<b>3. 0.5 credit in:</b>	0.5
ARTH 5011 [0.5]	Graduate Practicum (with a Digital Humanities focus)
<b>4. 0.0 credit in:</b>	0.0
ARTH 5800 [0.0]	Carleton Art Forum
<b>5. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>6. 0.5 credit in Digital Humanities (DIGH 5011, DIGH 5012, or annually listed Digital Humanities course)</b>	0.5
<b>7. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>8. Language Requirement:</b>	
Students are required to demonstrate knowledge of a second language.	
<b>Total Credits</b>	<b>4.5</b>

## Regulations

See the General Regulations section of this Calendar.

Academic standing: a standing of B- or better must be obtained in each credit counted towards the master's degree.

Regulations governing requirements for the master's thesis, including deadlines for submission, are outlined in the General Regulations section of this Calendar.

## Admission

The minimum requirement for admission to the master's program is an honours bachelor's degree (or the equivalent) in art history, history and theory of architecture, or a related discipline, with at least high honours standing. Related disciplines may include architectural studies, anthropology, history, and Canadian studies. Applicants without a background in art or architectural history may be required to take up to a maximum of 2.0 credits in certain designated courses from the undergraduate art history program in addition to their regular program.

## Qualifying-Year Program

Applicants who do not qualify for direct admission to the master's program may be admitted to a qualifying-year program. Applicants who lack an honours degree, but

have a three-year degree with honours standing (at least B overall) will normally be admitted to a qualifying-year program. Refer to the General Regulations section of this Calendar.

## **Art and Architectural History (ARTH) Courses**

### **ARTH 5010 [1.0 credit]**

#### **Theory and Practice of Art and Architectural History**

Theory and practice of art and architectural history through consideration of their institutions and mediations. Canadian contexts are emphasized.

### **ARTH 5011 [0.5 credit]**

#### **Graduate Practicum**

Practical on-site work in the collecting institutions of the National Capital Region (as available), including a written assignment. The practicum coordinator and the on-site supervisor jointly determine the final mark. A maximum of 1.0 practicum credit may be applied towards degree requirements.

Includes: Experiential Learning Activity

Precludes additional credit for ARTH 5001.

### **ARTH 5012 [0.5 credit]**

#### **Directed Readings and Research**

Students pursue topics in art and its institutions, which they select in consultation with the graduate faculty of the program.

Includes: Experiential Learning Activity

Precludes additional credit for ARTH 5002.

### **ARTH 5112 [0.5 credit]**

#### **Special Topics in Historiography, Methodology and Criticism**

Historiographical, methodological, and critical issues in the history of art and criticism in Canadian and/or international contexts. Topics may vary from year to year, and will be posted on the School for Studies in Art and Culture website.

### **ARTH 5113 [0.5 credit]**

#### **Special Topics in Pre-Modernity**

Issues in premodern art and institutions of art production, and critical theory in light of current concerns and new research. Topics may vary from year to year, and will be posted on the School for Studies in Art and Culture website.

### **ARTH 5114 [0.5 credit]**

#### **Special Topics in Feminism and Gender**

Art and its institutions in terms of critical issues of feminism and gender studies. Topics include the questioning of the canon, sexuality, the gaze, queer theory, the body, and the use of art as a means to communicate issues of public significance. Topics vary.

### **ARTH 5115 [0.5 credit]**

#### **Special Topics in Modern and Contemporary Art**

The production and reception of modern and contemporary art in light of current concerns in Canadian and/or international contexts. Topics may vary from year to year, and will be posted on the School for Studies in Art and Culture website.

### **ARTH 5117 [0.5 credit]**

#### **Special Topics in Community/Identity**

Art and the interrelationships among the artist, architect, patron, critic and public in the context of the contribution of art and its institutions to the articulation or constitution of communal identities in Canadian and/or international contexts. Topics may vary from year to year.

### **ARTH 5118 [0.5 credit]**

#### **Special Topics in Modern Design**

Topics in the history of modern design, ranging from considerations of designed objects and spaces to the historiography of design.

### **ARTH 5210 [0.5 credit]**

#### **Special Topics in Indigenous Art**

The creative production, aesthetic culture, and reception of selected indigenous peoples in pre-contact, historic, and/or modern time, drawing on postcolonial and critical theory. Topics may vary from year to year, and will be posted on the School for Studies in Art and Culture website.

### **ARTH 5218 [0.5 credit]**

#### **Special Topics in Museum Studies and Curatorial Practice**

Aspects of museum practice, history and theoretical discourse will be examined in a classroom setting, or the preparation, realization, and/or study of an exhibition in an Ottawa-area museum. Topics may vary from year to year.

### **ARTH 5220 [0.5 credit]**

#### **Special Topics in Global Art/Architectural History**

Special topics in the history and theory of global art and/or architectural history, engaging critically with scales, theories, and practices of the global. The course explores frameworks that may include circulation studies, decolonization, diaspora, difficult histories, migration, transnationalism, transnationalism, postcolonial theory, solidarities, and worlding.

### **ARTH 5230 [0.5 credit]**

#### **Special Topics in Islamic Architecture and Art**

Topics in Islamic architecture and art.

**ARTH 5403 [0.5 credit]****Special Topics in Architecture and Its Institutions**

Specialized topics examine theory and practice of architects, architectural historians and critics from historical and contemporary perspectives in Canadian and/or international contexts. Topics may vary from year to year, and will be posted on the School for Studies in Art and Culture website.

**ARTH 5404 [0.5 credit]****Special Topics in Architecture in Canada**

Examination of aspects of the designed environment in Canada.

**ARTH 5500 [0.5 credit]****Special Topics in Photography and Its Institutions**

Photographic practice and reception with emphasis on social, political and cultural contexts and theoretical approaches to the study of photographs in Canadian and/or international contexts. Topics may vary from year to year.

**ARTH 5510 [0.5 credit]****Special Topics in the History of Printmaking**

Topics in the history of printmaking.  
Includes: Experiential Learning Activity

**ARTH 5777 [0.5 credit]****Art Exhibition Studio**

This course is a hands-on examination of art exhibition practices that includes site visits and a series of workshops designed to help students create an exhibition proposal for submission to the Carleton University Art Gallery or other space.  
Includes: Experiential Learning Activity

**ARTH 5788 [0.5 credit]****Directed Art Exhibition**

Selected students will be offered the opportunity to put on an exhibition in the Carleton University Art Gallery, in another venue on campus or online.  
Includes: Experiential Learning Activity

**ARTH 5800 [0.0 credit]****Carleton Art Forum**

Students are required to participate as audience members or presenters in scholarly and art community activities such as professional talks, symposia, conferences and art gallery events. The course will be graded as either satisfactory or unsatisfactory based on participation and engagement.  
Includes: Experiential Learning Activity

**ARTH 5908 [1.0 credit]****Major Research Project**

An examination of an approved topic that is in an area of departmental specialization.  
Includes: Experiential Learning Activity

**ARTH 5909 [1.5 credit]****M. A. Thesis**

Includes: Experiential Learning Activity

## Biochemistry

This section presents the requirements for programs in:

- **M.Sc. Biology with Collaborative Specialization in Biochemistry**
- **M.Sc. Chemistry with Collaborative Specialization in Biochemistry**
- **Ph.D. Biology with Collaborative Specialization in Biochemistry**
- **Ph.D. Chemistry with Collaborative Specialization in Biochemistry**

### M.Sc. Biology with Collaborative Specialization in Biochemistry (5.0 credits)

**Requirements:**

<b>1. 1.0 credits in:</b>	<b>1.0</b>
BIOL 5002 [0.5]	Seminar in Biochemistry
BIOL 5004 [0.5]	Advances in Applied Biochemistry
<b>4. 4.0 credits in:</b>	<b>4.0</b>
BIOL 5909 [3.5]	M.Sc. Thesis (in the specialization, including successful oral defence)
<b>Total Credits</b>	<b>5.0</b>

### M.Sc. Chemistry with Collaborative Specialization in Biochemistry (4.5 credits)

**Requirements:**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
BIOC 5800 [0.5]	Seminar in Biochemistry
BIOC 5806 [0.5]	Advances in Applied Biochemistry
<b>2. 0.5 credit in:</b>	<b>0.5</b>
CHEM 5804 [0.5]	Modern Scientific Communication
<b>3. 3.0 credits in:</b>	<b>3.0</b>
CHEM 5909 [3.0]	M.Sc. Thesis (in the Specialization)
<b>Total Credits</b>	<b>4.5</b>

### Ph.D. Biology with Collaborative Specialization in Biochemistry (1.0 credit)

**Requirements:**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
BIOL 5002 [0.5]	Seminar in Biochemistry
BIOL 5004 [0.5]	Advances in Applied Biochemistry
<b>or, for students who have already completed BIOL 5002 and/or BIOL 5004, select from the following:</b>	
BIOL 5105 [0.5]	Methods in Molecular Genetics
BIOL 5106 [0.5]	Laboratory Techniques in Molecular Genetics
BIOL 5502 [0.5]	Selected Topics in Biology
<b>3. 0.0 credits in:</b>	<b>0.0</b>
BIOL 6909 [0.0]	Ph.D. Thesis (in the specialization, including successful oral defence)
<b>Total Credits</b>	<b>1.0</b>

### Ph.D. Chemistry with Collaborative Specialization in Biochemistry (2.5 credits)

**Requirements:**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
BIOC 5800 [0.5]	Seminar in Biochemistry
<b>2. 0.5 credit in:</b>	<b>0.5</b>
BIOC 5806 [0.5]	Advances in Applied Biochemistry
<b>or, only for students who have already completed BIOC 5806, 0.5 credit from the following:</b>	
CHEM 5001 [0.25]	Analytical Mass Spectrometry
CHEM 5109 [0.5]	Advanced Applications in Mass Spectrometry
CHEM 5111 [0.25]	Advanced Topics in Biomolecular Sciences
CHEM 5900 [0.5]	Directed Special Studies
<b>3. 0.5 credit in:</b>	<b>0.5</b>
CHEM 5804 [0.5]	Modern Scientific Communication
<b>4. 1.0 credits in CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department.</b>	<b>1.0</b>
<b>5. Comprehensive examination (see Note below)</b>	<b>0.0</b>
<b>6. Research Proposal (see Note below)</b>	
<b>7. Public lecture, to precede the oral defence</b>	
<b>8. 0.0 credits in:</b>	
CHEM 6909 [0.0]	Ph.D. Thesis (in the specialization)
<b>Total Credits</b>	<b>2.5</b>

#### Note

The Comprehensive Examination examines the depth and breadth of knowledge in the student's own research area.

The Comprehensive Exam needs to be taken at 8 months in the MSc for someone fast-tracking from MSc to PhD, or within the first 8 months of somebody joining the PhD with an MSc.

The Research Proposal involves submission that is both novel and of a sound scientific basis that may be loosely related to the thesis research of the student but not a topic that the student has investigated in any manner. The Research Proposal will be submitted to a committee for oral defense and is normally completed in the ninth term of registration.

Failure to pass either of the Comprehensive Examination or the Research Proposal will result in deregistration from the graduate program.

Students are required to participate in Thesis Advisory Committee (TAC) meetings in terms 2, 5, 8, and 11. If students are unable to defend their dissertation by term 12, further TAC meetings with a plan for completion must occur in term 14 and, if required term 17. All program requirements must be completed within 18 terms (6 years).

#### Regulations

See the General Regulations section of this Calendar, and the regulations pertaining to the participating units offering this specialization.

## Admission

Admission to the collaborative program in Biochemistry is available to students who are admitted in one of the participating programs. To apply to one of the participating programs, please visit the Graduate Studies Admissions page.

## Biochemistry (BIOC) Courses

### BIOC 5010 [0.5 credit]

#### Data Applications in Biochemistry

A project-based workshop at the intersection of data and biochemistry. Students will develop skills for autonomous learning and proficiency in database selection, computational tool integration, data management, introductory programming, statistical analysis, data visualization, and effective communication of biochemically-relevant information.

Prerequisite(s): BIOC 3101 and BIOC 3102, or permission of the Institute.

Also offered at the undergraduate level, with different requirements, as BIOC 4010, for which additional credit is precluded.

Workshop three hours a week.

### BIOC 5800 [0.5 credit]

#### Seminar in Biochemistry

A graduate seminar on current topics in the field of Biochemistry. This course introduces the seminar format and involves student, faculty and invited seminar speakers. The student will present a seminar and submit a report on a current topic in Biochemistry.

Includes: Experiential Learning Activity

Also listed as BIOL 5002, CHEM 5800.

Precludes additional credit for CHEM 6800 (no longer offered).

### BIOC 5806 [0.5 credit]

#### Advances in Applied Biochemistry

A practical hands-on course in the field of Biochemistry. This course is run in a laboratory and will train students in highly specialized technique(s) in Biochemistry. The students will run experiments, gather data, assess and analyze the results and present the findings as a seminar.

Includes: Experiential Learning Activity

Also listed as BIOL 5004, CHEM 5806.

## Bioinformatics (Collaborative Specialization)

This section presents the requirements for programs in:

- **M.A.Sc. Biomedical Engineering with Collaborative Specialization in Bioinformatics**
- **M.Sc. Biology with Collaborative Specialization in Bioinformatics**
- **M.Sc. Mathematics and Statistics with Specialization in Bioinformatics**

## Program Requirements

The student is responsible for fulfilling both the participating unit requirements for the Master's degree, and the requirements of the Collaborative Program.

The minimum requirements of the collaborative program include successful completion of two required courses, and a master's thesis on an approved bioinformatics topic.

### Required courses:

- 0.5 credit in BIOL 5515 Bioinformatics
- 0.5 credit in BIOL 5517 Bioinformatics Seminar
- Thesis - candidates must successfully complete a research thesis on a topic in bioinformatics supervised by a faculty member of the Collaborative Program in Bioinformatics.

### Notes:

1. Students in programs in Biology and Mathematics & Statistics may use BIOL 5515 Bioinformatics to count towards degree requirements; BIOL 5517 Bioinformatics Seminar must be taken in addition to the regular seminar course.
2. Students in Biomedical Engineering may use both BIOL 5515 Bioinformatics and BIOL 5517 Bioinformatics Seminar to count towards degree requirements.
3. In addition, the student's thesis committee or advisory committee may direct the student to take or audit further courses to complement the student's background and research program.

## M.A.Sc. Biomedical Engineering with Collaborative Specialization in Bioinformatics (5.0 credits)

Consult the Bioinformatics section for details regarding admission requirements to this program.

### Requirements - thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
BIOM 5010 [0.5]	Introduction to Biomedical Engineering	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
BIOL 5515 [0.5]	Bioinformatics	
BIOL 5517 [0.5]	Bioinformatics Seminar	
<b>3. 1.0 credit in BIOM (BMG) courses</b>		<b>1.0</b>
<b>4. 2.5 credits in:</b>		<b>2.5</b>
BIOM 5909 [2.5]	M.A.Sc. Thesis (in the specialization)	
<b>5. 0.0 credit in:</b>		<b>0.0</b>

BIOM 5800 [0.0]	Biomedical Engineering Seminar	
<b>Total Credits</b>		<b>5.0</b>
<b>M.Sc. Biology with Collaborative Specialization in Bioinformatics (5.0 credits)</b>		
<b>Requirements:</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
BIOL 5515 [0.5]	Bioinformatics	
BIOL 5517 [0.5]	Bioinformatics Seminar	
<b>2. 4.0 credits in:</b>		<b>4.0</b>
BIOL 5909 [3.5]	M.Sc. Thesis (in the specialization, including successful oral defence)	
<b>Total Credits</b>		<b>5.0</b>

### M.Sc. Mathematics and Statistics with Specialization in Bioinformatics (4.5 credits)

<b>Requirements:</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
BIOL 5515 [0.5]	Bioinformatics	
BIOL 5517 [0.5]	Bioinformatics Seminar	
<b>2. 1.5 credits in coursework</b>		<b>1.5</b>
<b>3. 2.0 credits in:</b>		<b>2.0</b>
MATH 5909 [2.0]	M.Sc. Thesis in Mathematics (on an approved bioinformatics topic)	
<b>Total Credits</b>		<b>4.5</b>

1. Students must receive approval for course selection from their supervisor before registering in courses.
2. All master's students should normally participate in a seminar or research talks under the guidance of their supervisors.

### Bioinformatics-Related Courses

#### Biology

BIOL 5105 (BIO 5302)	Methods in Molecular Genetics
BIOL 5201 (BIO 8301)	Evolutionary Bioinformatics
BIOL 5409 (BIO 5306)	Modelling for Biologists
BIOL 5501 (BIO 8120)	Directed Studies in Biology
BIOL 5502 (BIO 8102)	Selected Topics in Biology
BIOL 5516 (BNF 5107)	Applied Bioinformatics

#### Biomedical Engineering

BIOM 5405 (BMG 5305)	Pattern Classification and Experiment Design
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#### Computer Science

COMP 5306 (CSI 5100)	Data Integration
COMP 5307 (CSI 5101)	Knowledge Representation
COMP 5704 (CSI 5131)	Parallel Algorithms and Applications in Data Science
COMP 5703 (CSI 5163)	Algorithm Analysis and Design
COMP 5108 (CSI 5126)	Algorithms in Bioinformatics

### Mathematics and Statistics

STAT 5708 (MAT 5170)	Probability Theory I
STAT 5709 (MAT 5171)	Probability Theory II
STAT 5703 (MAT 5181)	Data Mining
STAT 5702 (MAT 5182)	Modern Applied and Computational Statistics
STAT 5600 (MAT 5190)	Mathematical Statistics I
STAT 5501 (MAT 5191)	Mathematical Statistics II
MATH 6507 (MAT 5319)	Topics in Probability

### Systems and Computer Engineering

SYSC 5104 (ELG 6114)	Methodologies For Discrete-Event Modeling And Simulation
SYSC 5703 (ELG 6173)	Integrated Database and Cloud Systems

### Regulations

See the General Regulations section of this Calendar, and the regulations pertaining to the participating units offering this specialization.

### Admission

Admission to the collaborative program in Bioinformatics is available to students who are admitted in one of the participating programs. To apply to one of the participating programs, please visit the Graduate Studies Admissions page.

## Biology

This section presents the requirements for programs in:

- **M.Sc. Biology with Collaborative Specialization in Biochemistry**
- **M.Sc. Biology with Collaborative Specialization in Bioinformatics**
- **M.Sc. Biology with Collaborative Specialization in Chemical and Environmental Toxicology**
- **M.Sc. Biology with Collaborative Specialization in Data Science**
- **Ph.D. Biology**
- **Ph.D. Biology with Collaborative Specialization in Biochemistry**
- **Ph.D. Biology with Collaborative Specialization in Chemical and Environmental Toxicology**

### Program Requirements

M.Sc. Biology (5.0 credits)

#### Requirements:

1. 1.0 credit in approved coursework	1.0
2. 0.5 credit in:	0.5
BIOL 5000 [0.5] Introduction to Graduate Studies	
3. 3.5 credits in:	3.5
BIOL 5909 [3.5] M.Sc. Thesis (including successful oral defence)	
<b>Total Credits</b>	<b>5.0</b>

### M.Sc. Biology with Collaborative Specialization in Biochemistry (5.0 credits)

#### Requirements:

1. 1.0 credits in:	1.0
BIOL 5002 [0.5] Seminar in Biochemistry	
BIOL 5004 [0.5] Advances in Applied Biochemistry	
4. 4.0 credits in:	4.0
BIOL 5909 [3.5] M.Sc. Thesis (in the specialization, including successful oral defence)	
<b>Total Credits</b>	<b>5.0</b>

### M.Sc. Biology with Collaborative Specialization in Bioinformatics (5.0 credits)

#### Requirements:

1. 1.0 credit in:	1.0
BIOL 5515 [0.5] Bioinformatics	
BIOL 5517 [0.5] Bioinformatics Seminar	
2. 4.0 credits in:	4.0
BIOL 5909 [3.5] M.Sc. Thesis (in the specialization, including successful oral defence)	
<b>Total Credits</b>	<b>5.0</b>

### Bioinformatics-Related Courses

#### Biology

BIOL 5105 (BIO 5302) Methods in Molecular Genetics  
 BIOL 5201 (BIO 8301) Evolutionary Bioinformatics  
 BIOL 5409 (BIO 5306) Modelling for Biologists

BIOL 5501 (BIO 8120) Directed Studies in Biology  
 BIOL 5502 (BIO 8102) Selected Topics in Biology  
 BIOL 5516 (BNF 5107) Applied Bioinformatics

### Biomedical Engineering

BIOM 5405 (BMG 5305) Pattern Classification and Experiment Design

### Computer Science

COMP 5306 (CSI 5100) Data Integration  
 COMP 5307 (CSI 5101) Knowledge Representation  
 COMP 5704 (CSI 5131) Parallel Algorithms and Applications in Data Science  
 COMP 5703 (CSI 5163) Algorithm Analysis and Design  
 COMP 5108 (CSI 5126) Algorithms in Bioinformatics

### Mathematics and Statistics

STAT 5708 (MAT 5170) Probability Theory I  
 STAT 5709 (MAT 5171) Probability Theory II  
 STAT 5703 (MAT 5181) Data Mining  
 STAT 5702 (MAT 5182) Modern Applied and Computational Statistics  
 STAT 5600 (MAT 5190) Mathematical Statistics I  
 STAT 5501 (MAT 5191) Mathematical Statistics II  
 MATH 6507 (MAT 5319) Topics in Probability

### Systems and Computer Engineering

SYSC 5104 (ELG 6114) Methodologies For Discrete-Event Modeling And Simulation  
 SYSC 5703 (ELG 6173) Integrated Database and Cloud Systems

### M.Sc. Biology

### with Collaborative Specialization in Chemical and Environmental Toxicology (5.0 credits)

#### Requirements:

1. 1.5 credits in:	1.5
BIOL 6405/ CHEM 5805 [0.5] Seminar in Toxicology	
BIOL 6402/ CHEM 5705 [0.5] Principles of Toxicology	
or BIOL 6403/ CHEM 5708 [0.5] Ecotoxicology	
and 0.5 credit in additional approved coursework	
2. 3.5 credits in:	3.5
BIOL 5909 [3.5] M.Sc. Thesis (in the specialization, including successful oral defence)	

**Total Credits** **5.0**

## M.Sc. Biology with Collaborative Specialization in Data Science (5.0 credits)

### Requirements:

1. 0.5 credit in approved coursework	0.5
2. 0.5 credit in:	0.5
DATA 5000 [0.5]	Introduction to Data Science
3. 4.0 credits in:	4.0
BIOL 5909 [3.5]	M.Sc. Thesis (in the specialization, including successful oral defence)
<b>Total Credits</b>	<b>5.0</b>

### Note:

- Completion of the graduate courses specified by the student's advisory committee and the director or associate director of the OCIB is required. These are normally two one-term courses, but additional courses may be required, depending on the background and research program of the student.
- The passing grade for all required courses is 70% or the equivalent, and the student is not allowed a supplemental examination.
- The admissions committee or the student's advisory committee may also direct the student to take or to audit additional courses. Knowledge of a second language may be specified as a requirement.
- Completion of at least two terms as a full-time student resident at one of the two universities is normally required. Programs for part-time students may be arranged.
- Presentation of one public seminar on the candidate's thesis research is required.
- Completion of a thesis incorporating the results of original research carried out under the direct supervision of an approved faculty member is required.
- Successful oral defence of the thesis before an examination board of at least four faculty members, normally drawn from both universities, is required.

## Ph.D. Biology (1.0 credit)

### Requirements:

1. 1.0 credit in approved coursework	1.0
2. 0.5 credit in:	0.5
BIOL 5000 [0.5]	Introduction to Graduate Studies
3. 0.0 credits in:	0.0
BIOL 6909 [0.0]	Ph.D. Thesis (including successful oral defence)
<b>Total Credits</b>	<b>1.5</b>

## Ph.D. Biology with Collaborative Specialization in Biochemistry (1.0 credit)

### Requirements:

1. 1.0 credit in:	1.0
BIOL 5002 [0.5]	Seminar in Biochemistry
BIOL 5004 [0.5]	Advances in Applied Biochemistry
or, for students who have already completed BIOL 5002 and/or BIOL 5004, select from the following:	

BIOL 5105 [0.5]	Methods in Molecular Genetics
BIOL 5106 [0.5]	Laboratory Techniques in Molecular Genetics
BIOL 5502 [0.5]	Selected Topics in Biology
3. 0.0 credits in:	0.0
BIOL 6909 [0.0]	Ph.D. Thesis (in the specialization, including successful oral defence)
<b>Total Credits</b>	<b>1.0</b>

## Ph.D. Biology with Collaborative Specialization in Chemical and Environmental Toxicology (1.5 credits)

### Requirements:

1. 1.0 credit in:	1.0
BIOL 6405/ CHEM 5805 [0.5]	Seminar in Toxicology
BIOL 6402/ CHEM 5708 [0.5] or BIOL 6403 [0.5] Ecotoxicology or CHEM 5705 [0.5] Ecotoxicology	Principles of Toxicology
2. 0.5 credit in additional course work	0.5
2. 0.0 credits in:	0.0
BIOL 6909 [0.0]	Ph.D. Thesis (in the specialization, including successful oral defence)
<b>Total Credits</b>	<b>1.5</b>

### Note:

- Completion of the graduate courses specified by the student's advisory committee and the director or associate director of the OCIB is required. These will normally be two one-term courses (four one-term courses if transferred to the Ph.D. program without completing the M.Sc.).
- Only graduate courses may form part of the candidate's course requirements.
- The passing grade for all required courses is 70%, and the student is not allowed a supplemental examination.
- The admissions committee or the student's advisory committee may also direct the student to take or to audit additional courses. Knowledge of a second language may be specified as a requirement.
- Scheduling of an oral Qualifying Examination within approximately 12 months of entry into the program and completion normally within 18 months is required; this examination will cover the candidate's area of research, and related topics. The format of the examination will be established by the departmental graduate committee. The examination committee generally will be composed of faculty members of both universities.
- Presentation of at least one public seminar on the candidate's thesis research is required.
- A thesis incorporating the results of original research carried out under the direct supervision of an approved faculty member is required.
- Completion of at least four terms as a full-time student resident at one of the two universities (or six terms if transferred from an M.Sc.) is required. Under

exceptional conditions programs may be arranged for part-time students.

- Successful oral defence of the thesis is required before an examination board of at least five faculty members is required, with representation from both universities, and including an external examiner from outside the two universities who is an authority on the thesis research area.

## Regulations

See the General Regulations section of this Calendar.

### Guidelines for Completion of Master's Degree

The maximum time limits for the completion of the requirements of the master's program are listed in the General Regulations, Section 13 of this Calendar.

Full-time candidates in the master's program are expected to complete their degree requirements within six terms of first registration for full-time study.

Part-time candidates in the master's program are expected to complete their degree requirements within four calendar years or twelve terms from the initial registration in the master's program.

## Regulations

See the General Regulations section of this Calendar.

### Guidelines for Completion of the Doctoral Degree

The maximum time limits for the completion of the program requirements of the doctoral program are listed in the General Regulations, Section 13 of this Calendar.

Full-time candidates in the doctoral program are expected to schedule their oral Qualifying Examination within approximately 12 months of entry into the program, and to complete it within 18 months of entry into the program.

Part-time candidates in the doctoral program are expected to schedule their oral Qualifying Examination within approximately 18 months after entry into the program.

Full-time candidates are expected to complete their degree requirements within four (4) calendar years or 12 terms of registered full-time study.

Doctoral candidates who have transferred from the master's to the doctoral program without completing the master's program are expected to complete their degree requirements within four (4) calendar years or 12 terms of registered full-time study from initial registration in the master's program.

Part-time candidates in the doctoral program are expected to complete their degree requirements within six (6) calendar years or 18 terms after the date of initial registration.

## Admission

### M.Sc. Biology

An Honours B.Sc. or equivalent degree at a standard acceptable to the two universities is required for admission to the M.Sc. program.

Applicants with acceptable standing in a non-honours degree may be admitted to a qualifying-year program

which will be determined in each case by the admissions committee.

Applicants must demonstrate a fluent knowledge of English (Carleton), or either English or French (Ottawa).

### M. Biotechnology

Bachelor of Science (or equivalent) in a life sciences field, with B+ or higher in major subjects and B- or higher overall.

### Ph.D. Biology

An M.Sc. from a recognized university is required for entry to the Ph.D. program.

A student already registered for the M.Sc. may be permitted to transfer to the Ph.D. program following a recommendation by the departmental graduate committee and successful completion of the Qualifying Examination required of Ph.D. candidates.

All applicants must demonstrate a fluent knowledge of English (Carleton), or either English or French (Ottawa).

## Biology (BIOL) Courses

### BIOL 5000 [0.5 credit]

#### Introduction to Graduate Studies

This course will provide students with hands-on experience to develop skills that will contribute to a successful graduate experience. Topics/activities will include program expectations, proposal development, mentorship and teaching, scholarship and networking opportunities, and science communication (oral and written).

Includes: Experiential Learning Activity

Prerequisite(s): Admission to graduate program (MSc or PhD) in Biology at Carleton.

### BIOL 5001 [0.5 credit] (BIO 5101)

#### Topics in Biotechnology

A course concerned with the use of biological substances and activities of cells, genes, and enzymes in manufacturing, agricultural, and service industries. A different topic will be selected each year.

Includes: Experiential Learning Activity

Prerequisite(s): a course in cell physiology or biochemistry, or permission of the instructor and permission of the director or associate director of OCIB.

### BIOL 5002 [0.5 credit] (BIO 5107)

#### Seminar in Biochemistry

A graduate seminar on current topics in the field of Biochemistry. This course introduces the seminar format and involves student, faculty and invited seminar speakers. The student will present a seminar and submit a report on a current topic in Biochemistry.

Includes: Experiential Learning Activity

Also listed as CHEM 5800.

**BIOL 5004 [0.5 credit] (BIO 5104)**  
**Advances in Applied Biochemistry**

A practical hands-on course in the field of Biochemistry. This course is run in a laboratory and will train students in highly specialized technique(s) in Biochemistry. The students will run experiments, gather data, assess and analyze the results and present the findings as a seminar. Includes: Experiential Learning Activity  
Also listed as CHEM 5806.

**BIOL 5104 [0.5 credit] (BNF 5104)**  
**Bioinformatics Laboratory**

Principles of organization, retrieval, manipulation, and analysis of molecular data in genomics, proteomics and transcriptomics. Hands-on analysis of these data to solve biological questions using quantitative and computational methods.  
Includes: Experiential Learning Activity

**BIOL 5105 [0.5 credit] (BIO 5302)**  
**Methods in Molecular Genetics**

Theory and associated applications of emerging methods in molecular genetics, including information gathered from large-scale genome-wide analysis and protein-protein interaction data, and how this information can advance understanding of cell biology.  
Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5106 [0.5 credit] (BIO 5308)**  
**Laboratory Techniques in Molecular Genetics**

Laboratory course designed to give students practical experience in recent important techniques in molecular genetics.  
Includes: Experiential Learning Activity  
Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5111 [0.5 credit] (BIO 5111)**  
**Biophysical Techniques**

Theory and application of current biochemical/biophysical instrumentation and techniques including X-ray crystallography, nuclear magnetic resonance spectrometry, infrared, circular dichroism and fluorescence spectroscopy, and isothermal titration and differential scanning calorimetry.  
Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5128 [0.5 credit] (BIO 5128)**  
**Molecular Methods**

An intensive two-week laboratory course where students are introduced to methods such as CRISPR-Cas9 genome editing, in situ hybridization, immunohistochemistry, qRT-PCR and digital droplet PCR.  
Includes: Experiential Learning Activity

**BIOL 5144 [0.5 credit] (BIO 5144)**  
**Plant Molecular Biology**

Introduction to plant gene structure and function, cloning into plants and the manipulation of plant genes. Elements of plant biochemistry, physiology and molecular biology combined with an emphasis on practical research.

**BIOL 5158 [0.5 credit] (BIO 5158)**  
**Applied Biostatistics**

Applied biostatistics to real problems. Experimental design and data collection. Consequences of violating assumptions of different tests. Monte Carlo and Bootstrap analysis. Case studies and exercises in using statistical analysis packages.  
Includes: Experiential Learning Activity

**BIOL 5201 [0.5 credit] (BNF 8301)**  
**Evolutionary Bioinformatics**

Basic concepts in molecular evolution and hands-on experience with the computer analysis of DNA sequences. Topics may include molecular sequence databases, multiple alignments and phylogenetic trees.  
Includes: Experiential Learning Activity  
Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5203 [0.5 credit] (BIO 8303)**  
**Advanced Microscopy**

Development of the practical skills of microscopy through original research and supporting theory lectures.  
Includes: Experiential Learning Activity  
Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5300 [0.5 credit] (BIO 5130)**  
**Ethnobotany and Ethnopharmacology**

Introduction and current perspectives on world ethnobotanies, traditional knowledge, medicinal and food systems; quantitative and qualitative methods; ethical requirements; pharmacological basis of traditional drugs, phytochemistry, drug discovery and development; safety, risk assessment and regulations.

**BIOL 5304 [1.0 credit]**  
**Fundamentals in Neuroscience**

A comprehensive neuroscience course from cellular levels to neural systems and behaviour. Topics covered include aspects of neuroanatomy, neurophysiology, neuropharmacology and behavioural and cognitive neuroscience.  
Also listed as NEUR 5100.  
Precludes additional credit for PSYC 5200.

**BIOL 5307 [0.5 credit] (BIO 8122)****Advanced Insect Biology**

Overview of the biological processes that allow insects to function in their environments and to overcome the constraints and limitations that the environment places on them.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5313 [0.5 credit] (BIO 5313)****Topics in Evolutionary and Comparative Biology**

Workshop and hands-on training to develop broad basis and familiarity with the research toolkit of modern biology. Topics include the use of statistical programs, 3D data acquisition and analysis, cladistic analysis and phylogenetic comparative method, microscopy and histology, basic bioinformatics, , and scientific illustration.

**BIOL 5402 [0.5 credit] (BIO 8162)****Advanced Endocrinology**

Major topics in comparative endocrinology: understanding the structure, function and evolution of vertebrate endocrine systems, including endocrine disruption.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5404 [0.5 credit] (BIO 5109)****Biological Data Science in R**

Develops the practical skills needed to work with large and complex datasets, as a complement to statistical methods. Topics include programming, quality control, tidy data, visualization, project organization, reproducibility, how to troubleshoot code, and how to translate research goals into a project pipeline.

Includes: Experiential Learning Activity

Prerequisite(s): a course in statistics at the undergraduate level, or permission of the director or associate director of OCIB.

**BIOL 5407 [0.5 credit] (BIO 5305)****Biostatistics I**

Application of statistical analyses to biological data. Topics include ANOVA, regression, GLMs, and may include loglinear models, logistic regression, general additive models, mixed models, bootstrap and permutation tests.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5408 [0.5 credit] (BIO 5108)****Bayesian Statistics for Biologists**

Introduction to the philosophy of Bayesian inference; practical experience applying to biological data. Model formulation, identification of appropriate priors and resulting posteriors given priors and data, and the practice of drawing inferences from these posteriors.

Includes: Experiential Learning Activity

Prerequisite(s): An advanced course in applied biostatistics (e.g. BIOL 5407) or permission of the Department and good standing in a Carleton University Biology or Biochemistry Graduate Program.

**BIOL 5409 [0.5 credit] (BIO 5306)****Modelling for Biologists**

Use and limitations of mathematical and simulation modelling approaches for the study of biological phenomena.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5501 [0.5 credit] (BIO 8120)****Directed Studies in Biology**

One-to-one instruction in selected aspects of specialized biological subjects not covered by other graduate courses. Students may not take this course from their thesis supervisor(s), and are limited to one directed studies course per program.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5502 [0.5 credit] (BIO 8102)****Selected Topics in Biology**

Lecture and seminar courses in selected aspects of specialized biological subjects not covered by other graduate courses.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5506 [0.5 credit] (BIO 5213)****Principles and Methods of Biological Systematics**

Biological systematics with reference to morphological and molecular character evolution and phylogeny reconstruction.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5510 [0.5 credit] (BIO 5310)****Advanced Evolutionary Biology**

Advances in micro- and macroevolution including the mechanisms both driving and constraining evolutionary change, phylogenetic relationships, patterns of evolutionary change at the molecular or phenotypic level, and evolutionary theory and techniques as applied to these areas.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5511 [0.5 credit] (BIO 5311)****Advanced Evolutionary Ecology**

The ecological causes and consequences of evolutionary change, focussing on how the ecological interactions among organisms and their biotic and abiotic environments shape the evolution of phenotypic and species diversity.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5512 [0.5 credit] (BIO 8105)****Advances in Applied Ecology**

The application of ecological and evolutionary principles in addressing resource management challenges and environmental problems.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5514 [0.5 credit] (BIO 5314)****Advances in Aquatic Sciences**

Advanced theoretical and applied aquatic sciences including current topics in limnology and oceanography (e.g. impacts of climate change, invasive species, atmospheric pollution) with implications for lake, river, coastal and wetland management.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5515 [0.5 credit] (BNF 5106)****Bioinformatics**

Major concepts and methods of bioinformatics. Topics may include genetics, statistics and probability theory, alignments, phylogenetics, genomics, data mining, protein structure, cell simulation and computing.

Includes: Experiential Learning Activity

**BIOL 5516 [0.5 credit] (BNF 5107)****Applied Bioinformatics**

Introduction to programming for students in the life sciences. Through lectures, assignments, and independent projects, students will learn about basic concepts and techniques in programming, including variables, control structures, subroutines, and input/output. No previous knowledge of bioinformatics or programming is required.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of Ottawa-Carleton Institute for Biology.

**BIOL 5517 [0.5 credit] (BNF 6100)****Bioinformatics Seminar**

Current topics in bioinformatics. Students must successfully complete a presentation and written report.

**BIOL 5518 [0.5 credit] (BNF 5318)****Biostatistics II**

Application of multivariate methods to biological data, including methods such as discriminant functions analysis, cluster analysis, MANOVA, principle components analysis.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5520 [0.5 credit] (BIO 5320)****Advances in Conservation Science**

Interdisciplinary exploration of the science of scarcity and diversity in a human dominated world.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5526 [0.5 credit] (BIO 5126)****Analysis of Next-generation Sequence Data**

Assembly and analysis of next-generation sequence (NGS) data. Through hands-on exercises and independent projects, students will learn to use tools for quality control, assembly, mutation calling, and other NGS applications. No previous knowledge of bioinformatics or programming is required.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Director or Associate Director of OCIB.

**BIOL 5605 [0.5 credit] (BIO 5102)****Advanced Field Ecology**

Field experience in a new environment (e.g., local, national, international) to learn about ecological processes (note - extra fees associated with course).

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5709 [0.5 credit] (TOX 8157)****Chemical Toxicology**

An introduction to modeling chemical hazards and exposures at the cellular level. The properties of toxic substances are compared to the responses of enzymatic systems. These interactions are defined as Quantitative Structure-Activity Relationships and used to interpret hazardous materials under regulations such as WHMIS. Also listed as CHEM 5709/CHM 8157.

Prerequisite(s): BIOL 6402/CHEM 5708 (TOX 9156/CHM 8156), and permission of the director or associate director of OCIB.

**BIOL 5801 [0.5 credit] (BIO 5105)****Advanced Neuroethology**

A comparative and evolutionary approach to studying neural mechanisms underlying animal behaviour, including genetic, neural and hormonal influences on behaviour. Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5802 [0.5 credit] (BIO 8365)****Advanced Behavioural Ecology**

Recent advances in behavioural ecology including topics such as the evolution of tactics and strategies of group living, foraging, anti-predation, resource use and defence, cooperation, reproduction, and parental care.

Prerequisite(s): Either BIOL 3802 or BIOL 3804 or equivalent AND permission of the director or associate director of OCIB.

**BIOL 5900 [1.0 credit]****Problems and Opportunities in Biotechnology**

Identification of problems, solutions and opportunities in regional biotechnology industries. Lectures and workshops explore challenges of regional startup and established biotechnology companies.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department and good standing in a Carleton University biology or biochemistry graduate program.

**BIOL 5901 [1.0 credit]****Development of a Novel Biotechnology Product**

Capstone course. Under faculty supervision, students will either design and develop a start-up venture in their area of interest, or carry out an internship with a regional biotechnology company. Theory of business and entrepreneurship will be reinforced throughout. Graded SAT/UNS.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department and good standing in a Carleton University biology or biochemistry graduate program.

**BIOL 5909 [3.5 credits]****M.Sc. Thesis**

Includes: Experiential Learning Activity

**BIOL 6001 [0.5 credit] (BIO 8109)****Advanced Molecular Biology**

In-depth coverage of the structure, function, and synthesis of DNA, RNA, and proteins.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6002 [0.5 credit] (BIO 8116)****Advances in Plant Molecular Biology**

Use of molecular genetics in general plant biology and the contribution of plant genomics to our understanding of plant metabolism, plant development, and plant interactions with the environment at the molecular, genome, and cellular levels.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6040 [0.5 credit] (BIO 8940)****Advanced Statistics and Open Science**

The course aims to provide an understanding of advanced statistical models (including generalized linear mixed models), to develop good coding practices (using R and Rmarkdown), to improve data and code management (data manipulation and github) and present the principles of open science (using OSF).

Lectures

**BIOL 6115 [0.5 credit] (BIO 8115)****Genomics in Graduate Studies**

Applying tools of genomics in the current research environment. Students will build an original research proposal that includes genomics analyses distinct from those they currently use. The goal is to investigate how genomics (broadly defined) can help students tackle and/or uncover new questions in research.

**BIOL 6203 [0.5 credit] (BIO 6103)****Special Topics in Neuroscience**

In-depth study of current topics in neuroscience. Course content varies yearly and has recently included cognitive neuroscience, neuropharmacology, neurodegeneration, and behavioural medicine.

Also listed as NEUR 5800.

**BIOL 6204 [0.5 credit] (BIO 6304)****Techniques in Neuroscience**

Completion of a research project carried out under the supervision of a neuroscience faculty member, normally not the current supervisor. The student will learn a new neuroscience technique and apply it to a research objective. Students must obtain prior approval from the graduate committee.

Also listed as NEUR 6301, NEUR 6302.

Precludes additional credit for PSYC 6204.

**BIOL 6300 [0.5 credit] (BIO 8320)****Advanced Plant Biology**

Recent developments in plant biology. Topics may include plant anatomy, systematics, evolution, genetics, ecology, ethnobotany, cell biology, and/or biotechnology.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6304 [0.5 credit] (BIO 8361)****Advanced Animal Physiology**

Recent advances in animal physiology, emphasizing comparative, evolutionary and environmental approaches.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6305 [1.0 credit] (BIO 6305)****Advanced Seminar in Neuroscience**

A comprehensive pro-seminar series, covering issues ranging from cellular and molecular processes through to neural systems and behaviours as well as psychopathology. Students will also be required to attend the neuroscience colloquia series as part of this course.

Also listed as NEUR 6100.

Precludes additional credit for PSYC 6200, PSYC 6202, PSYC 6203.

Prerequisite(s): BIOL 5304 or equivalent.

**BIOL 6306 [0.5 credit]****Adv Seminar in Neuroscience II**

A comprehensive pro-seminar series, covering issues ranging from cellular and molecular processes through to neural systems and behaviours as well as psychopathology.

Prerequisite(s): BIOL 6305.

**BIOL 6402 [0.5 credit] (CHM 8156, TOX 8156)****Principles of Toxicology**

The basic theorems of toxicology with examples of current research problems. The concepts of exposure, hazard and risk assessment will be defined and illustrated with experimental material from some of the more dynamic areas of modern research.

Also listed as CHEM 5708.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6403 [0.5 credit] (CHM 9109, TOX 9104)****Ecotoxicology**

Selected topics and advances in ecotoxicology with emphasis on the biological effects of contaminants. The potential for biotic perturbation resulting from chronic and acute exposure of ecosystems to selected toxicants will be covered along with methods of pesticide, herbicide and pollutant residue analysis.

Also listed as CHEM 5705.

**BIOL 6404 [0.5 credit] (BIO 8938)****Plant: Animal Interactions**

The biology of co-evolutionary relationships between plants and phytophagous animals.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6405 [0.5 credit] (TOX 9105)****Seminar in Toxicology**

A seminar course highlighting current topics in toxicology. The student will present a seminar and submit a report on the seminar topic. Student, faculty and invited seminar speakers.

Includes: Experiential Learning Activity

Also listed as CHEM 5805.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6406 [0.5 credit] (BIO 9106)****Genetic Toxicology**

Topics in mutagenesis and DNA repair, including spontaneous and induced mutagenesis, genetic toxicology testing, the genetics and biochemistry of replication, DNA repair and recombination, and the role of mutagens in the development of genetic disease and cancer.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6500 [0.5 credit] (BIO 6300)**  
**Advanced Science Communication**

The theory and practice of effective science communication. Topics may include: writing for, presenting to, and engaging with diverse audiences, as well as graphic design and data visualization, social and digital media, and knowledge mobilization.  
Includes: Experiential Learning Activity

**BIOL 6505 [0.5 credit] (BIO 8108)**  
**Advanced Topics in Development**

Recent advances in developmental biology. Topics may include embryonic induction, regulation of morphogenesis and differentiation, mechanisms of regional specification and pattern formation, and developmental genetics. Offered in alternate years.  
Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6909 [0.0 credit]**

**Ph.D. Thesis**

Includes: Experiential Learning Activity

## Biomedical Engineering

This section presents the requirements for programs in:

- **M.A.Sc. Biomedical Engineering**
- **M.A.Sc. Biomedical Engineering with Collaborative Specialization in Accessibility**
- **M.A.Sc. Biomedical Engineering with Collaborative Specialization in Data Science**
- **M.A.Sc. Biomedical Engineering with Collaborative Specialization in Bioinformatics**
- **M.Eng. Biomedical Engineering**
- **M.Eng. Biomedical Engineering with Concentration in Clinical Engineering**
- **M.Eng. Biomedical Engineering with Collaborative Specialization in Accessibility**
- **M.Eng. Biomedical Engineering with Collaborative Specialization in Data Science**
- **Ph.D. Biomedical Engineering**

### Program Requirements

All master's students must successfully complete a total of 5.0 credits, which includes a 2.5 credit master's thesis. Courses must be selected with the approval of the student's supervisor.

#### M.A.Sc. Biomedical Engineering (5.0 credits)

**Requirements:**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
BIOM 5010 [0.5] Introduction to Biomedical Engineering	
<b>2. 1.0 credit in BIOM (BMG) courses</b>	<b>1.0</b>
<b>3. 1.0 credit in elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director</b>	<b>1.0</b>
<b>4. 2.5 credits in:</b>	<b>2.5</b>
BIOM 5909 [2.5] M.A.Sc. Thesis	
<b>5. 0.0 credit in:</b>	<b>0.0</b>
BIOM 5800 [0.0] Biomedical Engineering Seminar	
<b>Total Credits</b>	<b>5.0</b>

#### M.A.Sc. Biomedical Engineering with Collaborative Specialization in Accessibility (5.0 credits)

**Requirements - Thesis pathway:**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
BIOM 5010 [0.5] Introduction to Biomedical Engineering	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5] Critical Disability Studies	
ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar	
<b>3. 1.0 credit in BIOM(BMG) courses</b>	<b>1.0</b>
<b>4. 2.5 credits in:</b>	<b>2.5</b>
BIOM 5909 [2.5] M.A.Sc. Thesis (in the specialization)	
<b>5. 0.0 credit in:</b>	
BIOM 5800 [0.0] Biomedical Engineering Seminar	
<b>Total Credits</b>	<b>5.0</b>

## M.A.Sc. Biomedical Engineering with Collaborative Specialization in Data Science (5.0 credits)

### Requirements:

<b>1. 0.5 credit in:</b>	0.5
BIOM 5010 [0.5]	Introduction to Biomedical Engineering
<b>2. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>3. 1.0 credit in BIOM (BMG) courses</b>	1.0
<b>4. 0.5 credit in</b> elective courses taken either at Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	0.5
<b>5. 2.5 credits in:</b>	2.5
BIOM 5909 [2.5]	M.A.Sc. Thesis (in the specialization)
<b>6. 0.0 credit in:</b>	0.0
BIOM 5800 [0.0]	Biomedical Engineering Seminar
<b>Total Credits</b>	<b>5.0</b>

**Note:** for the course work **Item 3** and **Item 4** above, one 0.5 credit data science elective course must be taken (one of BIOM 5202, BIOM 5405, COMP 5100, COMP 5101, COMP 5107, COMP 5108, COMP 5111, COMP 5112, COMP 5204, COMP 5209, COMP 5305, COMP 5306, COMP 5307, COMP 5308, COMP 5401, COMP 5703, COMP 5704, PHYS 5002, SYSC 5001, SYSC 5004, SYSC 5101, SYSC 5103, SYSC 5108, SYSC 5201, SYSC 5207, SYSC 5303, SYSC 5304, SYSC 5401, SYSC 5405, SYSC 5407, SYSC 5500, SYSC 5703).

## M.A.Sc. Biomedical Engineering with Collaborative Specialization in Bioinformatics (5.0 credits)

Consult the Bioinformatics section for details regarding admission requirements to this program.

### Requirements - thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
BIOM 5010 [0.5]	Introduction to Biomedical Engineering
<b>2. 1.0 credit in:</b>	1.0
BIOL 5515 [0.5]	Bioinformatics
BIOL 5517 [0.5]	Bioinformatics Seminar
<b>3. 1.0 credit in BIOM (BMG) courses</b>	1.0
<b>4. 2.5 credits in:</b>	2.5
BIOM 5909 [2.5]	M.A.Sc. Thesis (in the specialization)
<b>5. 0.0 credit in:</b>	0.0
BIOM 5800 [0.0]	Biomedical Engineering Seminar
<b>Total Credits</b>	<b>5.0</b>

## M.Eng. Biomedical Engineering (5.0 credits)

### Requirements - by coursework

<b>1. 0.5 credit in:</b>	0.5
BIOM 5010 [0.5]	Introduction to Biomedical Engineering
<b>2. 2.0 credits in BIOM (BMG) courses</b>	2.0

**3. 2.5 credits in** elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director 2.5

### 4. 0.0 credit in:

BIOM 5800 [0.0]	Biomedical Engineering Seminar
<b>Total Credits</b>	<b>5.0</b>

### Requirements - by project

<b>1. 0.5 credit in:</b>	0.5
BIOM 5010 [0.5]	Introduction to Biomedical Engineering
<b>2. 1.5 credits in BIOM (BMG) courses</b>	1.5
<b>3. 1.5 credits in</b> elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	1.5
<b>4. 0.0 credit in:</b>	
BIOM 5800 [0.0]	Biomedical Engineering Seminar
<b>5. 1.5 credits in:</b>	1.5
BIOM 5900 [1.5]	Biomedical Engineering Project
<b>Total Credits</b>	<b>5.0</b>

## M.Eng. Biomedical Engineering with Concentration in Clinical Engineering (5.0 credits)

### Requirements:

<b>1. 2.5 credits in:</b>	2.5
BIOM 5010 [0.5]	Introduction to Biomedical Engineering
BIOM 5100 [0.5]	Biomedical Instrumentation
BIOM 5200 [0.5]	Medical Imaging Modalities
BIOM 5406 [0.5]	Clinical Engineering
HLTH 5201 [0.5]	Fundamentals of Policy I: Policy Analysis
<b>2. 0.0 credit in:</b>	
BIOM 5800 [0.0]	Biomedical Engineering Seminar
<b>3. 1.5 credit in:</b>	1.5
BIOM 5901 [1.5]	Clinical Engineering Project
<b>4. 1.0 credit in:</b>	1.0
BIOM 5801 [1.0]	Clinical Engineering Internship
<b>Total Credits</b>	<b>5.0</b>

## M.Eng. Biomedical Engineering with Collaborative Specialization in Accessibility (5.0 credits)

### Requirements - coursework pathway

<b>1. 0.5 credit in:</b>	0.5
BIOM 5010 [0.5]	Introduction to Biomedical Engineering
<b>2. 1.0 credit in:</b>	1.0
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>3. 2.0 credits in BIOM (BMG) courses</b>	2.0
<b>4. 0.5 credit in</b> the area of the specialization at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	0.5
<b>4. 1.0 credit in</b> elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	1.0
<b>5. 0.0 credit in:</b>	

BIOM 5800 [0.0]	Biomedical Engineering Seminar	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - by project:</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
BIOM 5010 [0.5]	Introduction to Biomedical Engineering	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>3. 1.5 credits in BIOM (BMG) courses</b>		<b>1.5</b>
<b>4. 0.5 credit in</b>	elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	<b>0.5</b>
<b>5. 0.0 credit in:</b>		
BIOM 5800 [0.0]	Biomedical Engineering Seminar	
<b>6. 1.5 credit in:</b>		<b>1.5</b>
BIOM 5900 [1.5]	Biomedical Engineering Project (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### M.Eng. Biomedical Engineering with Collaborative Specialization in Data Science (5.0 credits)

#### Requirements - by coursework:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
BIOM 5010 [0.5]	Introduction to Biomedical Engineering	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 2.0 credits in BIOM (BMG) courses</b>		<b>2.0</b>
<b>4. 2.0 credits in</b>	elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	<b>2.0</b>
<b>5. 0.0 credit in:</b>		
BIOM 5800 [0.0]	Biomedical Engineering Seminar	
<b>Total Credits</b>		<b>5.0</b>

**Note:** for the course work Item 3 and Item 4 above, three 0.5-credit data science elective courses must be taken (three of BIOM 5405, COMP 5100, COMP 5101, COMP 5107, COMP 5108, COMP 5111, COMP 5112, COMP 5204, COMP 5209, COMP 5305, COMP 5306, COMP 5307, COMP 5308, COMP 5401, COMP 5703, COMP 5704, PHYS 5002, SYSC 5001, SYSC 5004, SYSC 5101, SYSC 5103, SYSC 5108, SYSC 5201, SYSC 5207, SYSC 5303, SYSC 5306, SYSC 5401, SYSC 5405, SYSC 5407, SYSC 5500, SYSC 5703).

#### Requirements - by project:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
BIOM 5010 [0.5]	Introduction to Biomedical Engineering	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 1.5 credits in BIOM (BMG) courses</b>		<b>1.5</b>
<b>4. 1.0 credit in</b>	elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	<b>1.0</b>

<b>5. 0.0 credit in:</b>		
BIOM 5800 [0.0]	Biomedical Engineering Seminar	
<b>6. 1.5 credit in:</b>		<b>1.5</b>
BIOM 5900 [1.5]	Biomedical Engineering Project (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

**Note:** for the course work Item 3 and Item 4 above, three 0.5-credit data science elective courses must be taken (three of BIOM 5400, BIOM 5405, COMP 5100, COMP 5101, COMP 5107, COMP 5108, COMP 5111, COMP 5112, COMP 5204, COMP 5209, COMP 5305, COMP 5306, COMP 5307, COMP 5308, COMP 5401, COMP 5703, COMP 5704, PHYS 5002, SYSC 5001, SYSC 5003, SYSC 5004, SYSC 5007, SYSC 5101, SYSC 5102, SYSC 5103, SYSC 5108, SYSC 5201, SYSC 5207, SYSC 5300, SYSC 5303, SYSC 5306, SYSC 5401, SYSC 5404, SYSC 5405, SYSC 5407, SYSC 5500, SYSC 5703, SYSC 5706)

#### Notes:

- University of Ottawa course numbers are in parentheses.
- Course selection: only a selection of courses listed is given in a particular academic year. For information on courses offered in a given year please consult the Institute's web site ([www.ocibme.ca](http://www.ocibme.ca)).
- Given that the students admitted to this program are from different academic backgrounds, any elective course listed in this program can only be taken by qualified students who satisfy the prerequisites.

### Ph.D. Biomedical Engineering (1.5 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
BIOM 5010 [0.5]	Introduction to Biomedical Engineering	
<b>2. 0.5 credit in BIOM (BMG) courses</b>		<b>0.5</b>
<b>3. 0.5 credit in</b>	elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	<b>0.5</b>
<b>4. Completion of:</b>		<b>0.0</b>
BIOM 6800 [0.0]	Biomedical Engineering PhD Seminar	
<b>5. Successful completion of the comprehensive examination before the end of the fourth term of registration</b>		
<b>6. A written thesis proposal and oral examination to take place before the end of the sixth term of registration</b>		
<b>7. 0.0 credits in:</b>		<b>0.0</b>
BIOM 6909 [0.0]	Ph.D. Thesis	
<b>Total Credits</b>		<b>1.5</b>

#### Regulations

See the General Regulations section of this Calendar.

#### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the M.Eng. Biomedical Engineering (coursework and research project pathways only), including all concentrations and specializations, is considered a regularly scheduled break approved by the

University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## **Admission**

### **M.A.Sc. Biomedical Engineering**

The normal requirement for admission is a four-year bachelor's degree in engineering, science, computer science, or a related discipline, with an average of at least B+.

### **M.A.Sc. Biomedical Engineering Accelerated Pathway**

The accelerated pathway in the M.A.Sc. Biomedical Engineering is a flexible and individualized plan of graduate study. Students in their final year of a Carleton B.Eng. degree with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third-year of study in the B.Eng. degree should consult with both their Undergraduate Program Coordinator and the Associate Chair for Graduate Studies to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### **Accelerated Pathway Requirements**

1. At least 0.5 credit in a BIOM courses (5000 level or higher) with a grade of B+ or higher.
2. Minimal overall CGPA of A-.

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

## **Admission**

### **M.Eng. Biomedical Engineering**

The normal requirement for admission is a four-year bachelor's degree in engineering, science, computer science, biomedical sciences, health sciences, or a related discipline, with an average of at least B+. Applicants should note that simply meeting the minimum standards for admission will not guarantee admission to the program as there are only a limited number of positions available each year.

## **Admission**

### **Ph.D. Biomedical Engineering**

The normal requirement for admission into the Ph.D. program is a master's degree with thesis in engineering, science, computer science, or a related discipline, with an average of at least B+.

Students registered full-time in the M.A.Sc. in Biomedical Engineering program at Carleton University, who shows outstanding academic performance and demonstrates significant promise for advanced research, may be permitted to transfer into the doctoral program, without

completing the master's program, upon recommendation of the student's home academic unit.

## **Biomedical Engineering (BIOM) Courses**

### **BIOM 5010 [0.5 credit]**

#### **Introduction to Biomedical Engineering**

Research ethics and methods. Engineering systems approach to analysis and modelling of human anatomy and physiology. Introduction to topics including biomechanics, electrophysiology, and computational biology. Biomedical technologies. Impact of technology on society.

### **BIOM 5100 [0.5 credit] (BMG 5103)**

#### **Biomedical Instrumentation**

Instrumentation designed to measure physiological variables related to the function of the heart, lungs, kidney, nervous and musculo-skeletal system; emergency, critical care, surgery and anaesthesia equipment. Also listed as SYSC 5302 (ELG 6320). Prerequisite(s): permission of the instructor.

### **BIOM 5101 [0.5 credit] (BMG 5104)**

#### **Biological Signals**

Modeling of neuromuscular biological signals, including subthreshold phenomena, active behaviour of cell membranes, and innervation processes. Measurement of biological signals, including electrode effects. Time domain, frequency domain, and adaptive filtering techniques for noise reduction. Also listed as SYSC 5307 (ELG 6307).

### **BIOM 5106 [0.5 credit] (BMG 5109)**

#### **Advanced Topics in Medical Instrumentation**

Recent and advanced topics in the field of medical instrumentation and its related areas.

### **BIOM 5200 [0.5 credit] (BMG 5105)**

#### **Medical Imaging Modalities**

Mathematical models of image formation based on the image modality and tissue properties. Linear models of image degradation and reconstruction. Inverse problems, regularization for image reconstruction. Image formation in radiology, computed tomography, MRI, nuclear medicine, ultrasound, positron emission tomography. Also listed as SYSC 5304 (ELG 5127).

**BIOM 5201 [0.5 credit] (BMG 5106)****Introduction to Medical Imaging Principles and Technology**

Basic principles and technological implementation of x-ray, nuclear medicine, magnetic resonance imaging (MRI), and other imaging modalities used in medicine. Contrast, resolution, storage requirements for digital images. Applications outside medicine, future trends. Also listed as PHYS 5201.

Prerequisite(s): permission of the Physics department.

**BIOM 5202 [0.5 credit] (BMG 5107)****Applications in Biomedical Image Processing**

Image processing methods applied to biomedical images. Overview of medical imaging modalities. Image enhancement, segmentation, registration and fusion. Image quality metrics. Image formats. Application examples.

Includes: Experiential Learning Activity

Also listed as SYSC 5202.

**BIOM 5203 [0.5 credit] (BMG 5108)****Advanced Topics in Biomedical Image Processing**

Recent and advanced topics in the field of biomedical image processing and its related areas.

Prerequisite(s): permission of the instructor.

**BIOM 5300 [0.5 credit] (BMG 5300)****Biological and Engineering Materials**

Properties of structural biological materials (bone, tendon, ligament, skin, cartilage, muscle, and blood vessels) from an engineering materials viewpoint. Selection of engineering materials as biomaterials. Introduction to biocompatibility. Histology of soft tissues. Viscoelasticity, mechanical properties and models of muscles, ligaments and tendons.

Prerequisite(s): permission of the instructor.

**BIOM 5301 [0.5 credit] (BMG 5301)****Biomechanics of Skeletal System, Motion and Tissue**

Analysis of human motion. Kinematics and kinetics of various activities. Engineering analysis and modeling techniques applied to human motion. Injury mechanics, treatment, prosthetic replacements. Fracture behaviour and healing processes.

Prerequisite(s): permission of the instructor.

**BIOM 5302 [0.5 credit] (BMG 5302)****Biofluid Mechanics**

Properties of blood. Blood flow models for vessels, circulation systems and the heart. Artificial blood vessels. Kidney flow and exchange. Modeling of perfused tissues and cells. Transport phenomena across membranes. Molecular and ionic transport. Other body fluids.

Prerequisite(s): permission of the instructor.

**BIOM 5304 [0.5 credit] (BMG 5110)****Advanced Topics in Biomechanics and Biomaterials**

Recent and advanced topics in the field of biomechanics and biomaterials and its related areas.

**BIOM 5306 [0.5 credit] (BMG 5306)****Special Topics in Mechanical and Aerospace Engineering: Biomechanics**

Overview of human anatomy and physiology with emphasis on artificial organ and prosthetic device design requirement. Application of engineering principles to cells and tissues, biofluid mechanics, human body energetics, measurement techniques, mechanics of human body systems, with emphasis on the artificial heart.

**BIOM 5311 [0.5 credit] (BMG 5311)****Design of Medical Devices and Implants**

Solutions to clinical problems through the use of implants and medical devices. Pathology of organ failure and bioengineering and clinical aspects of artificial organs. Examples: blood substitutes, oxygenators, cardiac support, vascular substitutes, pacemakers, ventricular assist devices, artificial hearts and heart valves.

Prerequisite(s): permission of the instructor.

**BIOM 5312 [0.5 credit] (BMG 5312)****Design of Orthopaedic Implants and Prostheses**

Anatomy of the musculo-skeletal system. Electromyography. Static and dynamic analysis of the human skeleton. Materials and manufacturing considerations for orthopaedic devices. Strength and failure theories. Implant fatigue, fracture and corrosion.

Prerequisite(s): permission of the instructor.

**BIOM 5315 [0.5 credit] (BMG 5315)****Biorobotics**

Interpretation of physical laws as applied to human motion, kinematics and dynamics of humanoid robots, modeling of biological sensors and actuators, artificial muscles, tele-manipulation, robot assisted surgery, and multi-fingered end-effectors. Design of mechatronic devices including rehabilitators, extenders, haptic devices, and minimally invasive surgery systems.

Prerequisite(s): permission of the instructor.

**BIOM 5320 [0.5 credit] (BMG 5120)****Biomechanics of Movement**

Human and animal movement examined through the lens of mechanics. Biological, mechanical, and neurological processes by which muscles produce movement.

Experimental, mathematical, and computational tools.

Clinical and sports applications. Recent advances in biomedical research. Assignments, computer simulations, and a small research project.

Prerequisite(s): permission of the department.

**BIOM 5322 [0.5 credit] (BMG 5122)****Biomaterials and Tissue Engineering: Theories and Applications**

Principles of materials science and cell biology that apply to biomaterials and tissue engineering. Polymers, ceramics, metals, biomaterial surface modifications, molecular and cellular interactions with biomaterials, immune response, tissue engineering principles, ethical considerations and regulatory overview. Technical analysis of a biomaterial-based medical device.

**BIOM 5324 [0.5 credit] (BMG 5319)****Introduction to Microfluidics**

Physics of liquid transport in micro-fabricated systems including physics at the microscale, hydrodynamics of microfluidic systems, diffusion mixing, introduction to microfabrication, examples of microfluidics devices and Micro PIV techniques, project.

**BIOM 5330 [0.5 credit] (BMG 5330)****Electromagnetic Fields and Biological Systems**

Review of electromagnetic waves at radio and microwave frequencies. Electrical and magnetic properties of tissue.

Impact of electromagnetic waves on tissue. Cellular effects.

Prerequisite(s): permission of the instructor.

**BIOM 5402 [0.5 credit] (BMG 5304)****Interactive Networked Systems and Telemedicine**

Telemanipulator; human motoring and sensory capabilities; typical interface devices; mathematical model of haptic interfaces; haptic rendering; stability and transparency; remote control schemes; time delay compensation; networking and real-time protocols, history and challenges of telemedicine; telemedicine applications: telesurgery, tele-monitoring, tele-diagnosis and tele-homecare.

Also listed as SYSC 5303 (ELG 6133).

Prerequisite(s): permission of the instructor.

**BIOM 5403 [0.5 credit] (BMG 5111)****Advanced Topics in Medical Informatics and Telemedicine**

Recent and advanced topics in the field of medical informatics and telemedicine and its related areas.

**BIOM 5405 [0.5 credit] (BMG 5305)****Pattern Classification and Experiment Design**

Introduction to a variety of supervised and unsupervised pattern classification techniques with emphasis on correct application. Statistically rigorous experimental design and reporting of performance results. Case studies will be drawn from various fields including biomedical informatics.

Includes: Experiential Learning Activity

Also listed as SYSC 5405 (ELG 6102).

Prerequisite(s): undergraduate introductory probability and statistics.

**BIOM 5406 [0.5 credit]****Clinical Engineering**

Overview of the Canadian health care system; brief examples of other countries; clinical engineering and the management of technologies in industrialized and in developing countries; safety, reliability, quality assurance; introduction to biomedical sensor technologies; applications of telemedicine; impact of technology on health care.

Prerequisite(s): enrolment in M.Eng. Biomedical Engineering with Concentration in Clinical Engineering.

Also offered at the undergraduate level, with different requirements, as SYSC 4202, for which additional credit is precluded.

**BIOM 5409 [0.5 credit]****Advanced Data Visualization**

Fundamental concepts of information visualizations, including an introduction to visualization (importance, basic approaches, and existing tools), abstract visualization concepts, human perception, visualization methodology, interaction, design and development of interactive visualization systems, use of visualization software, tools, and techniques.

Includes: Experiential Learning Activity

Also listed as SYSC 5106.

Precludes additional credit for ITEC 5207.

Prerequisite(s): basic knowledge of programming.

**BIOM 5800 [0.0 credit] (BMG 6996)**  
**Biomedical Engineering Seminar**

This course is in the form of seminars presented by graduate students and other researchers in the area of Biomedical Engineering. To complete this course, a student must attend at least ten seminars and make one presentation in the context of this seminar series.  
Includes: Experiential Learning Activity

**BIOM 5801 [1.0 credit]**  
**Clinical Engineering Internship**

Internship placements are set in an institutional setting outside of the University. Students must complete a formal written paper in addition to their internship activities.  
Includes: Experiential Learning Activity

**BIOM 5900 [1.5 credit]**  
**Biomedical Engineering Project**

Students pursuing the project-based M.Eng. completion option conduct a biomedical engineering study, analysis, and/or design project under the supervision of a faculty member.  
Includes: Experiential Learning Activity

**BIOM 5901 [1.5 credit]**  
**Clinical Engineering Project**

Students pursuing the M.Eng. Clinical Engineering completion option conduct a clinical engineering study, analysis, and/or design project under the supervision of a faculty member.  
Includes: Experiential Learning Activity

**BIOM 5906 [0.5 credit] (BMG 7199)**  
**Directed Studies in Biomedical Engineering**

Various possibilities exist for pursuing directed studies on topics approved by a course supervisor, including the above-listed course topics where they are not offered on a formal basis.

**BIOM 5909 [2.5 credits]**  
**M.A.Sc. Thesis**

Includes: Experiential Learning Activity

**BIOM 6800 [0.0 credit]**  
**Biomedical Engineering PhD Seminar**

This course is in the form of seminars presented by graduate students and other researchers in the area of Biomedical Engineering.

**BIOM 6909 [0.0 credit]**  
**Ph.D. Thesis**

Includes: Experiential Learning Activity

## Biotechnology

This section presents the requirements for programs in:

• **Master of Biotechnology**

### Program Requirements

#### Master of Biotechnology (4.0 credits)

<b>1. 3.0 credits in:</b>	<b>3.0</b>
BIOL 5001 [0.5]	Topics in Biotechnology
BIOL 5900 [1.0]	Problems and Opportunities in Biotechnology
BIOL 5901 [1.0]	Development of a Novel Biotechnology Product
BIOL 6500 [0.5]	Advanced Science Communication
<b>2. 0.5 credit from:</b>	<b>0.5</b>
TIMG 5001 [0.5]	Principles of Technology Innovation Management
TIMG 5002 [0.5]	Technology Entrepreneurship
TIMG 5003 [0.5]	Issues in Technology Innovation Management
<b>3. 0.5 credit from:</b>	<b>0.5</b>
BIOL 5004 [0.5]	Advances in Applied Biochemistry
BIOL 5515 [0.5]	Bioinformatics
BIOL 5516 [0.5]	Applied Bioinformatics
BIOL 6402 [0.5]	Principles of Toxicology
CHEM 5109 [0.5]	Advanced Applications in Mass Spectrometry
FOOD 5102 [0.5]	Food Biotechnology
HLTH 5350 [0.5]	New Health Technologies
<b>Total Credits</b>	<b>4.0</b>

### Admission

#### M. Biotechnology

Bachelor of Science (or equivalent) in a life sciences field, with B+ or higher in major subjects and B- or higher overall.

### Regulations

See the General Regulations section of this Calendar.

### Biology (BIOL) Courses

#### BIOL 5000 [0.5 credit]

##### Introduction to Graduate Studies

This course will provide students with hands-on experience to develop skills that will contribute to a successful graduate experience. Topics/activities will include program expectations, proposal development, mentorship and teaching, scholarship and networking opportunities, and science communication (oral and written).

Includes: Experiential Learning Activity

Prerequisite(s): Admission to graduate program (MSc or PhD) in Biology at Carleton.

**BIOL 5001 [0.5 credit] (BIO 5101)****Topics in Biotechnology**

A course concerned with the use of biological substances and activities of cells, genes, and enzymes in manufacturing, agricultural, and service industries. A different topic will be selected each year.

Includes: Experiential Learning Activity

Prerequisite(s): a course in cell physiology or biochemistry, or permission of the instructor and permission of the director or associate director of OCIB.

**BIOL 5002 [0.5 credit] (BIO 5107)****Seminar in Biochemistry**

A graduate seminar on current topics in the field of Biochemistry. This course introduces the seminar format and involves student, faculty and invited seminar speakers. The student will present a seminar and submit a report on a current topic in Biochemistry.

Includes: Experiential Learning Activity

Also listed as CHEM 5800.

**BIOL 5004 [0.5 credit] (BIO 5104)****Advances in Applied Biochemistry**

A practical hands-on course in the field of Biochemistry. This course is run in a laboratory and will train students in highly specialized technique(s) in Biochemistry. The students will run experiments, gather data, assess and analyze the results and present the findings as a seminar.

Includes: Experiential Learning Activity

Also listed as CHEM 5806.

**BIOL 5104 [0.5 credit] (BNF 5104)****Bioinformatics Laboratory**

Principles of organization, retrieval, manipulation, and analysis of molecular data in genomics, proteomics and transcriptomics. Hands-on analysis of these data to solve biological questions using quantitative and computational methods.

Includes: Experiential Learning Activity

**BIOL 5105 [0.5 credit] (BIO 5302)****Methods in Molecular Genetics**

Theory and associated applications of emerging methods in molecular genetics, including information gathered from large-scale genome-wide analysis and protein-protein interaction data, and how this information can advance understanding of cell biology.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5106 [0.5 credit] (BIO 5308)****Laboratory Techniques in Molecular Genetics**

Laboratory course designed to give students practical experience in recent important techniques in molecular genetics.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5111 [0.5 credit] (BIO 5111)****Biophysical Techniques**

Theory and application of current biochemical/biophysical instrumentation and techniques including X-ray crystallography, nuclear magnetic resonance spectrometry, infrared, circular dichroism and fluorescence spectroscopy, and isothermal titration and differential scanning calorimetry.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5128 [0.5 credit] (BIO 5128)****Molecular Methods**

An intensive two-week laboratory course where students are introduced to methods such as CRISPR-Cas9 genome editing, in situ hybridization, immunohistochemistry, qRT-PCR and digital droplet PCR.

Includes: Experiential Learning Activity

**BIOL 5144 [0.5 credit] (BIO 5144)****Plant Molecular Biology**

Introduction to plant gene structure and function, cloning into plants and the manipulation of plant genes. Elements of plant biochemistry, physiology and molecular biology combined with an emphasis on practical research.

**BIOL 5158 [0.5 credit] (BIO 5158)****Applied Biostatistics**

Applied biostatistics to real problems. Experimental design and data collection. Consequences of violating assumptions of different tests. Monte Carlo and Bootstrap analysis. Case studies and exercises in using statistical analysis packages.

Includes: Experiential Learning Activity

**BIOL 5201 [0.5 credit] (BNF 8301)****Evolutionary Bioinformatics**

Basic concepts in molecular evolution and hands-on experience with the computer analysis of DNA sequences. Topics may include molecular sequence databases, multiple alignments and phylogenetic trees.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5203 [0.5 credit] (BIO 8303)****Advanced Microscopy**

Development of the practical skills of microscopy through original research and supporting theory lectures.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5300 [0.5 credit] (BIO 5130)****Ethnobotany and Ethnopharmacology**

Introduction and current perspectives on world ethnobotanies, traditional knowledge, medicinal and food systems; quantitative and qualitative methods; ethical requirements; pharmacological basis of traditional drugs, phytochemistry, drug discovery and development; safety, risk assessment and regulations.

**BIOL 5304 [1.0 credit]****Fundamentals in Neuroscience**

A comprehensive neuroscience course from cellular levels to neural systems and behaviour. Topics covered include aspects of neuroanatomy, neurophysiology, neuropharmacology and behavioural and cognitive neuroscience.

Also listed as NEUR 5100.

Precludes additional credit for PSYC 5200.

**BIOL 5307 [0.5 credit] (BIO 8122)****Advanced Insect Biology**

Overview of the biological processes that allow insects to function in their environments and to overcome the constraints and limitations that the environment places on them.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5313 [0.5 credit] (BIO 5313)****Topics in Evolutionary and Comparative Biology**

Workshop and hands-on training to develop broad basis and familiarity with the research toolkit of modern biology. Topics include the use of statistical programs, 3D data acquisition and analysis, cladistic analysis and phylogenetic comparative method, microscopy and histology, basic bioinformatics, , and scientific illustration.

**BIOL 5402 [0.5 credit] (BIO 8162)****Advanced Endocrinology**

Major topics in comparative endocrinology: understanding the structure, function and evolution of vertebrate endocrine systems, including endocrine disruption.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5404 [0.5 credit] (BIO 5109)****Biological Data Science in R**

Develops the practical skills needed to work with large and complex datasets, as a complement to statistical methods. Topics include programming, quality control, tidy data, visualization, project organization, reproducibility, how to troubleshoot code, and how to translate research goals into a project pipeline.

Includes: Experiential Learning Activity

Prerequisite(s): a course in statistics at the undergraduate level, or permission of the director or associate director of OCIB.

**BIOL 5407 [0.5 credit] (BIO 5305)****Biostatistics I**

Application of statistical analyses to biological data.

Topics include ANOVA, regression, GLMs, and may include loglinear models, logistic regression, general additive models, mixed models, bootstrap and permutation tests.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5408 [0.5 credit] (BIO 5108)****Bayesian Statistics for Biologists**

Introduction to the philosophy of Bayesian inference; practical experience applying to biological data. Model formulation, identification of appropriate priors and resulting posteriors given priors and data, and the practice of drawing inferences from these posteriors.

Includes: Experiential Learning Activity

Prerequisite(s): An advanced course in applied biostatistics (e.g. BIOL 5407) or permission of the Department and good standing in a Carleton University Biology or Biochemistry Graduate Program.

**BIOL 5409 [0.5 credit] (BIO 5306)****Modelling for Biologists**

Use and limitations of mathematical and simulation modelling approaches for the study of biological phenomena.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5501 [0.5 credit] (BIO 8120)****Directed Studies in Biology**

One-to-one instruction in selected aspects of specialized biological subjects not covered by other graduate courses. Students may not take this course from their thesis supervisor(s), and are limited to one directed studies course per program.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5502 [0.5 credit] (BIO 8102)****Selected Topics in Biology**

Lecture and seminar courses in selected aspects of specialized biological subjects not covered by other graduate courses.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5506 [0.5 credit] (BIO 5213)****Principles and Methods of Biological Systematics**

Biological systematics with reference to morphological and molecular character evolution and phylogeny reconstruction.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5510 [0.5 credit] (BIO 5310)****Advanced Evolutionary Biology**

Advances in micro- and macroevolution including the mechanisms both driving and constraining evolutionary change, phylogenetic relationships, patterns of evolutionary change at the molecular or phenotypic level, and evolutionary theory and techniques as applied to these areas.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5511 [0.5 credit] (BIO 5311)****Advanced Evolutionary Ecology**

The ecological causes and consequences of evolutionary change, focussing on how the ecological interactions among organisms and their biotic and abiotic environments shape the evolution of phenotypic and species diversity.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5512 [0.5 credit] (BIO 8105)****Advances in Applied Ecology**

The application of ecological and evolutionary principles in addressing resource management challenges and environmental problems.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5514 [0.5 credit] (BIO 5314)****Advances in Aquatic Sciences**

Advanced theoretical and applied aquatic sciences including current topics in limnology and oceanography (e.g. impacts of climate change, invasive species, atmospheric pollution) with implications for lake, river, coastal and wetland management.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5515 [0.5 credit] (BNF 5106)****Bioinformatics**

Major concepts and methods of bioinformatics. Topics may include genetics, statistics and probability theory, alignments, phylogenetics, genomics, data mining, protein structure, cell simulation and computing.

Includes: Experiential Learning Activity

**BIOL 5516 [0.5 credit] (BNF 5107)****Applied Bioinformatics**

Introduction to programming for students in the life sciences. Through lectures, assignments, and independent projects, students will learn about basic concepts and techniques in programming, including variables, control structures, subroutines, and input/output. No previous knowledge of bioinformatics or programming is required.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of Ottawa-Carleton Institute for Biology.

**BIOL 5517 [0.5 credit] (BNF 6100)****Bioinformatics Seminar**

Current topics in bioinformatics. Students must successfully complete a presentation and written report.

**BIOL 5518 [0.5 credit] (BNF 5318)****Biostatistics II**

Application of multivariate methods to biological data, including methods such as discriminant functions analysis, cluster analysis, MANOVA, principle components analysis.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5520 [0.5 credit] (BIO 5320)****Advances in Conservation Science**

Interdisciplinary exploration of the science of scarcity and diversity in a human dominated world.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5526 [0.5 credit] (BIO 5126)****Analysis of Next-generation Sequence Data**

Assembly and analysis of next-generation sequence (NGS) data. Through hands-on exercises and independent projects, students will learn to use tools for quality control, assembly, mutation calling, and other NGS applications. No previous knowledge of bioinformatics or programming is required.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Director or Associate Director of OCIB.

**BIOL 5605 [0.5 credit] (BIO 5102)****Advanced Field Ecology**

Field experience in a new environment (e.g., local, national, international) to learn about ecological processes (note - extra fees associated with course).

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5709 [0.5 credit] (TOX 8157)****Chemical Toxicology**

An introduction to modeling chemical hazards and exposures at the cellular level. The properties of toxic substances are compared to the responses of enzymatic systems. These interactions are defined as Quantitative Structure-Activity Relationships and used to interpret hazardous materials under regulations such as WHMIS.

Also listed as CHEM 5709/CHM 8157.

Prerequisite(s): BIOL 6402/CHEM 5708 (TOX 9156/CHM 8156), and permission of the director or associate director of OCIB.

**BIOL 5801 [0.5 credit] (BIO 5105)****Advanced Neuroethology**

A comparative and evolutionary approach to studying neural mechanisms underlying animal behaviour, including genetic, neural and hormonal influences on behaviour.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 5802 [0.5 credit] (BIO 8365)****Advanced Behavioural Ecology**

Recent advances in behavioural ecology including topics such as the evolution of tactics and strategies of group living, foraging, anti-predation, resource use and defence, cooperation, reproduction, and parental care.

Prerequisite(s): Either BIOL 3802 or BIOL 3804 or equivalent AND permission of the director or associate director of OCIB.

**BIOL 5900 [1.0 credit]****Problems and Opportunities in Biotechnology**

Identification of problems, solutions and opportunities in regional biotechnology industries. Lectures and workshops explore challenges of regional startup and established biotechnology companies.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department and good standing in a Carleton University biology or biochemistry graduate program.

**BIOL 5901 [1.0 credit]****Development of a Novel Biotechnology Product**

Capstone course. Under faculty supervision, students will either design and develop a start-up venture in their area of interest, or carry out an internship with a regional biotechnology company. Theory of business and entrepreneurship will be reinforced throughout. Graded SAT/UNS.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department and good standing in a Carleton University biology or biochemistry graduate program.

**BIOL 5909 [3.5 credits]****M.Sc. Thesis**

Includes: Experiential Learning Activity

**BIOL 6001 [0.5 credit] (BIO 8109)****Advanced Molecular Biology**

In-depth coverage of the structure, function, and synthesis of DNA, RNA, and proteins.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6002 [0.5 credit] (BIO 8116)****Advances in Plant Molecular Biology**

Use of molecular genetics in general plant biology and the contribution of plant genomics to our understanding of plant metabolism, plant development, and plant interactions with the environment at the molecular, genome, and cellular levels.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6040 [0.5 credit] (BIO 8940)****Advanced Statistics and Open Science**

The course aims to provide an understanding of advanced statistical models (including generalized linear mixed models), to develop good coding practices (using R and Rmarkdown), to improve data and code management (data manipulation and github) and present the principles of open science (using OSF).

Lectures

**BIOL 6115 [0.5 credit] (BIO 8115)****Genomics in Graduate Studies**

Applying tools of genomics in the current research environment. Students will build an original research proposal that includes genomics analyses distinct from those they currently use. The goal is to investigate how genomics (broadly defined) can help students tackle and/or uncover new questions in research.

**BIOL 6203 [0.5 credit] (BIO 6103)****Special Topics in Neuroscience**

In-depth study of current topics in neuroscience. Course content varies yearly and has recently included cognitive neuroscience, neuropharmacology, neurodegeneration, and behavioural medicine.

Also listed as NEUR 5800.

**BIOL 6204 [0.5 credit] (BIO 6304)****Techniques in Neuroscience**

Completion of a research project carried out under the supervision of a neuroscience faculty member, normally not the current supervisor. The student will learn a new neuroscience technique and apply it to a research objective. Students must obtain prior approval from the graduate committee.

Also listed as NEUR 6301, NEUR 6302.

Precludes additional credit for PSYC 6204.

**BIOL 6300 [0.5 credit] (BIO 8320)****Advanced Plant Biology**

Recent developments in plant biology. Topics may include plant anatomy, systematics, evolution, genetics, ecology, ethnobotany, cell biology, and/or biotechnology.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6304 [0.5 credit] (BIO 8361)****Advanced Animal Physiology**

Recent advances in animal physiology, emphasizing comparative, evolutionary and environmental approaches. Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6305 [1.0 credit] (BIO 6305)****Advanced Seminar in Neuroscience**

A comprehensive pro-seminar series, covering issues ranging from cellular and molecular processes through to neural systems and behaviours as well as psychopathology. Students will also be required to attend the neuroscience colloquia series as part of this course. Also listed as NEUR 6100.

Precludes additional credit for PSYC 6200, PSYC 6202, PSYC 6203.

Prerequisite(s): BIOL 5304 or equivalent.

**BIOL 6306 [0.5 credit]****Adv Seminar in Neuroscience II**

A comprehensive pro-seminar series, covering issues ranging from cellular and molecular processes through to neural systems and behaviours as well as psychopathology.

Prerequisite(s): BIOL 6305.

**BIOL 6402 [0.5 credit] (CHM 8156, TOX 8156)****Principles of Toxicology**

The basic theorems of toxicology with examples of current research problems. The concepts of exposure, hazard and risk assessment will be defined and illustrated with experimental material from some of the more dynamic areas of modern research.

Also listed as CHEM 5708.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6403 [0.5 credit] (CHM 9109, TOX 9104)****Ecotoxicology**

Selected topics and advances in ecotoxicology with emphasis on the biological effects of contaminants. The potential for biotic perturbation resulting from chronic and acute exposure of ecosystems to selected toxicants will be covered along with methods of pesticide, herbicide and pollutant residue analysis.

Also listed as CHEM 5705.

**BIOL 6404 [0.5 credit] (BIO 8938)****Plant: Animal Interactions**

The biology of co-evolutionary relationships between plants and phytophagous animals.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6405 [0.5 credit] (TOX 9105)****Seminar in Toxicology**

A seminar course highlighting current topics in toxicology. The student will present a seminar and submit a report on the seminar topic. Student, faculty and invited seminar speakers.

Includes: Experiential Learning Activity

Also listed as CHEM 5805.

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6406 [0.5 credit] (BIO 9106)****Genetic Toxicology**

Topics in mutagenesis and DNA repair, including spontaneous and induced mutagenesis, genetic toxicology testing, the genetics and biochemistry of replication, DNA repair and recombination, and the role of mutagens in the development of genetic disease and cancer.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6500 [0.5 credit] (BIO 6300)**  
**Advanced Science Communication**

The theory and practice of effective science communication. Topics may include: writing for, presenting to, and engaging with diverse audiences, as well as graphic design and data visualization, social and digital media, and knowledge mobilization.  
Includes: Experiential Learning Activity

**BIOL 6505 [0.5 credit] (BIO 8108)**  
**Advanced Topics in Development**

Recent advances in developmental biology. Topics may include embryonic induction, regulation of morphogenesis and differentiation, mechanisms of regional specification and pattern formation, and developmental genetics.  
Offered in alternate years.  
Prerequisite(s): permission of the director or associate director of OCIB.

**BIOL 6909 [0.0 credit]**  
**Ph.D. Thesis**

Includes: Experiential Learning Activity

## Building Engineering

This section presents the requirements for programs in:

- **M.A.Sc. Building Engineering**
- **M.A.Sc. Building Engineering with Concentration in Building Performance**
- **M.A.Sc. Building Engineering with Concentration in Fire Safety**
- **M.A.Sc. Building Engineering with Concentration in Heritage Conservation**
- **M.Eng. Building Engineering**
- **M.Eng. Building Engineering with Concentration in Building Performance**
- **M.Eng. Building Engineering with Concentration in Fire Safety**
- **M.Eng. Building Engineering with Concentration in Heritage Conservation**
- **Ph.D. Building Engineering**
- **Ph.D. Building Engineering with Concentration in Building Performance**
- **Ph.D. Building Engineering with Concentration in Fire Safety**
- **Ph.D. Building Engineering with Concentration in Heritage Conservation**

### Program Requirements

#### M.A.Sc. Building Engineering (5.0 credits)

**Requirements:**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
BLDG 5101 [0.5]	Introduction to Building Engineering
<b>2. 1.0 credit from</b> the following list. Other courses may be used, with Supervisor recommendation and Director approval.	<b>1.0</b>
ARCN 5100 [0.5]	Representation and Documentation in Architectural Conservation
ARCC 5401 [0.5]	Workshop: Technical Studies in Heritage Conservation
BLDG 5301 [0.5]	Building Energy Management and Optimization
BLDG 5302 [0.5]	Building Services Engineering
BLDG 5103 [0.5]	Research Methods for Building Engineering
CDNS 5403 [0.5]	Heritage Conservation and Sustainability
BLDG 5201 [0.5]	Advanced Building Characterization, Conservation and Rehabilitation
BLDG 5203 [0.5]	Advanced Computational Modeling Strategies of Historic Buildings
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering
CIVE 5610 [0.5]	Fire Dynamics I
BLDG 5202 [0.5]	Structural Assessment of Historic Buildings
CIVE 5612 [0.5]	Fire Modeling
CIVE 5613 [0.5]	Fire Dynamics II
CIVE 5614 [0.5]	Design for Fire Resistance
CIVE 5615 [0.5]	Fire Behaviour of Materials

MECH 5205 [0.5]	Building Performance Simulation	
<b>3. 1.0 credit in</b>	approved electives	1.0
<b>4. 2.5 credits in:</b>		2.5
BLDG 5909 [2.5]	M.A.Sc. Thesis (in the area of the concentration)	
<b>Total Credits</b>		<b>5.0</b>

### **M.A.Sc. Building Engineering with Concentration in Building Performance (5.0 credits)**

#### **Requirements:**

<b>1. 0.5 credit in:</b>		0.5
BLDG 5101 [0.5]	Introduction to Building Engineering	
<b>2. 1.5 credits in</b>	the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.	1.5
BLDG 5103 [0.5]	Research Methods for Building Engineering	
BLDG 5104 [0.5]	Indoor Environmental Quality	
BLDG 5301 [0.5]	Building Energy Management and Optimization	
BLDG 5302 [0.5]	Building Services Engineering	
MECH 5205 [0.5]	Building Performance Simulation	
<b>3. 0.5 credit in</b>	approved electives	0.5
<b>4. 2.5 credits in:</b>		2.5
BLDG 5909 [2.5]	M.A.Sc. Thesis (in the area of the concentration)	
<b>Total Credits</b>		<b>5.0</b>

### **M.A.Sc. Building Engineering with Concentration in Fire Safety (5.0 credits)**

#### **Requirements:**

<b>1. 0.5 credit in:</b>		0.5
BLDG 5101 [0.5]	Introduction to Building Engineering	
<b>2. 1.5 credits in</b>	the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.	1.5
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering	
CIVE 5610 [0.5]	Fire Dynamics I	
CIVE 5612 [0.5]	Fire Modeling	
CIVE 5613 [0.5]	Fire Dynamics II	
CIVE 5614 [0.5]	Design for Fire Resistance	
CIVE 5615 [0.5]	Fire Behaviour of Materials	
<b>3. 0.5 credit in</b>	approved electives	0.5
<b>4. 2.5 credits in:</b>		2.5
BLDG 5909 [2.5]	M.A.Sc. Thesis (in the area of the concentration)	
<b>Total Credits</b>		<b>5.0</b>

### **M.A.Sc. Building Engineering with Concentration in Heritage Conservation (5.0 credits)**

#### **Requirements:**

<b>1. 0.5 credit in:</b>		0.5
BLDG 5101 [0.5]	Introduction to Building Engineering	
<b>2. 1.5 credits in</b>	the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.	1.5

ARCN 5100 [0.5]	Representation and Documentation in Architectural Conservation	
ARCC 5401 [0.5]	Workshop: Technical Studies in Heritage Conservation	
CDNS 5403 [0.5]	Heritage Conservation and Sustainability	
BLDG 5201 [0.5]	Advanced Building Characterization, Conservation and Rehabilitation	
BLDG 5202 [0.5]	Structural Assessment of Historic Buildings	
BLDG 5203 [0.5]	Advanced Computational Modeling Strategies of Historic Buildings	
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering	
<b>3. 0.5 credit in</b>	approved electives	0.5
<b>4. 2.5 credits in:</b>		2.5
BLDG 5909 [2.5]	M.A.Sc. Thesis (in the area of the concentration)	
<b>Total Credits</b>		<b>5.0</b>

### **M.Eng. Building Engineering (5.0 credits)**

#### **Requirements - Coursework pathway:**

<b>1. 1.0 credit in:</b>		1.0
BLDG 5101 [0.5]	Introduction to Building Engineering	
BLDG 5103 [0.5]	Research Methods for Building Engineering	
<b>2. 0.5 credit from</b>	Building Performance concentration courses:	0.5
BLDG 5104 [0.5]	Indoor Environmental Quality	
BLDG 5301 [0.5]	Building Energy Management and Optimization	
BLDG 5302 [0.5]	Building Services Engineering	
MECH 5205 [0.5]	Building Performance Simulation	
<b>3. 0.5 credit from</b>	Fire Safety concentration courses:	0.5
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering	
CIVE 5610 [0.5]	Fire Dynamics I	
CIVE 5612 [0.5]	Fire Modeling	
CIVE 5613 [0.5]	Fire Dynamics II	
CIVE 5614 [0.5]	Design for Fire Resistance	
CIVE 5615 [0.5]	Fire Behaviour of Materials	
<b>4. 0.5 credit from</b>	Heritage Conservation concentration courses:	0.5
ARCN 5100 [0.5]	Representation and Documentation in Architectural Conservation	
ARCC 5401 [0.5]	Workshop: Technical Studies in Heritage Conservation	
BLDG 5201 [0.5]	Advanced Building Characterization, Conservation and Rehabilitation	
BLDG 5202 [0.5]	Structural Assessment of Historic Buildings	
BLDG 5203 [0.5]	Advanced Computational Modeling Strategies of Historic Buildings	
BLDG 5301 [0.5]	Building Energy Management and Optimization	
CDNS 5403 [0.5]	Heritage Conservation and Sustainability	
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering	

<b>5. 1.0 credit in</b> additional concentration courses, not already used to fulfil Items 2-4 above	1.0
<b>6. 1.5 credits in</b> approved electives	1.5
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Project pathway:

<b>1. 1.0 credit in:</b>	1.0
BLDG 5101 [0.5]	Introduction to Building Engineering
BLDG 5103 [0.5]	Research Methods for Building Engineering
<b>2. 2.0 credits from</b> the following list. Other courses may be used, with Supervisor recommendation and Director approval.	2.0
ARCN 5100 [0.5]	Representation and Documentation in Architectural Conservation
ARCC 5401 [0.5]	Workshop: Technical Studies in Heritage Conservation
CDNS 5403 [0.5]	Heritage Conservation and Sustainability
BLDG 5302 [0.5]	Building Services Engineering
BLDG 5104 [0.5]	Indoor Environmental Quality
BLDG 5201 [0.5]	Advanced Building Characterization, Conservation and Rehabilitation
BLDG 5202 [0.5]	Structural Assessment of Historic Buildings
BLDG 5203 [0.5]	Advanced Computational Modeling Strategies of Historic Buildings
BLDG 5301 [0.5]	Building Energy Management and Optimization
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering
CIVE 5610 [0.5]	Fire Dynamics I
CIVE 5612 [0.5]	Fire Modeling
CIVE 5613 [0.5]	Fire Dynamics II
CIVE 5614 [0.5]	Design for Fire Resistance
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering
MECH 5205 [0.5]	Building Performance Simulation
<b>3. 1.0 credits in</b> approved electives	1.0
<b>4. 1.0 credit in:</b>	1.0
BLDG 5900 [1.0]	M.Eng. Project
<b>Total Credits</b>	<b>5.0</b>

### M.Eng. Building Engineering with Concentration in Building Performance (5.0 credits)

#### Requirements - Coursework pathway:

<b>1. 1.0 credit in:</b>	1.0
BLDG 5101 [0.5]	Introduction to Building Engineering
BLDG 5103 [0.5]	Research Methods for Building Engineering
<b>2. 2.0 credits in</b> the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.	2.0
BLDG 5104 [0.5]	Indoor Environmental Quality
BLDG 5301 [0.5]	Building Energy Management and Optimization
BLDG 5302 [0.5]	Building Services Engineering
MECH 5205 [0.5]	Building Performance Simulation

<b>3. 2.0 credits in</b> approved electives	2.0
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<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Project pathway:

<b>1. 1.0 credit in:</b>	1.0
BLDG 5101 [0.5]	Introduction to Building Engineering
BLDG 5103 [0.5]	Research Methods for Building Engineering
<b>2. 2.0 credits in</b> the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.	2.0
BLDG 5104 [0.5]	Indoor Environmental Quality
BLDG 5301 [0.5]	Building Energy Management and Optimization
BLDG 5302 [0.5]	Building Services Engineering
MECH 5205 [0.5]	Building Performance Simulation
<b>3. 1.0 credits in</b> approved electives	1.0
<b>4. 1.0 credit in:</b>	1.0
BLDG 5900 [1.0]	M.Eng. Project
<b>Total Credits</b>	<b>5.0</b>

### M.Eng. Building Engineering with Concentration in Fire Safety (5.0 credits)

#### Requirements - Coursework pathway:

<b>1. 1.0 credit in:</b>	1.0
BLDG 5101 [0.5]	Introduction to Building Engineering
BLDG 5103 [0.5]	Research Methods for Building Engineering
<b>2. 2.0 credits in</b> the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.	2.0
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering
CIVE 5610 [0.5]	Fire Dynamics I
CIVE 5612 [0.5]	Fire Modeling
CIVE 5613 [0.5]	Fire Dynamics II
CIVE 5614 [0.5]	Design for Fire Resistance
CIVE 5615 [0.5]	Fire Behaviour of Materials
<b>3. 2.0 credits in</b> approved electives	2.0
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Project pathway:

<b>1. 1.0 credit in:</b>	1.0
BLDG 5101 [0.5]	Introduction to Building Engineering
BLDG 5103 [0.5]	Research Methods for Building Engineering
<b>2. 2.0 credits in</b> the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.	2.0
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering
CIVE 5610 [0.5]	Fire Dynamics I
CIVE 5612 [0.5]	Fire Modeling
CIVE 5613 [0.5]	Fire Dynamics II
CIVE 5614 [0.5]	Design for Fire Resistance
CIVE 5615 [0.5]	Fire Behaviour of Materials
<b>3. 1.0 credits in</b> approved electives	1.0
<b>4. 1.0 credit in:</b>	1.0

BLDG 5900 [1.0]	M.Eng. Project	
<b>Total Credits</b>		<b>5.0</b>
<b>M.Eng. Building Engineering with Concentration in Heritage Conservation (5.0 credits)</b>		
<b>Requirements - Project pathway:</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
BLDG 5101 [0.5]	Introduction to Building Engineering	
BLDG 5103 [0.5]	Research Methods for Building Engineering	
<b>2. 2.0 credits in the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.</b>		<b>2.0</b>
ARCN 5100 [0.5]	Representation and Documentation in Architectural Conservation	
ARCC 5401 [0.5]	Workshop: Technical Studies in Heritage Conservation	
BLDG 5201 [0.5]	Advanced Building Characterization, Conservation and Rehabilitation	
BLDG 5203 [0.5]	Advanced Computational Modeling Strategies of Historic Buildings	
CDNS 5403 [0.5]	Heritage Conservation and Sustainability	
<b>3. 1.0 credits in approved electives</b>		<b>1.0</b>
<b>4. 1.0 credit in:</b>		<b>1.0</b>
BLDG 5900 [1.0]	M.Eng. Project	
<b>Total Credits</b>		<b>5.0</b>

<b>Requirements - Coursework pathway:</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
BLDG 5101 [0.5]	Introduction to Building Engineering	
BLDG 5103 [0.5]	Research Methods for Building Engineering	
<b>2. 2.0 credits in the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.</b>		<b>2.0</b>
ARCC 5401 [0.5]	Workshop: Technical Studies in Heritage Conservation	
ARCN 5100 [0.5]	Representation and Documentation in Architectural Conservation	
BLDG 5201 [0.5]	Advanced Building Characterization, Conservation and Rehabilitation	
BLDG 5203 [0.5]	Advanced Computational Modeling Strategies of Historic Buildings	
CDNS 5403 [0.5]	Heritage Conservation and Sustainability	
<b>3. 2.0 credits in approved electives</b>		<b>2.0</b>
<b>Total Credits</b>		<b>5.0</b>

### Ph.D. Building Engineering (2.0 credits)

<b>Requirements:</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
BLDG 5101 [0.5]	Introduction to Building Engineering	
<b>2. 1.0 credit from the following list. Other courses may be used, with Supervisor recommendation and Director approval.</b>		<b>1.0</b>
BLDG 5103 [0.5]	Research Methods for Building Engineering	

ARCN 5100 [0.5]	Representation and Documentation in Architectural Conservation	
ARCC 5401 [0.5]	Workshop: Technical Studies in Heritage Conservation	
CDNS 5403 [0.5]	Heritage Conservation and Sustainability	
BLDG 5301 [0.5]	Building Energy Management and Optimization	
BLDG 5302 [0.5]	Building Services Engineering	
BLDG 5201 [0.5]	Advanced Building Characterization, Conservation and Rehabilitation	
BLDG 5202 [0.5]	Structural Assessment of Historic Buildings	
BLDG 5203 [0.5]	Advanced Computational Modeling Strategies of Historic Buildings	
CIVE 5609 [0.5]	Fundamentals of Fire Safety Engineering	
CIVE 5610 [0.5]	Fire Dynamics I	
CIVE 5612 [0.5]	Fire Modeling	
CIVE 5613 [0.5]	Fire Dynamics II	
CIVE 5614 [0.5]	Design for Fire Resistance	
CIVE 5615 [0.5]	Fire Behaviour of Materials	
MECH 5205 [0.5]	Building Performance Simulation	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
BLDG 6901 [0.5]	Thesis Proposal	
<b>4. 0.0 credit in:</b>		
BLDG 6909 [0.0]	Ph.D. Thesis	
<b>Total Credits</b>		<b>2.0</b>

### Ph.D. Building Engineering with Concentration in Building Performance (2.0 credits)

<b>Requirements:</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
BLDG 5101 [0.5]	Introduction to Building Engineering	
<b>2. 1.0 credit in the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.</b>		<b>1.0</b>
BLDG 5103 [0.5]	Research Methods for Building Engineering	
BLDG 5104 [0.5]	Indoor Environmental Quality	
BLDG 5301 [0.5]	Building Energy Management and Optimization	
BLDG 5302 [0.5]	Building Services Engineering	
MECH 5205 [0.5]	Building Performance Simulation	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
BLDG 6901 [0.5]	Thesis Proposal (in the area of the concentration)	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
BLDG 6909 [0.0]	Ph.D. Thesis (in the area of the concentration)	
<b>Total Credits</b>		<b>2.0</b>

### Ph.D. Building Engineering with Concentration in Fire Safety (2.0 credits)

<b>Requirements:</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
BLDG 5101 [0.5]	Introduction to Building Engineering	

<b>2. 1.0 credit in</b> the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.	<b>1.0</b>
CIVE 5609 [0.5] Fundamentals of Fire Safety Engineering	
CIVE 5610 [0.5] Fire Dynamics I	
CIVE 5612 [0.5] Fire Modeling	
CIVE 5613 [0.5] Fire Dynamics II	
CIVE 5614 [0.5] Design for Fire Resistance	
CIVE 5615 [0.5] Fire Behaviour of Materials	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
BLDG 6901 [0.5] Thesis Proposal (in the area of the concentration)	
<b>4. 0.0 credit in:</b>	
BLDG 6909 [0.0] Ph.D. Thesis (in the area of the concentration)	
<b>Total Credits</b>	<b>2.0</b>

### Ph.D. Building Engineering with Concentration in Heritage Conservation (2.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
BLDG 5101 [0.5] Introduction to Building Engineering	
<b>2. 1.0 credit in</b> the concentration, from the following list. Other courses may be used, with Supervisor recommendation and Director approval.	<b>1.0</b>
BLDG 5201 [0.5] Advanced Building Characterization, Conservation and Rehabilitation	
BLDG 5202 [0.5] Structural Assessment of Historic Buildings	
BLDG 5203 [0.5] Advanced Computational Modeling Strategies of Historic Buildings	
CDNS 5403 [0.5] Heritage Conservation and Sustainability	
ARCN 5100 [0.5] Representation and Documentation in Architectural Conservation	
ARCC 5401 [0.5] Workshop: Technical Studies in Heritage Conservation	
BLDG 5103 [0.5] Research Methods for Building Engineering	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
BLDG 6901 [0.5] Thesis Proposal (in the area of the concentration)	
<b>4. 0.0 credits in:</b>	<b>0.0</b>
BLDG 6909 [0.0] Ph.D. Thesis (in the area of the concentration)	
<b>Total Credits</b>	<b>2.0</b>

#### Admission

##### M.A.Sc., M. Eng. Building Engineering

The normal requirement for admission to the M.A.Sc. and M.Eng. in Building Engineering is a bachelor's degree in an engineering or related program, with at least a B+ average. Applicants to the M.A.Sc. are required to include a research proposal statement.

##### Ph.D. Building Engineering

The normal requirement for admission to the Ph.D. Building Engineering is a master's degree in an

engineering or related program, with at least a A- average. Applicants are required to include a research proposal statement.

Students registered in the M.A.Sc. Building Engineering program at Carleton University may be permitted to transfer into the Ph.D. program without completing the master's program, provided they meet the following conditions:

- completion of 2.5 credits of master's-level courses with a minimum average of A-,
- demonstration of exceptional research potential,
- formal application for admission to the PhD program no later than the fourth semester of initial registration in the M.A.Sc. program, and
- permission from the Director of the Building Engineering programs.

#### Regulations

See the General Regulations section of this Calendar.

#### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the M.Eng. Building Engineering (coursework and project pathways) is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

#### Building Engineering (BLDG) Courses

##### BLDG 5101 [0.5 credit]

##### Introduction to Building Engineering

Broad introductory and multi-disciplinary coverage of building engineering, with particular emphasis on building performance, heritage conservation, fire safety, and structures. Core competencies including research skills, communication of building engineering topics. Advanced methods for building design and restoration in the architectural, engineering, and construction field.

##### BLDG 5103 [0.5 credit]

##### Research Methods for Building Engineering

Broad set of technical and non-technical research skills to design, conduct, and publish research focused on building engineering. Key areas: defining research problems; literature reviews; methods to conduct research; inferential statistics; measurement and error analysis; design of experiments; presenting and publishing in scientific venues.

Prerequisite(s): enrollment in MEng Building Engineering, MASc Building Engineering, PhD Building Engineering.

**BLDG 5104 [0.5 credit]****Indoor Environmental Quality**

Indoor environmental quality (air quality, thermal, visual, and acoustic comfort); physical and chemical parameters for characterization. Types and sources of indoor air pollution and discomfort; measurement techniques. Heating, ventilation, air conditioning, lighting practices and issues. Modeling of and design for indoor environmental quality.

Precludes additional credit for ENVE 4106.

Also offered at the undergraduate level, with different requirements, as ACSE 4106, for which additional credit is precluded.

**BLDG 5201 [0.5 credit]****Advanced Building Characterization, Conservation and Rehabilitation**

Supporting concepts and techniques for the identification, documentation, and conservation of heritage and existing buildings; advanced workshops by experts from key disciplines and practice areas in heritage conservation.

Includes: Experiential Learning Activity

Also listed as CIVE 5603.

**BLDG 5202 [0.5 credit]****Structural Assessment of Historic Buildings**

General concepts related to conservation of heritage structures; materials, construction techniques and structural components; classical structural analysis approaches; seismic behaviour, damage and collapse mechanisms of historic buildings; modern conservation criteria and practical implementation of repair or strengthening strategies.

Also listed as CIVE 5202.

**BLDG 5203 [0.5 credit]****Advanced Computational Modeling Strategies of Historic Buildings**

Introduction to conservation engineering; commonly used construction materials in historic buildings and their constitutive laws; Graphical and numerical methods to analyze masonry arches; Theory and application of discrete element method and its applications to assess masonry buildings.

Also listed as CIVE 5210.

**BLDG 5301 [0.5 credit]****Building Energy Management and Optimization**

Fault detection and diagnostics; preventive and predictive maintenance; predictive and adaptive control of indoor climate; advanced sensing technologies for the built environment; analysis and modelling using data from buildings; data mining; linear and generalized linear models; optimization methods; model selection and validation; inverse modelling.

**BLDG 5302 [0.5 credit]****Building Services Engineering**

How buildings are designed and operated. The materials provide foundational knowledge to understand building services: mechanical, electrical, plumbing systems with associated controls.

Precludes additional credit for ENVE 4107.

Also offered at the undergraduate level, with different requirements, as ACSE 4107, for which additional credit is precluded.

**BLDG 5900 [1.0 credit]****M.Eng. Project**

Includes: Experiential Learning Activity

**BLDG 5906 [0.5 credit]****Directed Studies**

Supervised by a faculty member, students enrolled in this course will undertake a research project. A final report will be evaluated in determining the course grade.

Prerequisite(s): Open only to students in a Building Engineering Master's program.

**BLDG 5909 [2.5 credits]****M.A.Sc. Thesis****BLDG 6901 [0.5 credit]****Thesis Proposal****BLDG 6906 [0.5 credit]****Directed Studies**

Supervised by a faculty member, students enrolled in this course will undertake a research project. A final report will be evaluated in determining the course grade.

Prerequisite(s): Open only to students in the Building Engineering Ph.D. program.

**BLDG 6909 [0.0 credit]****Ph.D. Thesis**

## Business

This section presents the requirements for programs in:

- **Master of Accounting**
- **Master of Arts Economics with Concentration in Financial Economics - Master of Business Administration with Concentration in Finance and Economics**
- **M.B.A.**
- **M.B.A. with concentration**
- **M.B.A. with concentrations**
- **M.B.A. Concentration in Arts Management**
- **M.B.A. Concentration in Business Analytics**
- **M.B.A. Concentration in Financial Management**
- **M.B.A. Concentration in Management and Change**
- **M.B.A. with Collaborative Specialization in Climate Change**
- **Master of Business Administration with Collaborative Specialization in African Studies**
- **M.Sc. Management**
- **M.Sc. Management with Collaborative Specialization in Climate Change**
- **Ph.D. Management**

### Program Requirements

#### Master of Accounting (6.0 credits)

##### Requirements:

<b>1. 5.0 credits in compulsory courses:</b>	<b>5.0</b>
ACCT 5120 [0.5]	Advanced Concepts
ACCT 5121 [0.5]	Advanced Concepts II
ACCT 5123 [0.5]	Advanced Taxation
ACCT 5124 [0.25]	Data Analytics for Professional Accountants
ACCT 5125 [0.5]	Advanced Assurance
ACCT 5128 [0.25]	Strategy for Professional Accountants
ACCT 5129 [0.25]	Professional Accounting Cases I
ACCT 5130 [0.5]	Advanced Finance
ACCT 5131 [0.5]	Performance Management
ACCT 5134 [0.5]	Advanced Integration I
ACCT 5136 [0.5]	Advanced Integration II
ACCT 5137 [0.25]	Professional Accounting Cases II
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ACCT 5199 [1.0]	Internship
<b>Total Credits</b>	<b>6.0</b>

#### Master of Arts Economics with Concentration in Financial Economics - Master of Business Administration with Concentration in Finance and Economics (10.0 credits)

Students completing the dual degree pathway will graduate with: M.A. Economics with Concentration in Financial Economics, and M.B.A. with Concentration in Financial Economics.

##### Requirements:

<b>1. 6.0 credits in compulsory courses:</b>	<b>6.0</b>
ACCT 5001 [0.25]	Financial Accounting
ACCT 5002 [0.25]	Managerial Accounting
BUSI 5802 [0.25]	Business Ethics
BUSI 5998 [0.0]	MBA Skills Workshop
ECON 5020 [0.5]	Microeconomic Theory
ECON 5021 [0.5]	Macroeconomic Theory
ECON 5027 [0.5]	Econometrics I
ECON 5029 [0.5]	Methods of Economic Research
FINA 5501 [0.25]	Financial Management
FINA 5502 [0.25]	Corporate Finance
IBUS 5701 [0.25]	International Business
ITIS 5401 [0.25]	Managing Information Systems in Organizations
MGMT 5100 [0.5]	Managing People and Organizations
MKTG 5200 [0.5]	Marketing Strategy
TOMS 5302 [0.25]	Operations Management
STGY 5900 [0.5]	Corporate and Business Strategy
STGY 5903 [0.5]	Strategic Concepts
<b>2. 1.75 credits in required concentration courses:</b>	<b>1.75</b>
ECON 5051 [0.5]	Asset Pricing
ECON 5052 [0.5]	Financial Markets and Instruments
FINA 5512 [0.25]	Valuation
FINA 5513 [0.25]	Mergers and Acquisitions
FINA 5521 [0.25]	Financial Management Concentration Integration
<b>3. 0.5 credit in elective concentration from:</b>	<b>0.5</b>
ECON 5055 [0.5]	Financial Econometrics
ECON 5058 [0.5]	Advanced Topics in Financial Economics
ECON 5602 [0.5]	International Monetary Theory and Policy
ECON 5608 [0.5]	Monetary Economics and Financial Intermediation
ECON 5713 [0.5]	Time-Series Econometrics
<b>4. 0.75 credit in M.B.A. elective courses</b>	<b>0.75</b>
<b>5. 1.0 credit in:</b>	<b>1.0</b>
BUSI 5999 [1.0]	Internship (Students with less than two (2) years of relevant professional employment experience must successfully complete the Internship in order to graduate. Students with two or more years relevant work experience may apply for an exemption.)
<b>Total Credits</b>	<b>10.0</b>

#### M.B.A. Core Course Requirements

##### M.B.A. Compulsory Core Courses

ACCT 5001 [0.25]	Financial Accounting
ACCT 5002 [0.25]	Managerial Accounting
BUSI 5801 [0.25]	Statistics for Managers
BUSI 5802 [0.25]	Business Ethics
BUSI 5998 [0.0]	MBA Skills Workshop
FINA 5501 [0.25]	Financial Management
FINA 5502 [0.25]	Corporate Finance

IBUS 5701 [0.25]	International Business
ITIS 5401 [0.25]	Managing Information Systems in Organizations
ITIS 5405 [0.25]	AI for Managers
MGMT 5100 [0.5]	Managing People and Organizations
MKTG 5200 [0.5]	Marketing Strategy
TOMS 5302 [0.25]	Operations Management
STGY 5900 [0.5]	Corporate and Business Strategy
STGY 5903 [0.5]	Strategic Concepts

## M.B.A. Program Structure and Variations

### M.B.A. (8.5 credits)

1. 4.25 credits in compulsory core courses	4.25
2. 3.25 credits in elective courses	3.25
3. 1.0 credit in:	1.0
BUSI 5999 [1.0] Internship <sup>1</sup>	
4. 0.0 credit in:	
BUSI 5998 [0.0] MBA Skills Workshop <sup>2</sup>	
<b>Total Credits</b>	<b>8.5</b>

### M.B.A. with concentration (8.5 credits)

1. 4.25 credits in compulsory core courses	4.25
2. 2.25 credits in a chosen concentration (2.5 credits for Business Analytics)	2.25
3. 1.0 credit in elective courses	1.0
4. 1.0 credit in: <sup>1</sup>	1.0
BUSI 5999 [1.0] Internship <sup>1</sup>	
5. 0.0 credit in:	0.0
BUSI 5998 [0.0] MBA Skills Workshop <sup>2</sup>	
<b>Total Credits</b>	<b>8.5</b>

### M.B.A. with concentrations (9.75 credits)

#### Requirements (full-time stream):

1. 4.25 credits in compulsory core courses	4.25
2. 4.5 credits in the concentrations: 2.25 credits in each of two concentrations (2.5 credits for Business Analytics)	4.5
3. 1.0 credit in:	1.0
BUSI 5999 [1.0] Internship <sup>1</sup>	
4. 0.0 credit in:	0.0
BUSI 5998 [0.0] MBA Skills Workshop <sup>2</sup>	
<b>Total Credits</b>	<b>9.75</b>

<sup>1</sup> Students with less than two (2) years of professional employment experience must successfully complete BUSI 5999 [1.0] Internship in order to graduate. Students with two or more years work experience may apply for an exemption.

#### Variations:

### M.B.A. - Accelerated stream (6.0 credits)

1. 1.75 credits in compulsory core courses <sup>1</sup>	1.75
2. 3.25 credits in elective courses	3.25
3. 1.0 credit in:	1.0
BUSI 5999 [1.0] Internship <sup>2</sup>	
4. 0.0 credit in:	0.0
BUSI 5998 [0.0] MBA Skills Workshop	
<b>Total Credits</b>	<b>6.0</b>

### M.B.A. - Accelerated stream with one concentration (6.0 credits)

1. 1.75 credits in compulsory core courses <sup>1</sup>	1.75
2. 2.25 credits in a chosen concentration (2.5 credits for Business Analytics)	2.25
3. 1.0 credit in elective courses	1.0
4. 1.0 credit in:	1.0
BUSI 5999 [1.0] Internship	
5. 0.0 credit in:	0.0
BUSI 5998 [0.0] MBA Skills Workshop	
<b>Total Credits</b>	<b>6.0</b>

### M.B.A. - Accelerated stream with two concentrations (7.25 credits for full-time stream)

1. 1.75 credits in compulsory core courses <sup>1</sup>	1.75
2. 4.5 credits in the concentrations: 2.25 credits in each of two concentrations (2.5 credits for Business Analytics)	4.5
3. 1.0 credit in:	1.0
BUSI 5999 [1.0] Internship	
4. 0.0 credit in:	0.0
BUSI 5998 [0.0] MBA Skills Workshop	
<b>Total Credits</b>	<b>7.25</b>

<sup>1</sup> The required core courses will be based on previous course work. Courses may vary from one student to another and will depend on their undergraduate program, grades obtained in the relevant undergraduate courses and their chosen concentration.

<sup>2</sup> Students with less than two (2) years of relevant professional employment experience must successfully complete the Internship in order to graduate. Students with two or more years relevant work experience may apply for an exemption.

<sup>3</sup> Non-credit required skills workshop.

## M.B.A. Concentration in Arts Management (2.25 credits)

#### Concentration requirements:

1. 1.25 credits in:	1.25
MGMT 5129 [0.5] Managing the Arts	
MKTG 5229 [0.5] Marketing in the Arts and Culture Sectors	
MGMT 5128 [0.25] Ethical Issues in Managing Arts and Culture Organizations	
2. 1.0 credit in elective concentration courses, taken from one of the following three areas:	1.0
<b>Art History</b>	
ARTH 5112 [0.5] Special Topics in Historiography, Methodology and Criticism	
ARTH 5113 [0.5] Special Topics in Pre-Modernity	
ARTH 5114 [0.5] Special Topics in Feminism and Gender	
ARTH 5115 [0.5] Special Topics in Modern and Contemporary Art	
ARTH 5117 [0.5] Special Topics in Community/Identity	
ARTH 5210 [0.5] Special Topics in Indigenous Art	
ARTH 5218 [0.5] Special Topics in Museum Studies and Curatorial Practice	

ARTH 5403 [0.5]	Special Topics in Architecture and Its Institutions
ARTH 5500 [0.5]	Special Topics in Photography and Its Institutions
<b>Canadian Studies</b>	
CDNS 5302 [0.5]	Canadian Cultural Policy
CDNS 5401 [0.5]	Heritage Conservation: History, Principles, and Concepts
CDNS 5402 [0.5]	Heritage Conservation: Theory in Practice
<b>Music</b>	
One credit from any of the courses between MUSI 5000 and MUSI 5201 (inclusive). Some courses require permission of the department.	
<b>Total Credits</b>	<b>2.25</b>

### **M.B.A. Concentration in Business Analytics (2.5 credits)**

#### **Concentration requirements:**

<b>1. 2.5 credits in:</b>	<b>2.5</b>
DATA 5000 [0.5]	Introduction to Data Science
ITIS 5405 [0.25]	AI for Managers
ITIS 5431 [0.25]	Business Analytics for Managers
ITIS 5433 [0.5]	Business Analytics Methods
ITIS 5434 [0.25]	Data Visualization for Business Analytics
ITIS 5440 [0.5]	Business Analytics Capstone
TOMS 5301 [0.25]	Prescriptive Analytics
<b>Total Credits</b>	<b>2.5</b>

### **M.B.A. Concentration in Financial Management (2.25 credits)**

#### **Concentration requirements:**

<b>1. 2.25 credits in:</b>	<b>2.25</b>
ACCT 5011 [0.25]	Financial Statement Analysis
ACCT 5012 [0.25]	Performance Measurement and Control
ACCT 5013 [0.25]	Financial Reporting and Control in Public Organizations
ACCT 5014 [0.25]	Governance and Accountability
FINA 5511 [0.25]	Investments
FINA 5512 [0.25]	Valuation
FINA 5513 [0.25]	Mergers and Acquisitions
FINA 5514 [0.25]	International Finance
FINA 5521 [0.25]	Financial Management Concentration Integration
<b>Total Credits</b>	<b>2.25</b>

### **M.B.A. Concentration in Management and Change (2.25 credits)**

#### **Concentration requirements:**

<b>1. 2.25 credits in:</b>	<b>2.25</b>
MGMT 5111 [0.25]	Conflict and Negotiation
MGMT 5112 [0.25]	Power and Influence
MGMT 5113 [0.25]	Managing Teams
MGMT 5114 [0.25]	Managing Diversity
MGMT 5115 [0.25]	Leadership
MGMT 5116 [0.25]	Managing Performance
MGMT 5117 [0.25]	Knowledge Management

MGMT 5120 [0.5]	Fundamentals of Leading and Managing Organizational Change
<b>Total Credits</b>	<b>2.25</b>

### **M.B.A. with Collaborative Specialization in Climate Change (8.5 credits)**

#### **Requirements:**

<b>1. 1.0 credit in</b>	<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]	Climate Seminar Series
<b>3. 0.25 credit in</b>	<b>0.25</b>
BUSI 5108 [0.25]	Sustainable Business Development
<b>4. 1.0 credit in</b>	<b>1.0</b>
elective specialization courses designated as having sufficient climate change content, within the School of Business or elsewhere, with permission of the School of Business.	
<b>5. 4.25 credits in</b>	<b>4.25</b>
compulsory core courses	
<b>6. 1.0 credit in</b>	<b>1.0</b>
elective courses	
<b>7. 1.0 credit in:</b>	<b>1.0</b>
BUSI 5999 [1.0]	Internship <sup>1</sup>
<b>8. 0.0 credit in</b>	
BUSI 5998 [0.0]	MBA Skills Workshop <sup>2</sup>
<b>Total Credits</b>	<b>8.5</b>

<sup>1</sup> Students with less than two (2) years of professional employment experience must successfully complete BUSI 5999 [1.0] Internship in order to graduate. Students with two or more years work experience may apply for an exemption.

<sup>2</sup> Non-credit required skills workshop.

### **Master of Business Administration with Collaborative Specialization in African Studies (8.5 credits)**

#### **Requirements:**

<b>1. 0.75 credit in:</b>	<b>0.75</b>
IBUS 5712 [0.25]	Business and Government in Emerging Economies
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 1.5 credit in</b>	<b>1.5</b>
elective specialization courses designated as having sufficient African Studies content, within the School of Business or elsewhere, with permission of African Studies and the School of Business.	
<b>4. 4.25 credits in</b>	<b>4.25</b>
compulsory core courses	
<b>5. 1.0 credits in</b>	<b>1.0</b>
elective courses	
<b>6. 1.0 credit in:</b>	<b>1.0</b>
BUSI 5999 [1.0]	Internship <sup>1</sup>
<b>7. 0.0 credit in:</b>	<b>0.0</b>
BUSI 5998 [0.0]	MBA Skills Workshop <sup>2</sup>
<b>Total Credits</b>	<b>8.5</b>

<sup>1</sup> Students with less than two (2) years of professional employment experience must successfully complete

BUSI 5999 [1.0] Internship in order to graduate. Students with two or more years work experience may apply for an exemption.

<sup>2</sup> Non-credit required skills workshop.

### Additional M.B.A. Elective Courses

These are additional to electives selected from other concentrations, and are available to all M.B.A. students.

BUSI 5106 [0.25]	Business Case Analysis and Presentations
BUSI 5108 [0.25]	Sustainable Business Development
BUSI 5905 [0.5]	Special Topics
BUSI 5906 [0.25]	Special Topics
FINA 5515 [0.5]	Micro Finance
ITIS 5403 [0.25]	ICT for Development
TOMS 5303 [0.25]	Managing Projects

### M.Sc. Management (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

<b>1. 1.5 credits in:</b>	<b>1.5</b>
BUSI 5980 [0.5]	Foundations of Management Theory and Research
BUSI 5981 [0.5]	Statistics for Business Research
BUSI 5982 [0.5]	Research Methodology in Business
<b>2. 0.5 credit from:</b>	<b>0.5</b>
BUSI 5983 [0.5]	Qualitative Research Design
BUSI 5984 [0.5]	Quantitative Research Design
<b>3. 1.0 credit from:</b>	<b>1.0</b>
BUSI 5080 [0.5]	Seminar in Accounting I
BUSI 5081 [0.5]	Seminar in Accounting II
BUSI 5180 [0.5]	Seminar in Management I: Modern Organization Theory
BUSI 5181 [0.5]	Seminar in Management II: Current Topics in Organizational Behaviour
BUSI 5280 [0.5]	Seminar in Marketing I: Management and Strategy
BUSI 5281 [0.5]	Seminar in Marketing II: Consumer Behaviour
BUSI 5380 [0.5]	Seminar in Management of Production/Operations I: Strategic Management of Production Systems
BUSI 5381 [0.5]	Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface
BUSI 5383 [0.5]	Systems Optimization: Methods and Models
BUSI 5480 [0.5]	Seminar in Information Systems I: Research Issues
BUSI 5481 [0.5]	Seminar in Information Systems II: Current Trends
BUSI 5580 [0.5]	Seminar in Finance I: Topical Issues in Investments
BUSI 5581 [0.5]	Seminar in Finance II: Theories and Empirical Methods in Corporate Finance
BUSI 5780 [0.5]	Seminar in International Business I: International Markets and Strategy

BUSI 5781 [0.5]	Seminar in International Business II: Managing in a Global Environment
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or elective courses taken with the permission of the Director of the Graduate Research Program

<b>4. 0.0 credit in:</b>	
BUSI 5987 [0.0]	M.Sc. Thesis Tutorial
<b>5. 2.0 credits in:</b>	<b>2.0</b>
BUSI 5989 [2.0]	M.Sc. Thesis
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits):

<b>1. 1.5 credits in:</b>	<b>1.5</b>
BUSI 5980 [0.5]	Foundations of Management Theory and Research
BUSI 5981 [0.5]	Statistics for Business Research
BUSI 5982 [0.5]	Research Methodology in Business
<b>2. 0.5 credit from:</b>	<b>0.5</b>
BUSI 5983 [0.5]	Qualitative Research Design
BUSI 5984 [0.5]	Quantitative Research Design
<b>3. 2.0 credits from:</b>	<b>2.0</b>
BUSI 5080 [0.5]	Seminar in Accounting I
BUSI 5081 [0.5]	Seminar in Accounting II
BUSI 5180 [0.5]	Seminar in Management I: Modern Organization Theory
BUSI 5181 [0.5]	Seminar in Management II: Current Topics in Organizational Behaviour
BUSI 5280 [0.5]	Seminar in Marketing I: Management and Strategy
BUSI 5281 [0.5]	Seminar in Marketing II: Consumer Behaviour
BUSI 5380 [0.5]	Seminar in Management of Production/Operations I: Strategic Management of Production Systems
BUSI 5381 [0.5]	Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface
BUSI 5383 [0.5]	Systems Optimization: Methods and Models
BUSI 5480 [0.5]	Seminar in Information Systems I: Research Issues
BUSI 5481 [0.5]	Seminar in Information Systems II: Current Trends
BUSI 5580 [0.5]	Seminar in Finance I: Topical Issues in Investments
BUSI 5581 [0.5]	Seminar in Finance II: Theories and Empirical Methods in Corporate Finance
BUSI 5780 [0.5]	Seminar in International Business I: International Markets and Strategy
BUSI 5781 [0.5]	Seminar in International Business II: Managing in a Global Environment

or elective courses taken with the permission of the Director of the Graduate Research Program

<b>4. 1.0 credit in:</b>	<b>1.0</b>
BUSI 5988 [1.0]	M.Sc. Research Essay
<b>Total Credits</b>	<b>5.0</b>

## M.Sc. Management with Collaborative Specialization in Climate Change (5.0 credits)

### Requirements - Thesis pathway (5.0 credits):

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 1.5 credits in:</b>	<b>1.5</b>
BUSI 5980 [0.5]      Foundations of Management Theory and Research	
BUSI 5981 [0.5]      Statistics for Business Research	
BUSI 5982 [0.5]      Research Methodology in Business	
<b>4. 0.5 credit from:</b>	<b>0.5</b>
BUSI 5983 [0.5]      Qualitative Research Design	
BUSI 5984 [0.5]      Quantitative Research Design	
<b>5. 0.0 credit in:</b>	
BUSI 5987 [0.0]      M.Sc. Thesis Tutorial	
<b>6. 2.0 credits in:</b>	<b>2.0</b>
BUSI 5989 [2.0]      M.Sc. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

### Requirements - Research essay pathway (5.0 credits):

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 1.0 credit in approved electives</b>	<b>1.0</b>
<b>4. 1.5 credits in:</b>	<b>1.5</b>
BUSI 5980 [0.5]      Foundations of Management Theory and Research	
BUSI 5981 [0.5]      Statistics for Business Research	
BUSI 5982 [0.5]      Research Methodology in Business	
<b>4. 0.5 credit from:</b>	<b>0.5</b>
BUSI 5983 [0.5]      Qualitative Research Design	
BUSI 5984 [0.5]      Quantitative Research Design	
<b>6. 1.0 credit in:</b>	<b>1.0</b>
BUSI 5988 [1.0]      M.Sc. Research Essay (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

### Research Tutorial

Students working with their supervisors will identify appropriate research topics and questions and will be mentored on how to conduct their thesis research. Research seminar attendance and participation are required.

### Thesis

BUSI 5989 M.Sc. Thesis is equivalent to 2.0 credits and should relate to issues consistent with the general focus of the M.Sc. program. The thesis must represent the results of the candidate's independent research undertaken after being admitted to graduate studies at Carleton University's Sprott School of Business. Previous work of the candidate may be used only as introductory or background material for the thesis.

A candidate may carry on research work related to the thesis off-campus, provided that the work is approved in

advance and arrangements have been made for regular supervision of research thesis activities with the Director of Graduate Research Programs.

Before registering in BUSI 5989, students must first complete a thesis proposal and have their research topic approved in BUSI 5987 M.Sc. Thesis Tutorial.

Each candidate submitting a thesis will be required to pass an oral examination on the subject of the thesis.

## Ph.D. Management (5.0 credits)

This degree can be pursued on a full-time or part-time basis.

### Requirements:

<b>1. 1.5 credits in</b> research and analysis methods	<b>1.5</b>
<b>2. 1.5 credits in</b> seminar courses in functional areas of business, including at least one functional pair of courses	<b>1.5</b>
<b>3. 1.5 credits from</b> a selection of course electives approved by the thesis supervisor or mentor	<b>1.5</b>
<b>4. Presentation and oral defence of the thesis proposal</b>	<b>0.5</b>
<b>5. A Thesis, which must be defended at an oral examination</b>	<b>0.0</b>
<b>6. One written and one oral comprehensive examination</b>	
<b>7. Participation in the Sprott School of Business research seminar series</b>	
<b>8. Participation in the Sprott School of Business teaching seminar series</b>	
<b>9. Classroom teaching or equivalent research supported seminar delivery to professional audiences</b>	
<b>Total Credits</b>	<b>5.0</b>

### Specific course requirements

All students in the doctoral program are required to complete the following courses successfully:

<b>1. 1.5 credits (BUSI 6902 and BUSI 6905 are mandatory) in:</b>	<b>1.5</b>
BUSI 6902 [0.5]      Research Methodology in Business	
BUSI 6903 [0.5]      Qualitative Research Design	
BUSI 6904 [0.5]      Quantitative Research Design	
BUSI 6905 [0.5]      Advanced Statistical Methods for Business Research	
<b>2. 1.5 credits in</b> seminars including at least one functional pair of courses, from the following doctoral seminar courses:	<b>1.5</b>
BUSI 6000 [0.5]      Seminar in Accounting I	
& BUSI 6001 [0.5]      Seminar in Accounting II	
BUSI 6100 [0.5]      Seminar in Management I: Modern Organization Theory	
& BUSI 6101 [0.5]      Seminar in Management II: Current Topics in Organizational Behaviour	
BUSI 6103 [0.5]      Seminar in Strategic Management	
BUSI 6200 [0.5]      Seminar in Marketing I:	
& BUSI 6201 [0.5]      Management and Strategy	
Seminar in Marketing II: Consumer Behaviour	

BUSI 6300 [0.5] & BUSI 6301 [0.5]	Seminar in Management of Production/Operations I: Strategic Management of Production Systems Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface	
BUSI 6400 [0.5] & BUSI 6401 [0.5]	Seminar in Information Systems I: Research Issues Seminar in Information Systems II: Current Trends	
BUSI 6500 [0.5] & BUSI 6501 [0.5]	Seminar in Finance I: Topical issues in Investments Seminar in Finance II: Theories and Empirical Methods in Corporate Finance	
BUSI 6600 [0.5]	Entrepreneurship	
BUSI 6700 [0.5] & BUSI 6705 [0.5]	Seminar in International Business I: International Markets and Strategy Seminar in International Business II: Managing in a Global Environment	
3. The remaining 1.5 credits will be electives that are chosen with the approval of the thesis supervisor to assist in the thesis research process. Courses may be chosen from the list below, from the lists above or from outside the School in a supporting discipline with permission.		1.5
BUSI 6009 [0.5]	Special Topics in Accounting	
BUSI 6104 [0.5]	Managing the Change Process	
BUSI 6109 [0.5]	Special Topics in Management	
BUSI 6209 [0.5]	Special Topics in Marketing	
BUSI 6303 [0.5]	Systems Optimization: Methods and Models	
BUSI 6304 [0.5]	Management of Innovation and Technology	
BUSI 6306 [0.5]	Advanced Methods and Models of Management Science	
BUSI 6309 [0.5]	Special Topics in Operations Management	
BUSI 6409 [0.5]	Special Topics in Information Systems	
BUSI 6509 [0.5]	Special Topics in Finance	
BUSI 6709 [0.5]	Special Topics in International Business	
BUSI 6900 [0.5]	Directed Readings	
BUSI 6901 [0.5]	Special Topics	
BUSI 6910 [0.5]	Foundations of Management Theory and Research	
<b>4. 0.5 credits in:</b>		0.5
BUSI 6907 [0.5]	Ph.D. Thesis Tutorial	
<b>5. 0.0 credit in:</b>		0.0
BUSI 6909 [0.0]	Ph.D. Thesis	

**Directed Reading:** a student may, with the approval of his or her thesis supervisor, take up to two directed readings courses (BUSI 6900 Directed Readings). These courses should relate directly to the student's thesis work.

## Second Point of Entry

Doctoral students who hold an M.Sc. in Management from Carleton University and have been admitted to the second point of entry are required to complete the following courses successfully:

<b>1. 0.5 credit in:</b>		0.5
BUSI 6905 [0.5]	Advanced Statistical Methods for Business Research	
2. 0.5 credit to complete a functional pair of courses (I+II), based on previous coursework or a course taken from item 3 or 4.		0.5
BUSI 6000 [0.5] or BUSI 6001 [0.5]	Seminar in Accounting I Seminar in Accounting II	
BUSI 6100 [0.5] or BUSI 6101 [0.5]	Seminar in Management I: Modern Organization Theory Seminar in Management II: Current Topics in Organizational Behaviour	
BUSI 6200 [0.5] or BUSI 6201 [0.5]	Seminar in Marketing I: Management and Strategy Seminar in Marketing II: Consumer Behaviour	
BUSI 6300 [0.5] or BUSI 6301 [0.5]	Seminar in Management of Production/Operations I: Strategic Management of Production Systems Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface	
BUSI 6400 [0.5] or BUSI 6401 [0.5]	Seminar in Information Systems I: Research Issues Seminar in Information Systems II: Current Trends	
BUSI 6500 [0.5] or BUSI 6501 [0.5]	Seminar in Finance I: Topical issues in Investments Seminar in Finance II: Theories and Empirical Methods in Corporate Finance	
BUSI 6700 [0.5] or BUSI 6705 [0.5]	Seminar in International Business I: International Markets and Strategy Seminar in International Business II: Managing in a Global Environment	
<b>3. 0.5 credit in</b>	functional seminars, from any of the courses listed above in item 2, or BUSI 6103 [0.5] Seminar in Strategic Management, or BUSI 6600 [0.5] Entrepreneurship. With departmental permission, students who have previously and successfully completed at least 1.0 credit in functional seminars at the masters level may replace this requirement with an appropriate graduate elective.	0.5
<b>4. 0.5 credit in</b>	an elective chosen with the approval of the thesis supervisor to assist in the thesis research process. Courses may be chosen from the list below, from the lists above or from outside the School in a supporting discipline with permission.	0.5
BUSI 6009 [0.5]	Special Topics in Accounting	
BUSI 6104 [0.5]	Managing the Change Process	
BUSI 6109 [0.5]	Special Topics in Management	
BUSI 6209 [0.5]	Special Topics in Marketing	
BUSI 6303 [0.5]	Systems Optimization: Methods and Models	
BUSI 6304 [0.5]	Management of Innovation and Technology	

BUSI 6306 [0.5]	Advanced Methods and Models of Management Science	
BUSI 6309 [0.5]	Special Topics in Operations Management	
BUSI 6409 [0.5]	Special Topics in Information Systems	
BUSI 6509 [0.5]	Special Topics in Finance	
BUSI 6709 [0.5]	Special Topics in International Business	
BUSI 6900 [0.5]	Directed Readings	
BUSI 6901 [0.5]	Special Topics	
BUSI 6910 [0.5]	Foundations of Management Theory and Research	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
BUSI 6907 [0.5]	Ph.D. Thesis Tutorial	
<b>6. 0.0 credit in:</b>		<b>0.0</b>
BUSI 6909 [0.0]	Ph.D. Thesis	

### Comprehensive Examinations

All Ph.D. candidates are required to successfully complete a comprehensive examination. The examination will cover material relating to the student's area of specialization, research methodology associated with that area, and important works in the management field. Questions for the examination will be set by the student's comprehensive examination committee. The comprehensive examination will take place over a period of two to three weeks and will consist of a written and an oral part.

The comprehensive examinations must be completed successfully before the Ph.D. proposal defense is scheduled. Under normal circumstances, the written comprehensive and the oral defense must occur within eight terms of a full-time student's initial registration in the Ph.D. program. Part-time students should complete the comprehensives within sixteen terms of initial registration in the Ph.D. program. Students who do not fulfil this requirement will be asked to withdraw from the program.

### Regulations - M.Acct.

See the General Regulations section of this Calendar.

### Guidelines for Completion

Students admitted as full-time students must normally complete their degree requirements within four terms after the date of initial registration.

### Academic Standing

A grade of B- or better is normally required in each credit counted towards the degree. However, a candidate may, with the recommendation of the School and the approval of the Vice Provost (Graduate Studies), be allowed to count a grade of C+ in 0.75 credits.

Withdrawal from the program will be required if an M.Acc. student:

- Receives a grade of lower than B- in 1.25 credits or more, or
- Fails to achieve a weighted GPA of 7.0 after completing 2.0 credits of study, or to maintain it, or

- Receives a grade lower than C+ in the same course more than once.

### Regularly Scheduled Break

For immigration purposes the winter term (January to April) for the full-time MAcct. Program is considered a regularly scheduled break approved by the University. Students should resume full-time studies in May.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### Ph.D. Management

Admission into the Ph.D. Management program will be judged primarily on the applicant's ability to undertake research successfully and his/her prospects for completion of the program.

The normal requirement for admission to the doctoral program in management is a master's degree (or equivalent) in business or a related field with an A-average and a bachelor's degree. A number of years of work experience is desirable.

A student enrolled in a research-based master's program in business who has completed a minimum of 2.5 credits and who has shown outstanding academic performance and research promise may be admitted to the Ph.D. program without completing the master's program. Normal Ph.D. program requirements, as stated below, will apply. Each case will be considered on an individual basis for advanced standing in the Ph.D. program. Advanced standing will be considered for a maximum of 1.5 credits.

Applicants who have completed a thesis-based master's program in business or a related area may have their program requirements adjusted at the time of admission.

Applicants who have completed the M.Sc. Management at Carleton University may be eligible for admission to a second point of entry, to be determined by the Sprott School of Business and Graduate Studies, as outlined in the program requirements.

All Ph.D. candidates, regardless of their previous field of specialization, are expected to have or to acquire a basic knowledge of statistics and at least two of the following areas of management: accounting, finance, information systems, international business, management science, marketing, organizational behaviour, and productions/operations management. Students will be admitted to the program with a course of study designed where appropriate to supplement previous education, experience, and training.

Graduate Management Admission Test (GMAT) - the School requires that all applicants submit scores obtained in the Graduate Management Admission Test (GMAT) offered by the Graduate Management Admission Council (GMAC). Successful candidates will normally have a GMAT score of at least 600. Equivalent GRE scores (as defined by the Educational Testing Service) may be considered.

All applicants whose first language is not English must be tested for proficiency in the English language. See Section 3.6 of the General Regulations section of this Calendar for details.

### Regulations - M.B.A.

See the General Regulations section of this Calendar.

**Academic standing:** a grade of B- or better is normally required in each credit counted towards the degree. However, a candidate may, with the recommendation of the School and the approval of the Vice Provost (Graduate Studies), be allowed to count a grade of C+ in 0.75 credits.

Withdrawal from the program will be required if an M.B.A. student:

- Receives a grade of lower than B- in 1.25 credits or more, or
- Fails to achieve a weighted GPA of 7.0 after completing 2.0 credits of study, or to maintain it, or
- Receives a grade lower than C+ in the same course more than once.

**M.A.-M.B.A.:** students following the M.A.-M.B.A. dual pathway are governed by the academic regulations for the M.B.A. (above) and the M.A. Economics. For academic regulations concerning the M.A., consult the Economics programs section of this Calendar.

### Guidelines for Completion

Details on program timing are provided in the General Regulations section of this Calendar, under **Time Limits for Program Completion**.

Before students take concentration courses, they must have successfully completed the relevant core courses.

Elective credits may be selected from any of the other concentration courses for which students have the prerequisites, M.B.A. electives, 4000-level BUSI courses, or from relevant courses in other departments. Permission of the School is required for elective courses taken outside of Sprott and students are normally limited to no more than 1.5 credits outside of Sprott.

Students having less than two (2) years of professional employment experience must successfully complete BUSI 5999 [1.0] Internship in order to graduate. While enrolled in BUSI 5999, students are permitted to register in no more than the equivalent of 0.5 credit per term and this course(s) must be taken outside of normal working hours.

### Regularly Scheduled Break

For immigration purposes the summer term (May to August) for the MBA Program is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration for students required to take BUSI 5999.

### Regulations

See the General Regulations section of this Calendar.

### Academic Standing

A grade of B- or higher is normally required in each credit counted towards the degree. However, a candidate may, with the recommendation of the School and the approval of the Vice Provost (Graduate Studies), be allowed to count a grade of C+ in 0.5 credit.

Withdrawal from the program will be required if an M.Sc. student:

- Receives a grade of lower than B- in 1.0 credit or more, or
- Fails to achieve a weighted GPA of 7.0 after completing 2.0 credits of study, or to maintain it, or
- Receives a grade lower than C+ in the same course more than once.

### Regulations - PhD

See the General Regulations section of this Calendar.

Academic Standing: doctoral students must normally obtain a grade of B- or better in each credit, and Satisfactory on the comprehensive examinations, the Ph.D. thesis and its oral defence.

### Admission

#### M. Accounting

Applicants are expected to hold an honours bachelor's degree or equivalent, with a minimum overall average of B-; demonstrated coverage of the CPA Competency Map at the 'Entry' level, and a minimum grade of C- in each of the prerequisite courses (courses that meet the Entry level requirements of the CPA Competency Map) with a minimum overall average of B+ in the prerequisite courses.

Students who hold a CPA, CMA designation and who have completed the Strategic Leadership Program, Case Examination and Board Report, may be exempted from the course ACCT 5134 Advanced Integration I, with the approval of the M.Acc. Director.

Proficiency in English is necessary to pursue graduate studies at Carleton University. See Section 3.6 of the General Regulations of this Calendar for English proficiency rules.

#### M.B.A. and M.B.A. Accelerated Stream

- Applicants are expected to hold an Honours bachelor's degree or equivalent, with a minimum overall average of B.
- The Sprott School requires that all applicants submit a GMAT (Graduate Management Admission Test) with a minimum score of 550 or an equivalent GRE (Graduate Record Exam) score. The GRE Comparison Table for Business Schools can be used to calculate equivalent GRE scores.
- Proficiency in English is necessary to pursue graduate studies at Carleton University. See Section 3.6 of the General Regulations of this Calendar for English proficiency rules.

### **M.B.A. Accelerated Stream**

Applicants to the M.B.A. accelerated stream must meet the following additional criteria:

- Must have completed, in the past five years, a four-year bachelor's degree from a recognized Canadian university in Business, or Economics with a minor in Business, or equivalent, and
- Have a minimum overall average of B+.

**Note:** admission is judged primarily on the applicant's ability to successfully undertake advanced study in management based on his/her work experience and achievement, GMAT score and undergraduate grades. Possession of the minimum admission requirements does not, in itself, guarantee acceptance.

### **M.A.-M.B.A.**

Applicants to the M.A.-M.B.A. dual degree pathway must qualify for admission for both the M.A. Economics and the M.B.A. program. For admission information concerning the M.A., consult the Economics program section of this Calendar.

### **M.Sc. Management**

Admission into the M.Sc. in Management program will be judged primarily on the applicant's potential to undertake research successfully and his/her prospects for completion of the program. Applicants will submit a research proposal statement on applying to the program.

The normal requirement for admission to the master's program in management is an Honours Bachelor of Commerce degree (or equivalent, e.g. 4-year Commerce, Bachelor of Business Administration or similar degrees) with at least a B+ average. Applicants who do not meet the normal requirements for admission may be required to complete additional courses, extra to the normal program requirements.

All applicants to the program are required to submit a GMAT (Graduate Management Admission Test) score with a minimum of 600 or an equivalent GRE (Graduate Record Exam) score. To calculate the equivalent GRE score, applicants can use the GRE Comparison Table for Business Schools.

### **Ph.D. Management**

Admission into the Ph.D. Management program will be judged primarily on the applicant's ability to undertake research successfully and his/her prospects for completion of the program.

The normal requirement for admission to the doctoral program in management is a master's degree (or equivalent) in business or a related field with an A-average and a bachelor's degree. A number of years of work experience is desirable.

A student enrolled in a research-based master's program in business who has completed a minimum of 2.5 credits and who has shown outstanding academic performance and research promise may be admitted to the Ph.D. program without completing the master's program. Normal Ph.D. program requirements, as stated below, will apply.

Each case will be considered on an individual basis for advanced standing in the Ph.D. program. Advanced standing will be considered for a maximum of 1.5 credits.

Applicants who have completed a thesis-based master's program in business or a related area may have their program requirements adjusted at the time of admission.

Applicants who have completed the M.Sc. Management at Carleton University may be eligible for admission to a second point of entry, to be determined by the Sprott School of Business and Graduate Studies, as outlined in the program requirements.

All Ph.D. candidates, regardless of their previous field of specialization, are expected to have or to acquire a basic knowledge of statistics and at least two of the following areas of management: accounting, finance, information systems, international business, management science, marketing, organizational behaviour, and productions/operations management. Students will be admitted to the program with a course of study designed where appropriate to supplement previous education, experience, and training.

Graduate Management Admission Test (GMAT) - the School requires that all applicants submit scores obtained in the Graduate Management Admission Test (GMAT) offered by the Graduate Management Admission Council (GMAC). Successful candidates will normally have a GMAT score of at least 600. Equivalent GRE scores (as defined by the Educational Testing Service) may be considered.

All applicants whose first language is not English must be tested for proficiency in the English language. See Section 3.6 of the General Regulations section of this Calendar for details.

### **Transfer from the Master's to the Ph.D. Program**

Students enrolled full-time in the M.Sc. in Management program at Carleton University may be permitted to transfer into the Ph.D. program without completing the master's program, provided they meet the following conditions:

- Completion of 2.5 credits of master's courses with a minimum average of A
- Have demonstrated exceptional research potential
- Make a formal application for admission to the Ph.D. program no later than the third term of initial registration in the M.Sc. program
- Have permission of the Director of Graduate Research Programs.

## **Accounting (ACCT) Courses**

### **ACCT 5001 [0.25 credit]**

#### **Financial Accounting**

Fundamentals of financial accounting. Techniques used to measure business transactions, preparation of financial statements, recording and valuation of assets, liabilities and equities.

Precludes additional credit for BUSI 5004 (no longer offered).

### **ACCT 5002 [0.25 credit]**

#### **Managerial Accounting**

Fundamentals of managerial accounting and control. Techniques for management decision-making, planning, and control including cost-volume-profit analysis, product costing, variance analysis, relevant costing, transfer pricing and the balanced scorecard.

Precludes additional credit for BUSI 5005 (no longer offered).

Prerequisite(s): ACCT 5001.

### **ACCT 5011 [0.25 credit]**

#### **Financial Statement Analysis**

A user-oriented approach to the study of financial statements. The role of the financial statements and the annual report in the financial reporting process, using ratio analysis to analyze firm performance and make forecasts of future performance.

Precludes additional credit for BUSI 5000 (no longer offered).

Prerequisite(s): ACCT 5001.

### **ACCT 5012 [0.25 credit]**

#### **Performance Measurement and Control**

Efficacy and efficiency of corporate strategies. Design and use of performance measurement systems from an organizational integrated systems view. Balanced scorecard, activity-based management, and other performance measurement and control systems.

Includes: Experiential Learning Activity

Precludes additional credit for BUSI 5000 (no longer offered).

Prerequisite(s): ACCT 5002.

### **ACCT 5013 [0.25 credit]**

#### **Financial Reporting and Control in Public Organizations**

Public sector accounting principles, practices, and unique financial reporting requirements. Comparison with private sector financial reporting, control, and performance evaluation.

Prerequisite(s): ACCT 5002.

### **ACCT 5014 [0.25 credit]**

#### **Governance and Accountability**

Corporate governance functions including management and controllership, boards of directors, auditors, security commissions and the control of enterprise-wide risk management. Historical development and evaluation of current practices, including Sarbanes Oxley and its implications.

### **ACCT 5120 [0.5 credit]**

#### **Advanced Concepts**

An in-depth exploration of selected topics in financial accounting, assurance and taxation.

Includes: Experiential Learning Activity

### **ACCT 5121 [0.5 credit]**

#### **Advanced Concepts II**

An in-depth exploration of selected topics in management accounting, finance and corporate governance.

### **ACCT 5122 [0.25 credit]**

#### **Issues in Taxation**

This course will provide students additional knowledge in Canadian Federal Taxation required in the MAcc program. Emphasis on corporate income tax and some specialized topics.

Prerequisite(s): permission of the M.Acc. office.

### **ACCT 5123 [0.5 credit]**

#### **Advanced Taxation**

Canadian taxation planning issues regarding personal and business decisions involving individuals, corporations, partnerships and trusts.

Includes: Experiential Learning Activity

### **ACCT 5124 [0.25 credit]**

#### **Data Analytics for Professional Accountants**

Data and information analysis with application to professional accounting.

### **ACCT 5125 [0.5 credit]**

#### **Advanced Assurance**

Assurance concepts are applied to a range of assurance and auditing engagements, including auditing financial statements and non-financial statement assurance engagements. Current trends in assurance are also explored.

Includes: Experiential Learning Activity

**ACCT 5128 [0.25 credit]****Strategy for Professional Accountants**

Overview of the strategy process required of professional accountants. Case-based course with accounting focus, exploring the development of a company's situation analysis, identification and analysis of strategic and operational issues.

Includes: Experiential Learning Activity

**ACCT 5129 [0.25 credit]****Professional Accounting Cases I**

An introduction to approaching, planning and writing accounting cases, including integration across multiple disciplines.

Includes: Experiential Learning Activity

**ACCT 5130 [0.5 credit]****Advanced Finance**

The impact of the financing decision upon the value of the firm, firm valuation, investing and risk management.

**ACCT 5131 [0.5 credit]****Performance Management**

Exploration of performance management in evaluating organizational performance, management decision making, effective problem solving skills and making recommendations for improvements to organizational operations.

Includes: Experiential Learning Activity

**ACCT 5134 [0.5 credit]****Advanced Integration I**

Discussion, analysis and integration with an emphasis on the application of strategic management to various accounting and finance issues.

Includes: Experiential Learning Activity

Precludes additional credit for ACCT 5133 (no longer offered).

Prerequisite(s): ACCT 5128. Completion of a minimum of 2.0 credits in the Master of Accounting program with a minimum average grade of B-.

**ACCT 5136 [0.5 credit]****Advanced Integration II**

Discussion, analysis and integration of issues involving financial reporting, assurance, finance, management accounting, taxation and/or strategy.

Includes: Experiential Learning Activity

Precludes additional credit for ACCT 5135 (no longer offered).

Prerequisite(s): ACCT 5134.

**ACCT 5137 [0.25 credit]****Professional Accounting Cases II**

A continued development and honing of problem solving abilities when placed in real-life, business situations. Case-writing skills will be finessed, with focus on analysis and integration, while keeping the big picture in mind.

Includes: Experiential Learning Activity

Prerequisite(s): ACCT 5120 and ACCT 5121.

**ACCT 5199 [1.0 credit]****Internship**

Application of M.Acc. course knowledge and building management skills in a professional environment.

Minimum 480 hours. Graded Sat/Uns.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the M.Acc. office.

**Business (BUSI) Courses****BUSI 5001 [1.0 credit]****MBA Integrative Foundation**

An interdisciplinary learning experience that underscores the connections between strategy, ethics, and the global business environment. Includes a range of pedagogical approaches that challenge students and help them see business issues through multiple lenses.

Includes: Experiential Learning Activity

Precludes additional credit for STGY 5903, BUSI 5802, IBUS 5701.

**BUSI 5080 [0.5 credit]****Seminar in Accounting I**

Foundations in accounting theory and research methods in financial accounting, management accounting, taxation and assurance.

Also offered, with different requirements, as BUSI 6000, for which additional credit is precluded.

**BUSI 5081 [0.5 credit]****Seminar in Accounting II**

Research methods, theory and practice in reporting, performance measurement, control, risk management and governance.

Also offered, with different requirements, as BUSI 6001, for which additional credit is precluded.

**BUSI 5106 [0.25 credit]****Business Case Analysis and Presentations**

Introduction to, and practical application of, the methods and tools of rigorous business case analysis and the design of strategic responses, including the preparation and delivery of presentations designed to convince decision makers of the validity of the analysis and strategic response.

Includes: Experiential Learning Activity

**BUSI 5108 [0.25 credit]****Sustainable Business Development**

An integration of sustainable business strategies examining corporate perspectives on environmental and social issues, and the implications on stakeholder management strategies. Students will apply concepts of sustainable business development in analyzing successful and flawed organizational strategies drawn from current business literature.

Includes: Experiential Learning Activity

**BUSI 5120 [0.5 credit]****Business and Environmental Sustainability**

Role of business in creating and responding to environmental challenges. Impact of various business models on environmental sustainability and the potential for business-driven solutions across a range of industry sectors.

Prerequisite(s): BUSI 5108.

Also offered at the undergraduate level, with different requirements, as BUSI 4120, for which additional credit is precluded.

**BUSI 5180 [0.5 credit]****Seminar in Management I: Modern Organization Theory**

The development of post-structuralist organization theory is examined. Theories of organizational culture and symbolism, political theories of organization, ethnomethodological, decision-based and population ecology approaches are investigated. The social, economic, and intellectual forces shaping organization theory provides a major focus.

Also offered, with different requirements, as BUSI 6100, for which additional credit is precluded.

**BUSI 5181 [0.5 credit]****Seminar in Management II: Current Topics in Organizational Behaviour**

Current topics and debates in the research on organizational behaviour. Potential topics include motivation, learning, communication, decision-making, small group behaviour, leadership, careers, power and conflict.

Also offered, with different requirements, as BUSI 6101, for which additional credit is precluded.

**BUSI 5280 [0.5 credit]****Seminar in Marketing I: Management and Strategy**

Marketing theory, history, and developments through the analysis, synthesis, and extension of theoretical and empirical papers on marketing management and strategy including all aspects of the marketing mix plus alliances, competitive advantage, global marketing strategies and segmenting, targeting and positioning.

Also offered, with different requirements, as BUSI 6200, for which additional credit is precluded.

**BUSI 5281 [0.5 credit]****Seminar in Marketing II: Consumer Behaviour**

Consumer decision making theory and practice including information processing, behavioural decision theory and consumer culture theory perspectives.

Also offered, with different requirements, as BUSI 6201, for which additional credit is precluded.

**BUSI 5380 [0.5 credit]****Seminar in Management of Production/Operations I: Strategic Management of Production Systems**

Developing a firm's strategies with respect to facilities, locations, technologies, vertical integration and sourcing arrangements. Recent developments in management policies and practices that enable production systems to excel and grow in the era of innovation-, cost-, time- and quality-based competition.

Also offered, with different requirements, as BUSI 6300, for which additional credit is precluded.

**BUSI 5381 [0.5 credit]****Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface**

The evolution and management of process innovation; management of productivity and sustainability using process technologies; integration of production strategy and technology; and supply chain interactions with development chain. Topics include process re-engineering, quality function deployment, supply chain restructuring and the deployment of process innovations.

Also offered, with different requirements, as BUSI 6301, for which additional credit is precluded.

**BUSI 5383 [0.5 credit]****Systems Optimization: Methods and Models**

Management science approaches in modeling systems for decision-making under certainty and uncertainty.

Linear programming, network flows problems and applications, discrete optimization models, heuristics and metaheuristics, dynamic programming, nonlinear programming, simulation. Links between theory and application will be illustrated through case studies and applied modeling.

Includes: Experiential Learning Activity

Also offered, with different requirements, as BUSI 6303, for which additional credit is precluded.

**BUSI 5480 [0.5 credit]****Seminar in Information Systems I: Research Issues**

Research themes, approaches, and methods prevalent in the Information Systems area. Students will engage in examining research issues in IS and perform critical analyses of the research methodologies used to investigate and report on them.

Includes: Experiential Learning Activity

Also offered, with different requirements, as BUSI 6400, for which additional credit is precluded.

**BUSI 5481 [0.5 credit]****Seminar in Information Systems II: Current Trends**

Theory and practice in current information systems research.

Also offered, with different requirements, as BUSI 6401, for which additional credit is precluded.

**BUSI 5510 [0.5 credit]****Data Science for Business**

Application of advanced quantitative and qualitative techniques to collect, store, clean, analyze and visualize structured and unstructured data. Discussion of data-driven business decision making.

**BUSI 5580 [0.5 credit]****Seminar in Finance I: Topical Issues in Investments**

Selected topics in financial theory. Topics chosen according to new developments in theory and with the interests of the students in mind and may include theory of derivatives, pricing theory, information asymmetries, agency theory, economic efficiency, and empirical methods.

Also offered, with different requirements, as BUSI 6500, for which additional credit is precluded.

**BUSI 5581 [0.5 credit]****Seminar in Finance II: Theories and Empirical Methods in Corporate Finance**

Foundations for empirical research methodologies used in selected papers in finance; informational issues and their impact on capital market efficiency; economics of mergers and acquisitions, dividend and information; and emerging areas in finance such as market failures, corporate governance, financial crisis, and behavioural finance.

Also offered, with different requirements, as BUSI 6501, for which additional credit is precluded.

**BUSI 5780 [0.5 credit]****Seminar in International Business I: International Markets and Strategy**

An advanced examination of contemporary theory on the international expansion of the firm: Globalization, trade and investment flows, trade blocs, and free trade zones; consumers and culture; key actors in global markets; sequential internationalization, expansion modes, and location theory; strategy by firm size.

Also offered, with different requirements, as BUSI 6700, for which additional credit is precluded.

**BUSI 5781 [0.5 credit]****Seminar in International Business II: Managing in a Global Environment**

The role of culture, cognition, and behaviour as it relates to management theory and practices. Issues related to globalization, technology, and workplace diversity are explored through an investigation of cultural theories and their implications for cognition, behaviour, and management.

Also offered, with different requirements, as BUSI 6705, for which additional credit is precluded.

**BUSI 5801 [0.25 credit]****Statistics for Managers**

Techniques for using data to make an informed use of statistics. Applications, interpretation and limitations of results. Sampling, descriptive statistics, probability concepts, estimation and testing of hypotheses and regression, using practical business situations. Precludes additional credit for BUSI 5904.

**BUSI 5802 [0.25 credit]****Business Ethics**

Impact of corporate decisions on society. Models and standards of business ethics and corporate social responsibility (CSR). Methods of measuring and reporting. The rise of corporate power, stakeholder analysis, corporate governance, sustainability, national and international pressures on CSR.

Precludes additional credit for BUSI 5001.

**BUSI 5900 [0.5 credit]****Tutorials/Directed Studies in Business**

Tutorials or directed readings in selected areas of business, involving presentation of papers as the basis for discussion with the tutor.

Prerequisite(s): GPA of 10.0 or higher and permission of the School.

**BUSI 5905 [0.5 credit]****Special Topics**

At the discretion of the School, a course dealing with selected topics of interest to students in the MBA Program. Topics will vary from year to year, and will be announced in advance of the registration period.

Prerequisite(s): Permission of the School.

**BUSI 5906 [0.25 credit]****Special Topics**

At the discretion of the School, a course dealing with selected topics of interest to students in the MBA program. Topics will vary from year to year, and will be announced in advance of the registration period.

Prerequisite(s): permission of the School.

**BUSI 5907 [0.5 credit]****M.B.A. Thesis Tutorial**

A seminar designed to help the student formulate and evaluate specific research topics. The successful submission of a thesis proposal is necessary for the completion of the course.

Prerequisite(s): admission to the program prior to the fall term of 2008 and permission of the M.B.A. Program Director.

**BUSI 5908 [1.0 credit]****M.B.A. Research Project**

Includes: Experiential Learning Activity

Prerequisite(s): admission to the program prior to the fall term of 2008 and permission of the M.B.A. Program Director.

**BUSI 5909 [1.5 credit]****M.B.A. Thesis Research**

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5907 and admission to the program prior to the fall term of 2008 and permission of the M.B.A. Program Director.

**BUSI 5980 [0.5 credit]****Foundations of Management Theory and Research**

Exploration of foundational works in management theory and research. Review of the foundational thinking of scholars that influenced and shaped the management discipline.

Also offered, with different requirements, as BUSI 6910, for which additional credit is precluded.

**BUSI 5981 [0.5 credit]****Statistics for Business Research**

In-depth examination and critique of statistical inference. Linear regression. Statistical computing software will be used.

**BUSI 5982 [0.5 credit]****Research Methodology in Business**

The study of research techniques commonly used in research on business and management issues. The development of knowledge of these methodologies and their application, and their possible use in the thesis research of the student.

Also offered, with different requirements, as BUSI 6902, for which additional credit is precluded.

**BUSI 5983 [0.5 credit]****Qualitative Research Design**

The use of qualitative data in business research.

Discussion of research design, data collection, analysis and interpretation techniques; overview of philosophy of science debates regarding epistemological and ontological stance, with practical experience.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5982.

Also offered, with different requirements, as BUSI 6903, for which additional credit is precluded.

**BUSI 5984 [0.5 credit]****Quantitative Research Design**

In-depth study of theories and assumptions of quantitative research design methodologies in management; exploration of alternative research designs; conceptual understanding and application of statistical methods for data analysis; critique of research from a variety of practice settings applying quantitative design methods; design a research project.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5982.

Also offered, with different requirements, as BUSI 6904, for which additional credit is precluded.

**BUSI 5987 [0.0 credit]****M.Sc. Thesis Tutorial**

An intensive preparation for MSc thesis research, under the direction of one or more members of the school. The successful submission of a thesis proposal is necessary for the completion of this course.

**BUSI 5988 [1.0 credit]****M.Sc. Research Essay****BUSI 5989 [2.0 credits]****M.Sc. Thesis**

M.Sc. Thesis.

Includes: Experiential Learning Activity

**BUSI 5992 [0.25 credit]****Tutorials/Directed Studies in Business**

Tutorials or directed readings in selected areas of business, involving presentation of papers as the basis for discussion with the tutor.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School of Business.

**BUSI 5995 [0.5 credit]****Entrepreneurship**

Fundamentals of entrepreneurship and new venture creation. Topics include opportunity identification, innovation and idea generation, intellectual property and legal considerations, business models, organizational structure, new venture financing, and challenges associated with scaling up.

**BUSI 5997 [0.5 credit]****Project Based Service Learning**

An experiential work environment in which students serve as consultants for a real-world client. Various types of projects are possible depending on the company and their goals/needs. Clients may be internal (Carleton, Sprott) or external (large firm, start-up, individual entrepreneur, not-for-profit).

Includes: Experiential Learning Activity

Prerequisite(s): Permission of the School of Business.

Also offered at the undergraduate level, with different requirements, as BUSI 4800, for which additional credit is precluded.

**BUSI 5998 [0.0 credit]****MBA Skills Workshop**

Provides preparation for the MBA program, as well as professional and career development. The course is graded SAT/UNSAT based on attendance and engagement.

Includes: Experiential Learning Activity

**BUSI 5999 [1.0 credit]****Internship**

A degree requirement for students with less than two years of relevant experience within a professional environment. Focus on the application of MBA course knowledge and building management skills in a business environment.

Includes: Experiential Learning Activity

Prerequisite(s): successful completion of two academic terms; subject to approval by the MBA Office.

Minimum 480 hours.

**BUSI 6000 [0.5 credit]****Seminar in Accounting I**

Foundations in accounting theory and research methods in financial accounting, management accounting, taxation and assurance.

Also offered, with different requirements, as BUSI 5080, for which additional credit is precluded.

**BUSI 6001 [0.5 credit]****Seminar in Accounting II**

Research methods, theory and practice in reporting, performance measurement, control, risk management and governance.

Also offered, with different requirements, as BUSI 5081, for which additional credit is precluded.

**BUSI 6009 [0.5 credit]****Special Topics in Accounting**

Designed to expose students to new and emerging issues in selected areas of accounting research. The topics covered vary from year to year according to varied research expertise among the area faculty.

Prerequisite(s): permission of the School.

**BUSI 6100 [0.5 credit]****Seminar in Management I: Modern Organization Theory**

The development of post-structuralist organization theory is examined. Theories of organizational culture and symbolism, political theories of organization, ethnomethodological, decision-based and population ecology approaches are investigated. The social, economic, and intellectual forces shaping organization theory provides a major focus.

Also offered, with different requirements, as BUSI 5180, for which additional credit is precluded.

**BUSI 6101 [0.5 credit]****Seminar in Management II: Current Topics in Organizational Behaviour**

Current topics and debates in the research on organizational behaviour. Potential topics include motivation, learning, communication, decision-making, small group behaviour, leadership, careers, power and conflict.

Also offered, with different requirements, as BUSI 5181, for which additional credit is precluded.

**BUSI 6103 [0.5 credit]****Seminar in Strategic Management**

Current topics and debates in the research on strategic management, sustainable business development and corporate governance. Foundational theories to be reviewed may include agency, institutional, network, resource-based view, resource dependence, stakeholder, stewardship and transaction cost economics theories. Precludes additional credit for BUSI 6803 (no longer offered).

**BUSI 6104 [0.5 credit]****Managing the Change Process**

The process of organizational change and the external forces which drive such changes. Topics include both micro and macro theories of change and issues around change management such as leadership and resistance to change.

Precludes additional credit for BUSI 6704 (no longer offered).

**BUSI 6109 [0.5 credit]****Special Topics in Management**

Designed to expose students to new and emerging issues in selected areas of management research. The topics covered vary from year to year according to varied research expertise among the area faculty.

Prerequisite(s): permission of the School.

**BUSI 6200 [0.5 credit]****Seminar in Marketing I: Management and Strategy**

Marketing theory, history, and developments through the analysis, synthesis, and extension of theoretical and empirical papers on marketing management and strategy including all aspects of the marketing mix plus alliances, competitive advantage, global marketing strategies and segmenting, targeting and positioning.

Also offered, with different requirements, as BUSI 5280, for which additional credit is precluded.

**BUSI 6201 [0.5 credit]****Seminar in Marketing II: Consumer Behaviour**

Consumer decision making theory and practice including information processing, behavioural decision theory and consumer culture theory perspectives.

Also offered, with different requirements, as BUSI 5281, for which additional credit is precluded.

**BUSI 6209 [0.5 credit]****Special Topics in Marketing**

Designed to expose students to new and emerging issues in selected areas of marketing research. The topics covered vary from year to year according to varied research expertise among the area faculty.

Prerequisite(s): permission of the School.

**BUSI 6300 [0.5 credit]****Seminar in Management of Production/Operations I: Strategic Management of Production Systems**

Developing a firm's strategies with respect to facilities, locations, technologies, vertical integration and sourcing arrangements. Recent developments in management policies and practices that enable production systems to excel and grow in the era of innovation-, cost-, time- and quality-based competition.

Also offered, with different requirements, as BUSI 5380, for which additional credit is precluded.

**BUSI 6301 [0.5 credit]****Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface**

The evolution and management of process innovation; management of productivity and sustainability using process technologies; integration of production strategy and technology; and supply chain interactions with development chain. Topics include process reengineering, quality function deployment, supply chain restructuring and the deployment of process innovations.

Also offered, with different requirements, as BUSI 5381, for which additional credit is precluded.

**BUSI 6303 [0.5 credit]****Systems Optimization: Methods and Models**

Management science approaches in modeling systems for decision-making under certainty and uncertainty.

Linear programming, network flows problems and applications, discrete optimization models, heuristics and metaheuristics, dynamic programming, nonlinear programming, simulation. Links between theory and application will be illustrated through case studies and applied modeling.

Includes: Experiential Learning Activity

Precludes additional credit for BUSI 6703.

Prerequisite(s): permission of the School.

Also offered, with different requirements, as BUSI 5383, for which additional credit is precluded.

**BUSI 6304 [0.5 credit]****Management of Innovation and Technology**

Introduction to issues in the management of technology.

Topics include: technology strategy and policy, technology forecasting and planning, the process of technology innovation from concept to market, research and development management, technology adoption, diffusion and implementation, technology transfer, and technology and social issues.

Precludes additional credit for BUSI 6801 (no longer offered).

**BUSI 6306 [0.5 credit]****Advanced Methods and Models of Management Science**

Advanced study of decision-making under certainty and uncertainty. Preprocessing and reformulation methods, optimization theory for large scale problems; stochastic programming; metaheuristics; multicriteria analysis; simulation. Links between theory and application will be illustrated through case studies and applied modeling.

Includes: Experiential Learning Activity

Precludes additional credit for BUSI 6906 (no longer offered).

Prerequisite(s): BUSI 6303 or permission of the School.

**BUSI 6309 [0.5 credit]****Special Topics in Operations Management**

Designed to expose students to new and emerging issues in selected areas of operations management research. The topics covered vary from year to year according to varied research expertise among the area faculty. Includes: Experiential Learning Activity  
Prerequisite(s): permission of the School.

**BUSI 6400 [0.5 credit]****Seminar in Information Systems I: Research Issues**

Research themes, approaches, and methods prevalent in the Information Systems area. Students will engage in examining research issues in IS and perform critical analyses of the research methodologies used to investigate and report on them.  
Also offered, with different requirements, as BUSI 5480, for which additional credit is precluded.

**BUSI 6401 [0.5 credit]****Seminar in Information Systems II: Current Trends**

Theory and practice in current information systems research.  
Also offered, with different requirements, as BUSI 5481, for which additional credit is precluded.

**BUSI 6409 [0.5 credit]****Special Topics in Information Systems**

Designed to expose students to new and emerging issues in selected areas of information systems research. The topics covered vary from year to year according to varied research expertise among the area faculty.  
Prerequisite(s): permission of the School.

**BUSI 6500 [0.5 credit]****Seminar in Finance I: Topical issues in Investments**

Selected topics in financial theory. Topics chosen according to new developments in theory and with the interests of the students in mind and may include theory of derivatives, pricing theory, information asymmetries, agency theory, economic efficiency, and empirical methods.  
Prerequisite(s): graduate-level finance courses or permission of the School.  
Also offered, with different requirements, as BUSI 5580, for which additional credit is precluded.

**BUSI 6501 [0.5 credit]****Seminar in Finance II: Theories and Empirical Methods in Corporate Finance**

Foundations for empirical research methodologies used in selected papers in finance; informational issues and their impact on capital market efficiency; economics of mergers and acquisitions, dividend and information; and emerging areas in finance such as market failures, corporate governance, financial crisis, and behavioural finance.  
Prerequisite(s): graduate-level finance courses or permission of the School.  
Also offered, with different requirements, as BUSI 5581, for which additional credit is precluded.

**BUSI 6509 [0.5 credit]****Special Topics in Finance**

Designed to expose students to new and emerging issues in selected areas of finance research. The topics covered vary from year to year according to varied research expertise among the area faculty.  
Prerequisite(s): permission of the School.

**BUSI 6600 [0.5 credit]****Entrepreneurship**

An examination of research in entrepreneurship focusing on theory building and empirical testing of factors that shapes the identification, evaluation and exploitation of opportunities and the creation of new organizations. Precludes additional credit for BUSI 6806 (no longer offered).

**BUSI 6700 [0.5 credit]****Seminar in International Business I: International Markets and Strategy**

An advanced examination of contemporary theory on the international expansion of the firm: Globalization, trade and investment flows, trade blocs, and free trade zones; consumers and culture; key actors in global markets; sequential internationalization, expansion modes, and location theory; strategy by firm size. Precludes additional credit for BUSI 6804 (no longer offered).  
Also offered, with different requirements, as BUSI 5780, for which additional credit is precluded.

**BUSI 6705 [0.5 credit]****Seminar in International Business II: Managing in a Global Environment**

The role of culture, cognition, and behaviour as it relates to management theory and practices. Issues related to globalization, technology, and workplace diversity are explored through an investigation of cultural theories and their implications for cognition, behaviour, and management.  
Also offered, with different requirements, as BUSI 5781, for which additional credit is precluded.

**BUSI 6709 [0.5 credit]****Special Topics in International Business**

Designed to expose students to new and emerging issues in selected areas of international business research. The topics covered vary from year to year according to varied research expertise among the area faculty.

Prerequisite(s): permission of the School.

**BUSI 6900 [0.5 credit]****Directed Readings**

Directed readings in selected areas of business, involving presentation of papers as the basis for discussion. A part of the requirement for the course may be participation in an advanced course at the undergraduate/graduate level.

Prerequisite(s): permission of the School.

**BUSI 6901 [0.5 credit]****Special Topics**

Designed to expose students to new and emerging issues in selected areas of business research. Integrative problems involving two or more areas of business research are also explored. The topics covered may vary from year to year.

Prerequisite(s): permission of the School.

**BUSI 6902 [0.5 credit]****Research Methodology in Business**

Research techniques commonly used in research on business and management issues. The development of knowledge of these methodologies and their application, and their possible use in the thesis research of the student.

Also offered, with different requirements, as BUSI 5982, for which additional credit is precluded.

**BUSI 6903 [0.5 credit]****Qualitative Research Design**

The use of qualitative data in business research.

Discussion of research design, data collection, analysis and interpretation techniques; overview of philosophy of science debates regarding epistemological and ontological stance; with practical experience.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 6902.

Also offered, with different requirements, as BUSI 5983, for which additional credit is precluded.

**BUSI 6904 [0.5 credit]****Quantitative Research Design**

In-depth study of theories and assumptions of quantitative research design methodologies in management; exploration of alternative research designs; conceptual understanding and application of statistical methods for data analysis; critique of research from a variety of practice settings applying quantitative design methods; design a research project.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 6902.

Also offered, with different requirements, as BUSI 5984, for which additional credit is precluded.

**BUSI 6905 [0.5 credit]****Advanced Statistical Methods for Business Research**

A practical introduction to advanced statistical methods used in business research, with particular focus on discrete categorical data. Topics include the analysis of two-way and three-way tables; loglinear modeling; logistic regression; generalized linear models. Students will analyze real data using appropriate software packages.

Includes: Experiential Learning Activity

**BUSI 6907 [0.5 credit]****Ph.D. Thesis Tutorial**

An intensive preparation for Ph.D. thesis research, under the direction of one or more members of the School. The successful submission of a thesis proposal is necessary for the completion of the course.

**BUSI 6908 [0.0 credit]****Ph.D. Comprehensives**

Preparation for comprehensive examinations.

**BUSI 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

**BUSI 6910 [0.5 credit]****Foundations of Management Theory and Research**

Exploration of foundational works in management theory and research. Review of the foundational thinking of scholars that influenced and shaped the management discipline.

Also offered, with different requirements, as BUSI 5980, for which additional credit is precluded.

## **Financial Management (FINA) Courses**

### **FINA 5501 [0.25 credit]**

#### **Financial Management**

Overview of finance from the perspective of the financial manager. Corporate governance issues, financial markets, time value of money, valuation and yields of financial securities, capital budgeting, financial statement analysis, and the trade-off between risk and return.

Precludes additional credit for BUSI 5504.

Prerequisite(s): ACCT 5001 and BUSI 5801.

### **FINA 5502 [0.25 credit]**

#### **Corporate Finance**

Aspects of corporate finance of most concern to managers: investment, financing and payout decisions, corporate restructuring. Case studies will be used.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5501.

### **FINA 5505 [0.25 credit]**

#### **Corporate Finance - Master of Finance**

Aspects of corporate finance of most concern to managers: investment, financing and payout decisions, corporate governance. Case studies will be used.

Includes: Experiential Learning Activity

Precludes additional credit for FINA 5502.

Prerequisite(s): enrolment in Master of Finance program.

### **FINA 5506 [0.5 credit]**

#### **Financial Statement Analysis**

Analysis and interpretation of an entity's financial statements and annual report from a user perspective.

Ratio analysis is used to analyze firm performance and make forecasts of future performance.

Prerequisite(s): enrolment in Master of Finance program.

Also offered at the undergraduate level, with different requirements, as BUSI 4506, for which additional credit is precluded.

### **FINA 5511 [0.25 credit]**

#### **Investments**

The analytical foundations and tools necessary for successful decision-making by investment managers and analysts and by individual investors. Includes a significant hands-on component.

Prerequisite(s): FINA 5502 or FINA 5505.

### **FINA 5512 [0.25 credit]**

#### **Valuation**

Valuation techniques needed for enterprise valuation. The identification of value drivers, insights into the valuation of companies in different settings. Step-by-step procedures for valuing businesses. Includes a team case analysis and presentation.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5502.

### **FINA 5513 [0.25 credit]**

#### **Mergers and Acquisitions**

Theory and practice of mergers and acquisitions. Skills needed to be effective in mergers and acquisitions. Best practices in deal origination, design, implementation and post merger integration.

Precludes additional credit for BUSI 5500.

Prerequisite(s): FINA 5502.

### **FINA 5514 [0.25 credit]**

#### **International Finance**

Issues encountered by the multinational financial manager in making financing and investment decisions within a global context. Foreign exchange markets, parity conditions, currency quotation methods, management of foreign exchange/political risk and international capital budgeting.

Prerequisite(s): FINA 5502 or FINA 5505.

### **FINA 5515 [0.5 credit]**

#### **Micro Finance**

Introduces students to the theory and practice of microfinance. Provides students with a comprehensive understanding of microfinance, its achievements, its current challenges, and the basic skills needed to manage microfinance institutions (MFIs). Serves as a forum to reflect on the future of microfinance and of.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5502.

Also offered at the undergraduate level, with different requirements, as BUSI 4515, for which additional credit is precluded.

### **FINA 5516 [0.25 credit]**

#### **Derivatives**

Derivative instruments and their use for speculation and hedging. Analysis of different markets where instruments trade, and their characteristics. Pricing models highlighted to determine how individuals and corporations can better manage risk.

Prerequisite(s): FINA 5505.

**FINA 5518 [0.25 credit]****Alternative Investments**

Introduction to a wide range of alternative investments (hedge funds, private equity, real estate, infrastructure, and others), their risk and return, performance measurement, and important considerations when making investment decisions.

Prerequisite(s): FINA 5511 and enrolment in the Master of Finance program.

**FINA 5519 [0.25 credit]****Financial Risk Management**

Principles and techniques of risk management for individuals and organizations. Discussion and measurement of major types of risk (market risk, credit risk, liquidity risk, operational risk). Instruments for hedging risks.

Prerequisite(s): FINA 5516.

**FINA 5521 [0.25 credit]****Financial Management Concentration Integration**

Integrates and applies all the accounting and finance concentration coursework. Critical thinking is stressed via the case study approach. Focuses on complex problems and allows students to gain a deeper understanding of the salient issues discussed within the financial management concentration.

Includes: Experiential Learning Activity

Precludes additional credit for BUSI 5500.

Prerequisite(s): FINA 5511 and FINA 5513.

**FINA 5522 [0.25 credit]****Financial Technology**

Explores emerging technologies in financial markets; and more broadly, examine the role of technological advancement and disruption in markets. Topics include blockchain and cryptocurrencies, robo-advising, peer-to-peer lending, the role of social media in financial markets, algorithmic and high-frequency trading, and artificial intelligence and applications.

Prerequisite(s): FINA 5502 or FINA 5505.

**FINA 5523 [0.25 credit]****Financial Analytics**

Developing statistical models and using simulations to understand financial data using R. Awareness of financial models related to investments and corporate finance and ability to write simple code in R to implement the models in real-world scenarios and to visualize and analyze financial data.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5510 and FINA 5511.

**FINA 5524 [0.25 credit]****Financial Markets and Institutions**

Examines the form and function of various financial institutions and their role in the intermediation process as suppliers of funds as well as the form and function of specific financial markets.

Prerequisite(s): enrolment in the Master of Finance program.

**FINA 5525 [0.25 credit]****Sustainable Finance**

Theoretical and practical application of sustainable finance principles and mechanisms to business issues. Sustainable investments and sustainable finance products. The motivations for sustainability of financial institutions, institutional investors, and their role in speeding up the transition to a sustainable economy.

Prerequisite(s): FINA 5505.

**FINA 5526 [0.25 credit]****Financial Modeling**

The course is focused on the skills and knowledge required to build a spreadsheet-based financial model of a company.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in Master of Finance program.

**FINA 5527 [0.25 credit]****Portfolio Management**

Introducing students to the concepts of investment mix within the overarching Investment Policy Statement of the portfolio. Determining how best to match investments with the objective of the fund, while optimizing risk-adjusted returns.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5511 and enrolment in the Master of Finance program.

**FINA 5528 [0.25 credit]****Equity Analysis 1**

Analysis of companies from a fundamental perspective using different types of corporate equity valuation techniques. Types of equity securities and markets, different equity valuation methods; industry and company analysis.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the Master of Finance program.

**FINA 5529 [0.25 credit]****Equity Analysis 2**

Advanced concepts related to equity valuation, risk management and portfolio management. Passive and active portfolio management and performance evaluation, quantitative and fundamental equity strategies, and advanced valuation methods for estimating a company's intrinsic value including approaches for valuing private companies.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5528.

**FINA 5531 [0.25 credit]****Fixed Income Analysis 1**

Fixed income securities and markets. Fixed-income valuation and return analysis. The term structure of interest rates and yield-spread analysis. Analysis of interest-rate risk and embedded options.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the Master of Finance program.

**FINA 5532 [0.25 credit]****Fixed Income Analysis 2**

Mortgage and asset-based securities; structured products. Analysis of credit risk. Interest rate and credit risk derivatives. Fixed income portfolio management strategies.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5531.

**FINA 5533 [0.25 credit]****Ethics**

Ethical decisions faced by finance professionals. Covers CFA Institute Code of Ethics and Standards of Professional Conduct.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in Master of Finance program.

**FINA 5599 [1.0 credit]****Professional Internship**

Application of MFin course knowledge and building management skills in a professional environment. Minimum 480 hours.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in Master of Finance program.

**FINA 5998 [0.0 credit]****MFin Skills Workshop**

Provides preparation for the MFin internship as well as professional and career development. The course is graded SAT/UNSAT based on attendance and engagement.

Includes: Experiential Learning Activity

Also listed as BUSI 5998.

**Information Systems (ITIS) Courses****ITIS 5000 [0.5 credit]****Introduction to Data Science for Business**

Machine learning; statistics; data science; data ethics; data cleaning; data preparation; data visualization; communication skills to explain advanced analytics.

Precludes additional credit for DATA 5000.

**ITIS 5401 [0.25 credit]****Managing Information Systems in Organizations**

Key issues in managing of information systems in organizations. Business and information technology challenges faced by managers and how decisions are made about acquiring, deploying, and using information technologies to achieve business objectives.

Includes: Experiential Learning Activity

**ITIS 5403 [0.25 credit]****ICT for Development**

Conceptual frameworks to understand the prospects and challenges and roles of information and of information and communications technologies (ICTs) in social and economic development; knowledge and skills to help in the effective planning, development, implementation and management of ICT for development initiatives; case studies.

Includes: Experiential Learning Activity

**ITIS 5405 [0.25 credit]****AI for Managers**

Critical factors to successfully enable and leverage AI within organizations. Introduction to AI concepts, AI strategy, economics of AI, organizational AI Readiness, legal and regulatory issues in managing AI, AI risk management, responsible AI adoption and integration.

**ITIS 5408 [0.5 credit]****Social Analytics**

The process, tools and techniques necessary to acquire, clean, and analyze text that has been generated on social platforms. Social network analysis, sentiment analysis, topic extraction, and co-occurrence analysis.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as BUSI 4408, for which additional credit is precluded.

**ITIS 5411 [0.25 credit]****IT Service Support**

Management of IT processes crucial to business operations. IT service management (ITSM) best practices including service desk management, incident management, problem management, change management, release management, and configuration management.

Prerequisite(s): ITIS 5401.

**ITIS 5412 [0.25 credit]****IT Service Delivery**

Service level management, services reporting, service continuity and availability management, budgeting and accounting for IT services, capacity management and information security management. Service level agreements (SLAs) and information technology security techniques or subjects.

Prerequisite(s): ITIS 5401.

**ITIS 5413 [0.25 credit]****Enterprise Architecture and Governance**

Exploration and analysis of enterprise architecture frameworks used to guide organizations in aligning business and IT strategies and goals while enhancing organizational efficiency in the adoption and use of IT. Models of IT Governance.

Prerequisite(s): ITIS 5401.

**ITIS 5414 [0.25 credit]****Emerging Information Technologies and Business Innovation**

Examines the emerging information technology trends and how new technologies can be incorporated to drive process innovation and improve operational performance.

Prerequisite(s): ITIS 5401, or ITIS 5403 for students in the International Development Management Concentration.

**ITIS 5421 [0.25 credit]****Strategic Management of Technology Concentration Integration**

Components and aspects of technology strategy formulation and its successful implementation in an organization. Technology strategy from a general management perspective, designing and developing technology strategy for sustaining competitiveness. Project-based course.

Includes: Experiential Learning Activity

Prerequisite(s): ITIS 5401, ITIS 5411, ITIS 5412, ITIS 5413.

**ITIS 5431 [0.25 credit]****Business Analytics for Managers**

Decision support systems in organizations; moving from business intelligence to business analytics; big data trends in organizations; theories and trends in data analytics.

Includes: Experiential Learning Activity

Prerequisite(s): ITIS 5401 or permission of the School of Business.

**ITIS 5432 [0.25 credit]****Business Analytics Methods**

Tools for data analytics; analyzing data beyond statistics; data mining and predictive modeling; time series analysis and forecasting; neural networks algorithms in business analytics.

Includes: Experiential Learning Activity

Precludes additional credit for ITIS 5433.

Prerequisite(s): ITIS 5431 and BUSI 5801 (or equivalent).

**ITIS 5433 [0.5 credit]****Business Analytics Methods**

Tools for data analytics; analyzing data beyond statistics; data mining and predictive modeling; decision trees; logistic regression; neural networks; time series analysis and forecasting; algorithms for business analytics.

Includes: Experiential Learning Activity

Precludes additional credit for ITIS 5432.

Prerequisite(s): ITIS 5431 and BUSI 5801 or equivalent.

**ITIS 5434 [0.25 credit]****Data Visualization for Business Analytics**

Principles, techniques, technology and applications of data visualization for decision making; cognition and visual perception; types of visual analysis; interactive dashboards; story telling; infographics.

Includes: Experiential Learning Activity

**ITIS 5440 [0.5 credit]****Business Analytics Capstone**

The capstone course for the Business Analytics concentration. The objective is to be the concentration's culminating course allowing students to undertake a major business analytics project, while refining their knowledge by examining a set of advanced/specialized topics beyond what has been introduced in the program.

Includes: Experiential Learning Activity

Prerequisite(s): ITIS 5433, ITIS 5434, TOMS 5301.

## **International Business (IBUS) Courses**

### **IBUS 5701 [0.25 credit]**

#### **International Business**

Managerial and strategic implications of differing international environments for a variety of business functions including structure and control, managing human resources, marketing, finance and logistics. Complexities of working across political and cultural boundaries.

Includes: Experiential Learning Activity

Precludes additional credit for BUSI 5001.

### **IBUS 5711 [0.25 credit]**

#### **International Marketing and Trade**

Product adaptation, distribution networks, promotion practices, cross-border pricing strategy and regulatory and other limitations. Trade trends and the macro and micro effects of culture provide connecting themes.

Includes: Experiential Learning Activity

Prerequisite(s): IBUS 5701.

### **IBUS 5712 [0.25 credit]**

#### **Business and Government in Emerging Economies**

Projects in emerging economies often involve partnerships between businesses, local governments and foreign donors. Emerging forms of cooperation which address issues of poverty, infrastructure and education. The role of international firms in the process of economic transition.

Includes: Experiential Learning Activity

Prerequisite(s): IBUS 5701.

### **IBUS 5713 [0.25 credit]**

#### **Doing Business in the United States**

The role of the United States as Canada's most important foreign trade partner. The U.S. as a distinct business environment. Regulatory structures, competitive environment, and cross-regional buyer behaviour within the U.S. Comparative view of the business culture in the U.S. and Canada.

Includes: Experiential Learning Activity

Precludes additional credit for BUSI 5300 (no longer offered).

Prerequisite(s): IBUS 5701.

### **IBUS 5714 [0.25 credit]**

#### **Buyer Behaviour in International Markets**

Globalization and the divergent, crossvergent and convergent paradigms are used to explain and analyze the behaviour of buyers across different markets and cultures. Socio-cultural, psychological, organizational and other factors that guide purchase decision-making behavior in consumer and B2B markets are examined.

Includes: Experiential Learning Activity

Prerequisite(s): IBUS 5701.

### **IBUS 5715 [0.25 credit]**

#### **Foreign Markets: Selection, Assessment and Entry Strategies**

Selection and assessment of foreign markets suitable to corporate capabilities. Factors affecting the internationalization of firms, from SMEs and born globals to large multinationals. Methods for foreign market entry and service, from exporting, licensing, and franchising to JVs, M&A's and greenfield investment.

Includes: Experiential Learning Activity

Prerequisite(s): IBUS 5701.

### **IBUS 5716 [0.25 credit]**

#### **Management of International Business**

Operating organizations across national and cultural boundaries adds complexity to the tasks that confront managers and requires specific skills. Topics discussed include motivation, leadership, communication and negotiation in a cross-cultural context as well as the pervasive effects of culture on interactions within and across firms.

Includes: Experiential Learning Activity

Prerequisite(s): IBUS 5701.

### **IBUS 5721 [0.25 credit]**

#### **Regional and Global Business Strategies**

##### **Concentration Integration**

Regional and global business expansion strategies and how global interdependence and regional trade groups affect international investment and marketing strategies. Environmental and political factors that influence policy within and between trade blocs and how businesses participate in these processes.

Includes: Experiential Learning Activity

Prerequisite(s): IBUS 5701 and successful completion of all courses in the International Business concentration.

## **International Development Mgmt (IDMG) Courses**

### **IDMG 5610 [0.25 credit]**

#### **Introduction to International Development**

Overview of the theoretical and practical underpinnings of international development management. Covering macro and micro level perspectives, the course offers rich insights into current approaches and debates in international development management.

Includes: Experiential Learning Activity

## **Management (MGMT) Courses**

### **MGMT 5100 [0.5 credit]**

#### **Managing People and Organizations**

Organizations and the relationships that define them. Theories, concepts and experiential exercises help students understand their own values, attitudes and goals and those of others how to motivate, communicate, teach and lead others; and how to apply these concepts to improving personal and organizational performance.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the MBA program in the Sprott School of Business or permission of the School.

### **MGMT 5111 [0.25 credit]**

#### **Conflict and Negotiation**

Conflict, negotiation and bargaining. The bargaining process, conflict handling and how to analyze, plan and implement successful negotiations. Management and labour objectives and strategies that lead to conflict.

Prerequisite(s): MGMT 5100.

### **MGMT 5112 [0.25 credit]**

#### **Power and Influence**

The role of power and influence in organizations. Sources of power, the effectiveness of various influence tactics, the implications of powerlessness, types of empowerment, organizational politics and fostering constructive versus destructive political behaviour in organizations.

Prerequisite(s): MGMT 5100.

### **MGMT 5113 [0.25 credit]**

#### **Managing Teams**

Factors affecting team performance. Team development, the impact of team size, team processes, organizational practices that support teams, potential team interventions and the unique challenges faced by virtual teams.

Prerequisite(s): MGMT 5100.

### **MGMT 5114 [0.25 credit]**

#### **Managing Diversity**

Exploration of issues arising from diversity within organizations including the implications of cultural differences for motivation, communication, conflict and leadership. Identification of practices that facilitate the effective management of diversity.

Prerequisite(s): MGMT 5100.

### **MGMT 5115 [0.25 credit]**

#### **Leadership**

Post-heroic leadership theories, with a practical emphasis on developing and honing leadership skills in practicing managers. A highly self-reflective course, requiring students to question and share their own leadership styles and situational antecedents.

Prerequisite(s): MGMT 5100.

### **MGMT 5116 [0.25 credit]**

#### **Managing Performance**

Principles and techniques relating to the development, support, and evaluation of employee performance in organizations. Models of individual and organizational performance; identifying high performing employees; methods of measuring performance; employee development and incentive systems.

Prerequisite(s): MGMT 5100.

### **MGMT 5117 [0.25 credit]**

#### **Knowledge Management**

Knowledge as a resource; methodologies for managing ongoing and future knowledge needs in businesses.

As required knowledge is dispersed and developed throughout the globe, international dimensions of knowledge management.

Prerequisite(s): MGMT 5100.

### **MGMT 5120 [0.5 credit]**

#### **Fundamentals of Leading and Managing Organizational Change**

How individuals, groups and organizations respond to change; overview of key change models and change strategy. At the micro level how individuals respond to change, how change should be managed, change management competencies and changing organizational culture.

Includes: Experiential Learning Activity

Prerequisite(s): MGMT 5100 and one of: a) A- in MGMT 5100, or b) enrolment in Management of Change concentration.

### **MGMT 5128 [0.25 credit]**

#### **Ethical Issues in Managing Arts and Culture Organizations**

Ethical issues in the management and governance of arts and culture organizations including cultural appropriation, rights of production and reproduction, artistic ownership, and censorship.

Prerequisite(s): BUSI 5802.

**MGMT 5129 [0.5 credit]****Managing the Arts**

The challenges of managing arts organizations with emphasis on the changing environment of arts consumption and funding. The tensions arising from blending artistic and aesthetic dimensions with functional considerations when judging organizational and personal issues form a continuing theme.

Also offered at the undergraduate level, with different requirements, as BUSI 4129, for which additional credit is precluded.

**Marketing (MKTG) Courses****MKTG 5200 [0.5 credit]****Marketing Strategy**

Essential concepts for cultivating and maintaining successful buyer-seller relationships, customer and competitor analysis, segmentation, targeting, and positioning. Translation of target market and positioning decisions into actionable marketing plans, including product, pricing, channel/promotional decisions, and tools for forecasting/evaluating success. Organizational capstone project required.

**MKTG 5211 [0.25 credit]****Technology Marketing**

Marketing in technology-intensive environments, with focus on business buying processes. Buyer behaviour, competitive and environmental analysis, planning and implementation of product and service innovations, targeting and positioning in the early stages of introduction, management through the growth stages, tracking success and contingency planning.

**MKTG 5229 [0.5 credit]****Marketing in the Arts and Culture Sectors**

Advanced study of marketing within the arts and culture sectors. Facilitates sophisticated understanding of the knowledge and skills required for marketing managers to respond to changing market environments in order to bring arts and culture offerings to their target audiences.

Prerequisite(s): MKTG 5200.

Also offered at the undergraduate level, with different requirements, as BUSI 4229, for which additional credit is precluded.

**Strategic Management (STGY) Courses****STGY 5900 [0.5 credit]****Corporate and Business Strategy**

Strategic management focuses on evaluation of opportunities and threats in external environments in light of an organization's strengths and weaknesses, in order to determine a sustainable competitive advantage. Emphasis on corporate and business level strategic analysis and formulation. Organizational capstone project required.

Includes: Experiential Learning Activity

Prerequisite(s): all other MBA core courses.

**STGY 5903 [0.5 credit]****Strategic Concepts**

An overview of business models and key strategic concepts facing firms in a global environment. Core functional area concepts in accounting, marketing, operations and HR are introduced and integrated through simulation. Skills in managing teams, meetings, business planning and presenting business plans.

Includes: Experiential Learning Activity

Precludes additional credit for BUSI 5001.

**Technology Management (TOMS) Courses****TOMS 5301 [0.25 credit]****Prescriptive Analytics**

Quantitative models focusing on optimization, decision analysis, and simulation for decision-making with less risk and better outcomes. Data integration, model formulation, implementation, result analysis, managerial insights, and applications across various business functions.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5801, ITIS 5431.

**TOMS 5302 [0.25 credit]****Operations Management**

The provision of services and goods to customers, with focus on efficiency, effectiveness, and productivity. Planning and control of processes involving products, workers, equipment, suppliers, and customers. Effects of variation and uncertainty on lead time, inventory, quality, and customer service.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5801.

**TOMS 5303 [0.25 credit]****Managing Projects**

Foundations and core principles of managing projects with an emphasis on supporting techniques, practices, and methods as means for structuring, analyzing, scoping, planning, executing, monitoring, controlling, and reporting.

Includes: Experiential Learning Activity

**TOMS 5305 [0.25 credit]****International Development Projects Preparation and Formulation**

Processes, assessment methodologies and tools, and practices for designing international development projects, developing funding proposals, managing calls for proposals, organizing procurement, and evaluating the implementation of the project's activities.

Includes: Experiential Learning Activity

**TOMS 5311 [0.25 credit]****Quality Management**

Defining quality, quality improvement, six sigma, lean enterprise, benchmarking and control charts; quality audits, ISO 9000, ISO 20000 and the progressive excellence program; role of quality assurance in service and product development; Process management and performance excellence.

Prerequisite(s): BUSI 5801.

**TOMS 5312 [0.25 credit]****Technology Development**

Transformation of knowledge and ideas into products, processes and services. Development/innovation process models, successful and efficient integrated product/process/service development, cross functional teams, quality function deployment, lead-user approach, open innovations paradigm, disruptive innovations, and intellectual property management.

**TOMS 5313 [0.25 credit]****Technology Adoption for Services**

Adoption and implementation of technology- driven products and processes for enhanced services. Technology forecasting and scanning; transfer of technologies including technology sourcing, pricing, transfer modes, and success factors; selection of appropriate technology, its vendor and consultant; risk management; managing change.

**TOMS 5314 [0.25 credit]****Supply Chain Management**

Organizational, strategic and operational aspects of managing supply chain from domestic and international perspectives. Outsourcing strategies, supplier relationship and information sharing, supplier networks, contracting and procurement management, logistic integration, role of information technology, and supply chain performance and metrics.

Includes: Experiential Learning Activity

## Canadian Studies

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This section presents the requirements for programs in:

- **M.A. Canadian Studies**
- **M.A. Canadian Studies with Concentration in Heritage Planning and Studies**
- **M.A. Canadian Studies with Collaborative Specialization in Digital Humanities**
- **Ph.D. Canadian Studies**
- **Ph.D. Canadian Studies with Collaborative Specialization in Political Economy**

**Program Requirements****M.A. Canadian Studies (5.0 credits)****Requirements - coursework pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
CDNS 5001 [0.5] M.A. Core Seminar: Conceptualizing Canada	
<b>2. 4.5 credits in additional coursework chosen from available elective courses. Subject to the approval of the Graduate Supervisor, 1.0 credit may be taken outside the program in a related discipline.</b>	<b>4.5</b>
<b>Total Credits</b>	<b>5.0</b>

**Requirements - research essay pathway (5.0 credits)**

<b>1. 1.0 credit in M.A. Research Essay</b>	<b>1.0</b>
CDNS 5908 [1.0] Research Essay	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
CDNS 5001 [0.5] M.A. Core Seminar: Conceptualizing Canada	
<b>3. 3.5 credits in additional coursework chosen from available elective courses. Subject to the approval of the Graduate Supervisor, 1.0 credit may be taken outside the program in a related discipline.</b>	<b>3.5</b>
<b>Total Credits</b>	<b>5.0</b>

**Requirements - thesis pathway (5.0 credits)**

<b>1. 2.0 credits in M.A. Thesis</b>	<b>2.0</b>
CDNS 5909 [2.0] M.A. Thesis	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
CDNS 5001 [0.5] M.A. Core Seminar: Conceptualizing Canada	
<b>3. 2.5 credits in additional coursework chosen from available elective courses. Subject to the approval of the Graduate Supervisor, 1.0 credit may be taken outside the program in a related discipline.</b>	<b>2.5</b>
<b>Total Credits</b>	<b>5.0</b>

**Thesis/Research Essay Proposal**

At the time of declaring their option, thesis/research essay students are encouraged to declare a preliminary topic and tentative list of potential supervisors. Thesis/research essay students must submit a research proposal to the School that has been approved by their thesis/research essay supervisor prior to registering in CDNS 5908 [1.0] or CDNS 5909 [2.0].

**NOTE:** Students in the thesis or research essay option are restricted to a maximum of 0.5 credit in a Directed Studies course ( CDNS 5901 [0.5]).

## M.A. Canadian Studies with Concentration in Heritage Planning and Studies (5.0 credits)

### Requirements - Thesis pathway:

<b>1. 0.5 credit in:</b>	0.5
CDNS 5001 [0.5]	M.A. Core Seminar: Conceptualizing Canada
<b>2. 1.0 credit in:</b>	1.0
CDNS 5401 [0.5]	Heritage Conservation: History, Principles, and Concepts
CDNS 5402 [0.5]	Heritage Conservation: Theory in Practice
<b>3. 0.5 credit in:</b>	0.5
CDNS 5400 [0.5]	Space, Landscape and Identity in Canada
<b>4. 0.5 credit in:</b>	0.5
CDNS 5403 [0.5]	Heritage Conservation and Sustainability
<b>5. 0.5 credit from:</b>	0.5
Approved elective [0.5 credit], or	
CDNS 5801 [0.5]	Internship/Practicum ( topic or activity related to heritage planning and studies, approved by SICS graduate supervisor)
CDNS 5901 [0.5]	Directed Studies ( topic or activity related to heritage planning and studies, approved by SICS graduate supervisor)
<b>6. 2.0 credits in:</b>	2.0
CDNS 5909 [2.0]	M.A. Thesis (in a topic related to heritage planning and studies, to be approved by SICS graduate supervisor)
<b>Total Credits</b>	<b>5.0</b>

### Requirements - Research essay pathway:

<b>1. 0.5 credit in:</b>	0.5
CDNS 5001 [0.5]	M.A. Core Seminar: Conceptualizing Canada
<b>2. 1.0 credit in:</b>	1.0
CDNS 5401 [0.5]	Heritage Conservation: History, Principles, and Concepts
CDNS 5402 [0.5]	Heritage Conservation: Theory in Practice
<b>3. 0.5 credit in:</b>	0.5
CDNS 5403 [0.5]	Heritage Conservation and Sustainability
<b>4. 0.5 credit in:</b>	0.5
CDNS 5400 [0.5]	Space, Landscape and Identity in Canada
<b>5. 1.5 credits from:</b>	1.5
Approved elective(s), and/or:	
CDNS 5800 [1.0]	Internship/Practicum (topic or activity related to heritage planning and studies)
CDNS 5801 [0.5]	Internship/Practicum (maximum 1.0 credit, topic or activity related to heritage planning and studies)
CDNS 5900 [1.0]	Directed Studies (topic or activity related to heritage planning and studies)

CDNS 5901 [0.5]	Directed Studies (maximum 1.0 credit, topic or activity related to heritage planning and studies)
<b>6. 1.0 credit in:</b>	1.0
CDNS 5908 [1.0]	Research Essay (in a topic related to heritage planning and studies, to be approved by SICS graduate supervisor)
<b>Total Credits</b>	<b>5.0</b>

### Requirements - Coursework pathway:

<b>1. 0.5 credit in:</b>	0.5
CDNS 5001 [0.5]	M.A. Core Seminar: Conceptualizing Canada
<b>2. 1.0 credit in:</b>	1.0
CDNS 5401 [0.5]	Heritage Conservation: History, Principles, and Concepts
CDNS 5402 [0.5]	Heritage Conservation: Theory in Practice
<b>3. 0.5 credit in:</b>	0.5
CDNS 5403 [0.5]	Heritage Conservation and Sustainability
<b>4. 0.5 credit in:</b>	0.5
CDNS 5400 [0.5]	Space, Landscape and Identity in Canada
<b>5. 2.5 credits from:</b>	2.5
Approved elective(s), and/or:	
CDNS 5800 [1.0]	Internship/Practicum (topic or activity related to heritage planning and studies, approved by SICS graduate supervisor)
CDNS 5801 [0.5]	Internship/Practicum (maximum 1.0 credit, topic or activity related to heritage planning and studies, approved by SICS graduate supervisor)
CDNS 5900 [1.0]	Directed Studies (topic or activity related to heritage planning and studies, approved by SICS graduate supervisor)
CDNS 5901 [0.5]	Directed Studies (maximum 1.0 credit, topic or activity related to heritage planning and studies, approved by SICS graduate supervisor)
<b>Total Credits</b>	<b>5.0</b>

## M.A. Canadian Studies with Collaborative Specialization in Digital Humanities (5.0 credits)

### Requirements - coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
CDNS 5001 [0.5]	M.A. Core Seminar: Conceptualizing Canada
DIGH 5000 [0.5]	Issues in the Digital Humanities
DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>2. 1.0 credit in approved Digital Humanities elective courses.</b>	1.0

**3. 3.0 credits in** approved elective courses, Internship/ Practicum, or Directed Studies. 3.0

**Total Credits** 5.0

#### Requirements - research essay pathway (5.0 credits)

**1. 1.0 credit in:** 1.0

CDNS 5908 [1.0] Research Essay (in the specialization)

**2. 0.5 credit in:** 0.5

CDNS 5001 [0.5] M.A. Core Seminar: Conceptualizing Canada

**3. 0.5 credit from:** 0.5

DIGH 5000 [0.5] Issues in the Digital Humanities

DIGH 5800 [0.0] Digital Humanities: Professional Development

**4. 1.0 credit in** approved Digital Humanities elective courses. 1.0

**5. 2.0 credits in** approved elective courses, Internship/ Practicum, or Directed Studies. 2.0

**Total Credits** 5.0

#### Requirements - thesis pathway (5.0 credits)

**1. 2.0 credits in:** 2.0

CDNS 5909 [2.0] M.A. Thesis (in the specialization)

**2. 0.5 credit in:** 0.5

CDNS 5001 [0.5] M.A. Core Seminar: Conceptualizing Canada

**3. 0.5 credit from:** 0.5

DIGH 5000 [0.5] Issues in the Digital Humanities

DIGH 5800 [0.0] Digital Humanities: Professional Development

**4. 1.0 credit in** approved Digital Humanities elective courses. 1.0

**5. 1.0 credit in** approved elective courses, Internship/ Practicum, or Directed Studies. 1.0

**Total Credits** 5.0

#### Thesis/Research Essay Proposal

At the time of declaring their option, thesis/research essay students are encouraged to declare a preliminary topic and tentative list of potential supervisors. Thesis/research essay students must submit a research proposal to the School that has been approved by their thesis/research essay supervisor prior to registering in CDNS 5908 or CDNS 5909.

#### Ph.D. Canadian Studies (3.0 credits)

##### Requirements:

**1. 1.0 credit in:** 1.0

CDNS 6900 [1.0] Ph.D. Core Seminar: Interdisciplinarity in Canadian Studies: Concepts, Theories and Methods

**2. 1.0 credit in** 5000- or 6000-level courses or tutorials (or the equivalent) offered by the School (or approved by the Graduate Supervisor); a GPA of 9.0 or better must be obtained in these courses for students to be allowed to proceed to the comprehensive examinations. 1.0

**3. 1.0 credit in** the successful completion of two 0.5-credit written comprehensive examinations. Students will be examined in two areas of research. (See note) 1.0

4. Language requirement: satisfactory demonstration of an understanding of a language other than English.

5. A public defence, in English, of a written thesis proposal. Following the completion of their comprehensives, students will be expected to defend a proposal of the research and analysis they plan to undertake in completing their Ph.D. thesis. The thesis proposal defence should normally occur within six months after completion of a student's comprehensive examinations and within the first 27 months of registration in the program. The thesis committee will be composed of three faculty members.

**6. 0.0 credits in** a Thesis, which must be successfully defended in English at an oral examination: 0.0

CDNS 6909 [0.0] Ph.D. Thesis

**Total Credits** 3.0

**Note - Comprehensive Examinations:** Full-time students are expected to complete their comprehensive examinations within 24 months of their initial registration in the Ph.D. program. Part-time Ph.D. students should finish their comprehensive examinations within 36 months of completing course work. Both full-time and part-time students should complete their comprehensive examinations before defending their dissertation proposal.

Candidates are required to take an oral examination after each written examination.

#### Language Requirement

This requirement is normally fulfilled in at least one of the following ways: providing evidence of proficiency in a language other than English; completing 1.0 credit in non-English language courses at Carleton University or another post-secondary institution; and/or receiving individual instruction or participating in an online and/or community-led language learning program and providing certification of completion and/or obtaining attestation of basic proficiency from the instructor.

#### Ph.D. Canadian Studies with Collaborative Specialization in Political Economy (3.0 credits)

##### Requirements:

**1. 0.5 credit in:** 0.5

PECO 6000 [0.5] Political Economy: Core Concepts

**2. 0.5 credit in** a relevant political economy course from the approved list or the comprehensive in the major field of Policy, Economy and Society. 0.5

**3. 1.0 credit in:** 1.0

CDNS 6900 [1.0] Ph.D. Core Seminar: Interdisciplinarity in Canadian Studies: Concepts, Theories and Methods

**4. 1.0 credit in** the successful completion of two 0.5-credit written comprehensive examinations. Students will be examined in two areas of research. (See note) 1.0

5. Language requirement: satisfactory demonstration of an understanding of a language other than English.

6. A public defence, in English, of a written thesis proposal. Following the completion of their comprehensives, students will be expected to defend a proposal of the research and analysis they plan to undertake in completing their Ph.D. thesis. The thesis proposal defence should normally occur within six months after completion of a student's comprehensive examinations and within the first 27 months of registration in the program. The thesis committee will be composed of three faculty members.

**7. 0.0 credits in a Thesis** (in the specialization which must be successfully defended in English at an oral examination): 0.0

CDNS 6909 [0.0] Ph.D. Thesis (in the specialization)

**Total Credits** 3.0

**Note - Comprehensive Examinations:** full-time students are expected to complete their comprehensive examinations within 24 months of their initial registration in the Ph.D. program. Part-time Ph.D. students should finish their comprehensive examinations within 36 months of completing course work. Both full-time and part-time students should complete their comprehensive examinations before defending their dissertation proposal.

Candidates are required to take an oral examination after each written examination.

### Language Requirement

This requirement is normally fulfilled in at least one of the following ways: providing evidence of proficiency in a language other than English; completing 1.0 credit in non-English language courses at Carleton University or another post-secondary institution; and/or receiving individual instruction or participating in an online and/or community-led language learning program and providing certification of completion and/or obtaining attestation of basic proficiency from the instructor.

### Regulations

See the General Regulations section of this Calendar.

### Regulations

Consult the General Regulations section of this Calendar.

Doctoral candidates must successfully complete 10.0 credits. Candidates with deficiencies in certain areas may be admitted to the Ph.D. program, but normally will be required to complete additional work.

### Academic Standing

All Ph.D. candidates must obtain at least B+ standing or better (GPA 9.0) in each course counted towards the degree. Comprehensive examinations (which will be graded on a Satisfactory, Unsatisfactory or Pass with Distinction basis) are exempted from this required standing.

### Admission

Applicants to the M.A. Canadian Studies are required to hold a B.A. Honours (or the equivalent), with at least high honours standing.

### Accelerated Pathway

The Accelerated Pathway into the M.A. in Canadian Studies is a flexible and individualized plan of study for

students in their final year of a B.A. Honours in Canadian Studies or a B.A. Indigenous Studies Combined Honours. Students intending to pursue an M.A. in Canadian Studies at Carleton may take up to 1.0 credit at the 5000 level in their final year of undergraduate study and receive advanced standing in the M.A. program with those credits transferred to the graduate program, thereby reducing their time to completion of the M.A.

Students in their third-year of study in these undergraduate degree programs should seek permission from the School of Canadian Studies to determine if the Accelerated Pathway is appropriate for them and to discuss their selection of courses for their final year of undergraduate studies.

### Accelerated Pathway Requirements

1. Minimum overall CGPA of A- at the end of the third year of undergraduate studies
2. Grade of at least B+ in the 1.0 of 5000-level CDNS courses taken in the fourth year of undergraduate studies.

### Qualifying Year

Applicants who do not qualify for direct admission to the master's program may, in exceptional cases, be admitted to a qualifying-year program. However, admission to the qualifying-year program does not imply automatic admission to the master's program. At the end of the qualifying-year program the student will be required to apply for entry into the master's program, at which time the School will determine the student's eligibility to enter the program.

### Proficiency in English

Proficiency in English is necessary to pursue graduate studies at Carleton University. All applicants whose first language is not English must satisfy this requirement by presenting a TOEFL score of 600 or higher.

### Admission

Admission to the Ph.D. Canadian Studies requires a master's degree (or equivalent), with at least high honours standing in Canadian Studies or one of the disciplines represented in the School. Applicants should note, however, that meeting the admission requirement does not guarantee admission to the program.

The Ph.D. program in Canadian Studies normally will be undertaken on a full-time basis. In cases of exceptional merit, the School will accept a few candidates for the degree on a part-time basis.

### Canadian Studies (CDNS) Courses

#### CDNS 5001 [0.5 credit]

#### M.A. Core Seminar: Conceptualizing Canada

Interdisciplinary perspectives on theoretical and methodological approaches to Canadian Studies. Prerequisite(s): Graduate standing in the School.

**CDNS 5002 [0.5 credit]****Interdisciplinary Methods**

A survey of the issues raised by problem-directed methodologies; critiques of existing methodology including from the standpoints of feminist and Aboriginal scholarship.

**CDNS 5003 [0.5 credit]****Selected Topics in Canadian Studies**

Topic varies from year to year.

**CDNS 5101 [0.5 credit]****Indigenous Peoples, Canada and the North**

Interdisciplinary seminar exploring selected Indigenous issues as they relate to historical and ongoing changes in material, social, and cultural phenomena and relationships.

**CDNS 5102 [0.5 credit]****Indigenous Politics and Resurgence in Canada**

Interdisciplinary seminar exploring selected themes in Indigenous politics, experience, and philosophy since the 1960s.

Prerequisite(s): permission of the School of Indigenous and Canadian Studies.

**CDNS 5201 [0.5 credit]****Critical Perspectives on Canadian Feminism**

Interdisciplinary seminar examining Canadian contributions to feminist and gender theory as well as developments in women's movements in a Canadian context.

**CDNS 5202 [0.5 credit]****Gendering Canada: Selected Contemporary Debates**

Interdisciplinary seminar focusing on specific themes that define Canadian women's and gender studies. Themes change yearly but past topics have included sexuality and sexual practices, health and reproductive rights, the body, motherhood and work.

**CDNS 5301 [0.5 credit]****Canadian Cultural Studies**

The arts, belief systems, institutions and communicative practices in Canada in relation to other social and historical structures.

**CDNS 5302 [0.5 credit]****Canadian Cultural Policy**

Evolution of Canadian cultural policy from its origins through to the contemporary search for cultural cohesion within a global context, emphasizing developments since the Massey Commission.

**CDNS 5400 [0.5 credit]****Space, Landscape and Identity in Canada**

Explorations of cultural landscapes and competing constructions of space. Topics may include: settler-colonial space-making, whiteness and space, diasporic space, geographies of gender and sexuality, and different understandings of nature/culture.

Also offered at the undergraduate level, with different requirements, as CDNS 4400, for which additional credit is precluded.

**CDNS 5401 [0.5 credit]****Heritage Conservation: History, Principles, and Concepts**

History of heritage conservation theory in Canada and abroad, as it affects both tangible and intangible heritage; development of the field's conceptual frameworks and operational principles for understanding, evaluating, conserving and managing significant Canadian places of heritage value.

**CDNS 5402 [0.5 credit]****Heritage Conservation: Theory in Practice**

Application of heritage conservation theory to practice. Models for conservation and management of heritage resources in Canada. Research, planning, development, interpretation and the interplay of disciplines within these conservation domains. Frameworks for evaluating programs and policies. Field exercises and visits. Includes: Experiential Learning Activity

**CDNS 5403 [0.5 credit]****Heritage Conservation and Sustainability**

Exploration of the recent shift in heritage conservation discourse that embraces objectives of environmental, social, and economic sustainability. Investigation of synergies and gaps between natural and cultural conservation ideas. Introduction to theory, principles and practices through analysis of Canadian and international research, policy and projects.

Also offered at the undergraduate level, with different requirements, as CDNS 4403, for which additional credit is precluded.

Seminar three hours per week.

**CDNS 5501 [0.5 credit]****Decolonizing Canada: Cultural Politics and Collective Identities**

Interdisciplinary examination of the politics of race, gender, class and cultural pluralism in Canada. Critical theoretical exploration of nationalism, regionalism, multiculturalism, neoliberalism, Aboriginal politics, diaspora and global human rights regimes and claims.

**CDNS 5601 [0.5 credit]**  
**Constructing Canada: The Politics of National Identity**

Interdisciplinary examination of national identity, public opinion, and public policy; the intersection of national visions of Canada and public policy; and the articulation of Canadian distinctiveness and sovereignty on the world stage. Topics include nationalism and national identity, branding Canada, and selected policy fields.

**CDNS 5700 [0.5 credit]**  
**Arctic Passages: The Changing Dynamics of Canada's North**

Interdisciplinary exploration of changing political, economic, and cultural relationships between Inuit and non-Inuit interests in the Canadian Arctic. Emphasis on the role of global processes, such as the rise of the circumpolar movement and environmental change, in mediating these relationships.

**CDNS 5800 [1.0 credit]**  
**Internship/Practicum**

Internships or practicum placements are set in an institutional setting outside of the University. Students in the research essay option are restricted to a maximum of 0.5 credits in an Internship/Practicum. Students must complete a formal written paper in addition to their internship/practicum activities.  
Includes: Experiential Learning Activity  
Prerequisite(s): completion of one full credit of coursework in Canadian Studies and prior approval of the School of Indigenous and Canadian Studies. For students in the coursework option only.

**CDNS 5801 [0.5 credit]**  
**Internship/Practicum**

Internships or practicum placements are set in an institutional setting outside of the University. Students in the research essay option are restricted to a maximum of 0.5 credits in an Internship/Practicum. Students must complete a formal written paper in addition to their internship/practicum activities.  
Includes: Experiential Learning Activity  
Prerequisite(s): completion of one full credit of coursework in Canadian Studies and prior approval of the School of Indigenous and Canadian Studies. For students in the coursework or research essay option only.

**CDNS 5900 [1.0 credit]**  
**Directed Studies**

Reading and research tutorials supervised by a qualified adviser, in an area not covered by an existing seminar. Directed Studies are organized by individual students with a faculty member.  
Prerequisite(s): permission of the School of Indigenous and Canadian Studies.

**CDNS 5901 [0.5 credit]**  
**Directed Studies**

Reading and research tutorials supervised by a qualified adviser, in an area not covered by an existing seminar. Directed Studies are organized by individual students with a faculty member.  
Prerequisite(s): permission of the School of Indigenous and Canadian Studies.

**CDNS 5908 [1.0 credit]**  
**Research Essay**

Approval of the Research Essay Proposal is required prior to registration in this course.

**CDNS 5909 [2.0 credits]**  
**M.A. Thesis**

Approval of the Thesis Proposal is required prior to registration in this course.  
Includes: Experiential Learning Activity

**CDNS 6900 [1.0 credit]**  
**Ph.D. Core Seminar: Interdisciplinarity in Canadian Studies: Concepts, Theories and Methods**

Available only to Ph.D. students in Canadian Studies. An examination of the complex theoretical and methodological issues associated with the discourse on an interdisciplinary study of Canada.  
Prerequisite(s): enrolment in the Canadian Studies Ph.D. program.

**CDNS 6901 [0.5 credit]**  
**Ph.D. Tutorial**

Available only to Ph.D. students in Canadian Studies. Reading and research tutorials. A program of research and written work in an area not covered by an existing graduate seminar.  
Prerequisite(s): permission of the School of Indigenous and Canadian Studies.

**CDNS 6902 [0.5 credit]**  
**Ph.D. Tutorial**

Available only to Ph.D. students in Canadian Studies. Reading and research tutorials. A program of research and written work in an area not covered by an existing graduate seminar.  
Prerequisite(s): permission of the School of Indigenous and Canadian Studies.

**CDNS 6905 [0.5 credit]**  
**Ph.D. Comprehensive Examination**

Available only to Ph.D. students in Canadian Studies. Students will receive a grade of Satisfactory, Unsatisfactory or Pass with Distinction.  
Prerequisite(s): permission of the School of Indigenous and Canadian Studies.

**CDNS 6907 [0.5 credit]****Ph.D. Comprehensive Examination**

Available only to Ph.D. students in Canadian Studies. Students will receive a grade of Satisfactory, Unsatisfactory or Pass with Distinction.

Prerequisite(s): permission of the School of Indigenous and Canadian Studies.

**CDNS 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School of Indigenous and Canadian Studies.

## Chemical and Environmental Toxicology

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This section presents the requirements for programs in:

- **M.Sc. Biology with Collaborative Specialization in Chemical and Environmental Toxicology**
- **M.Sc. Chemistry with Collaborative Specialization in Chemical and Environmental Toxicology**
- **M.Sc. Earth Sciences with Collaborative Specialization in Chemical and Environmental Toxicology**
- **Ph.D. Biology with Collaborative Specialization in Chemical and Environmental Toxicology**
- **Ph.D. Chemistry with Collaborative Specialization in Chemical and Environmental Toxicology**
- **Ph.D. Earth Sciences with Collaborative Specialization in Chemical and Environmental Toxicology**

### Program Requirements

#### **M.Sc. with Collaborative Specialization in Chemical and Environmental Toxicology**

The student is responsible for fulfilling both the Institute and departmental requirements for the Master's degree, and the requirements of the Collaborative Program.

Consult the individual programs for detailed program requirements.

The minimum requirements of the Collaborative Program include completing at least three courses, which include:

1. A relevant introductory course in toxicology (The suitability of any introductory toxicology courses as a prerequisite for the Collaborative Program will be decided by the executive committee, comprised of the Coordinator and Associate Coordinator of the Collaborative Program. It is the student's responsibility to provide justification for an exemption. This can be either:
  - Prior to admission to the Collaborative Program in Chemical and Environmental Toxicology, or
  - By taking one of the two introductory courses, Principles of Toxicology (BIOL 6402/BIO 9101 - CHEM 5708/CHM 8156) or BIOL 6403/BIO 9104 while registered in the Collaborative Program.
2. The Seminar in Toxicology (BIOL 6405/BIO 9105 - CHEM 5805/CHM 8167).
3. Additional courses required by the Master's Program and approved by the Collaborative Program.
4. Thesis Requirement - a research thesis on a topic in toxicology supervised by a faculty member of the Collaborative Program in Chemical and Environmental Toxicology.

**Note:** In addition, the student's Advisory Committee may direct the student to take or audit further courses to complement the student's background and research program. Other courses offered in the programs of the primary academic units of biology or chemistry may be taken as options, with the permission of the

student's supervisory committee, in addition to the basic requirements of the Collaborative Program in Chemical and Environmental Toxicology.

### **M.Sc. Biology with Collaborative Specialization in Chemical and Environmental Toxicology (5.0 credits)**

#### **Requirements:**

<b>1. 1.5 credits in:</b>	<b>1.5</b>
BIOL 6405/ Seminar in Toxicology CHEM 5805 [0.5]	
BIOL 6402/ Principles of Toxicology CHEM 5705 [0.5] or BIOL 6403/ Ecotoxicology CHEM 5708 [0.5]	
and 0.5 credit in additional approved coursework	
<b>2. 3.5 credits in:</b>	<b>3.5</b>
BIOL 5909 [3.5] M.Sc. Thesis (in the specialization, including successful oral defence)	

**Total Credits** **5.0**

### **M.Sc. Chemistry with Collaborative Specialization in Chemical and Environmental Toxicology (5.0 credits)**

#### **Requirements:**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CHEM 5708 [0.5] Principles of Toxicology or CHEM 5705 [0.5] Ecotoxicology	
CHEM 5805 [0.5] Seminar in Toxicology	
<b>2. 0.5 credit in CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department</b>	<b>0.5</b>
<b>3. 0.5 credit in:</b>	<b>0.5</b>
CHEM 5804 [0.5] Modern Scientific Communication	
<b>4. 3.0 credits in:</b>	<b>3.0</b>
CHEM 5909 [3.0] M.Sc. Thesis (in the specialization)	

**Total Credits** **5.0**

### **M.Sc. Earth Sciences with Collaborative Specialization in Chemical and Environmental Toxicology (5.0 credits)**

#### **Requirements:**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
BIOL 6402/ Principles of Toxicology CHEM 5708 [0.5] or BIOL 6403 [0.5] Ecotoxicology or CHEM 5705 [0.5] Ecotoxicology	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
BIOL 6405/ Seminar in Toxicology CHEM 5805 [0.5]	
<b>3. 0.5 credit in additional course work</b>	<b>0.5</b>
<b>4. 3.5 credits in:</b>	<b>3.5</b>
ERTH 5909 [3.5] M.Sc. Thesis (in the specialization)	

5. A pre-defence public lecture, preceding the oral examination, based on the thesis research

6. 0.0 credit: participation in the OCGC Seminar Series. Each student gives a presentation of one lecture (open to all members of the OCGC) describing the candidate's research study within 16 months of the candidate's registration in the M.Sc. program.

**Total Credits** **5.0**

### **Ph.D. (Biology, Chemistry, or Earth Sciences) with Collaborative Specialization in Chemical and Environmental Toxicology**

Students are responsible for fulfilling both the Institute and Departmental requirements for the Ph.D. degree, and the requirements of the Collaborative Program. Consult the individual programs for detailed program requirements.

The requirements of the Collaborative Program are as follows:

1. All courses required by the primary program and approved by the Collaborative Program. If an introductory course (either Principles of Toxicology (BIOL 6402/BIO 9101/CHEM 5708/CHM 8156 or Ecotoxicology (BIOL 6403/BIO 9104/CHEM 5705/CHM 9109 [0.5 credit] , or an approved alternative) has not been completed prior to admission, it must be included among these courses.
2. The Seminar in Toxicology (BIOL 6405/BIO 9105 - CHEM 5805/CHM 8167 [0.5 credit] (see **Note**, below)
3. In addition, students may be directed by their Advisory Committee to take or audit further courses to complement their background and research program. A list of approved electives is provided under 'Graduate Courses'.
4. Thesis Requirement - a research thesis on a topic in toxicology supervised by a faculty member of the Collaborative Program in Chemical and Environmental Toxicology.

**Note:** Item 2 above is not required for students who have already completed the Seminar in Toxicology for the Master's specialization.

### **Ph.D. Biology with Collaborative Specialization in Chemical and Environmental Toxicology (1.5 credits)**

#### **Requirements:**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
BIOL 6405/ Seminar in Toxicology CHEM 5805 [0.5]	
BIOL 6402/ Principles of Toxicology CHEM 5708 [0.5] or BIOL 6403 [0.5] Ecotoxicology or CHEM 5705 [0.5] Ecotoxicology	
<b>2. 0.5 credit in additional course work</b>	<b>0.5</b>
<b>2. 0.0 credits in:</b>	<b>0.0</b>
BIOL 6909 [0.0] Ph.D. Thesis (in the specialization, including successful oral defence)	

**Total Credits** **1.5**

## Ph.D. Chemistry with Collaborative Specialization in Chemical and Environmental Toxicology (3.0 credits)

### Requirements:

<b>1. 1.5 credits from:</b>	<b>1.5</b>
CHEM 5705 [0.5]	Ecotoxicology
CHEM 5708 [0.5]	Principles of Toxicology
CHEM 5805 [0.5]	Seminar in Toxicology (not required for students who have already completed the Seminar in Toxicology for the Master's specialization)
<b>2. 0.5 credit in:</b>	<b>0.5</b>
CHEM 5804 [0.5]	Modern Scientific Communication
<b>3. 1.0 credit in CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department.</b>	<b>1.0</b>
<b>4. Comprehensive examination (see Note below)</b>	
<b>5. Research Proposal (see Note below)</b>	
<b>7. Public lecture, to precede the oral defence</b>	
<b>8. 0.0 credits in:</b>	<b>0.0</b>
CHEM 6909 [0.0]	Ph.D. Thesis (in the specialization)
<b>Total Credits</b>	<b>3.0</b>

## Ph.D. Earth Sciences with Collaborative Specialization in Chemical and Environmental Toxicology (1.0 credit)

### Requirements:

<b>1. 0.0 credits in:</b>	
ERTH 6909 [0.0]	Ph.D. Thesis (a research thesis on a topic in toxicology supervised by a faculty member of the Collaborative Program in Chemical and Environmental Toxicology, defended at an oral examination before an examination board that includes an external examiner)
<b>2. A pre-defence public lecture, preceding the oral examination, based on the thesis research</b>	
<b>3. 1.0 credit in:</b>	<b>1.0</b>
BIOL 6402 [0.5]	Principles of Toxicology
or CHEM 5708 [0.5]	Principles of Toxicology
BIOL 6405 [0.5]	Seminar in Toxicology
or CHEM 5805 [0.5]	Seminar in Toxicology
<b>4. 0.0 credit in:</b>	<b>0.0</b>
ERTH 6908 [0.0]	Ph.D. Comprehensive Examination (Conducted by the thesis advisory committee. Includes the presentation of a thesis proposal)
<b>5. 0.0 credit in: participation in the OCGC Seminar Series. Each student gives a presentation of one lecture (open to all members of the OCGC) describing the candidate's research study within 16 months of the candidate's registration in the Ph.D. program.</b>	<b>0.0</b>
<b>6. Fulfilment of residence requirement: at least four terms of full-time study</b>	<b>0.0</b>
<b>Total Credits</b>	<b>1.0</b>

## Chemical and Environmental Toxicology Courses

Other courses listed in the calendar under the primary academic units of psychology, biology, or chemistry may be taken, with the approval of the student's advisory committee, as options in addition to the basic requirements of the degree in chemical and environmental toxicology.

BIOL 6402/  
CHEM 5708 [0.5]  
(CHM 8156, TOX 8156)

Principles of Toxicology

BIOL 6403/  
CHEM 5705 [0.5]  
(CHM 9109, TOX 9104)

Ecotoxicology

BIOL 6405/  
CHEM 5805 [0.5]  
(TOX 9105)

Seminar in Toxicology

BIOL 5709/  
CHEM 5709 [0.5]  
(TOX 8157)

Chemical Toxicology

### Regulations

See the General Regulations section of this Calendar and the regulations of the primary participating unit for the degree.

### Admission

Applications should be directed to the primary participating unit (i.e. departments of Biology, Chemistry, or Earth Sciences) that is the most appropriate to the student's research interests. Once sponsored and accepted into one of the Institutes, students must be sponsored into the Collaborative Program in Chemical and Environmental Toxicology by a faculty member involved in the program. This will normally be the student's supervisor.

The requirements for admission to the Master's in the Collaborative Program in Chemical and Environmental Toxicology are as follows:

1. Prior admission to the master's program in one of the supporting Institutes participating in the program.
2. A letter of recommendation from the participating faculty member of the collaborative program, which both recommends admission and indicates the willingness of the faculty member to supervise the candidate's research program in Chemical and/or Environmental Toxicology.

### Admission

Applications should be directed to the primary participating unit that is the most appropriate to the student's research interests. Once accepted and registered in one of the Institutes, students must be sponsored into the Collaborative Program in Chemical and Environmental Toxicology by a faculty member involved in the program; this will normally be the student's thesis supervisor. Application forms and further information can be obtained by writing directly to any of the participating Institutes or Departments or to the program Coordinator.

The requirements for admission to the Collaborative Program in Chemical and Environmental Toxicology at the Ph.D. level are as follows:

1. Prior admission to the Ph.D. program in one of the supporting Institutes participating in the program.
2. A letter of recommendation from a participating faculty member who is a member of the Collaborative Program, which both recommends admission and indicates the willingness of the professor to supervise the candidate's research program in Chemical and Environmental Toxicology.

## Chemistry

This section presents the requirements for programs in:

- **M.Sc. Chemistry**
- **M.Sc. Chemistry with Collaborative Specialization in Biochemistry**
- **M.Sc. Chemistry with Collaborative Specialization in Chemical and Environmental Toxicology**
- **M.Sc. in Chemistry with Collaborative Specialization in Data Science**
- **M.Sc. Chemistry with Concentration in Food Science**
- **Ph.D. Chemistry**
- **Ph.D. Chemistry with Collaborative Specialization in Biochemistry**
- **Ph.D. Chemistry with Collaborative Specialization in Chemical and Environmental Toxicology**
- **Ph.D. Chemistry with Concentration in Food Science**

### Program Requirements

#### M.Sc. Chemistry (5.0 credits)

##### Requirements:

<b>1. 0.5 credit in:</b>	0.5
CHEM 5810 [0.5] Seminar	
<b>2. 0.5 credit in:</b>	0.5
CHEM 5804 [0.5] Modern Scientific Communication	
<b>3. 1.0 credit in CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department.</b>	1.0
<b>4. 3.0 credits in:</b>	3.0
CHEM 5909 [3.0] M.Sc. Thesis	
<b>Total Credits</b>	<b>5.0</b>

#### M.Sc. Chemistry with Collaborative Specialization in Biochemistry (4.5 credits)

##### Requirements:

<b>1. 1.0 credit in:</b>	1.0
BIOC 5800 [0.5] Seminar in Biochemistry	
BIOC 5806 [0.5] Advances in Applied Biochemistry	
<b>2. 0.5 credit in:</b>	0.5
CHEM 5804 [0.5] Modern Scientific Communication	
<b>3. 3.0 credits in:</b>	3.0
CHEM 5909 [3.0] M.Sc. Thesis (in the Specialization)	
<b>Total Credits</b>	<b>4.5</b>

#### M.Sc. Chemistry with Collaborative Specialization in Chemical and Environmental Toxicology (5.0 credits)

##### Requirements:

<b>1. 1.0 credit in:</b>	1.0
CHEM 5708 [0.5] Principles of Toxicology	
or CHEM 5705 [0.5] Phototoxicology	
CHEM 5805 [0.5] Seminar in Toxicology	

**2. 0.5 credit in** CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department **0.5**

**3. 0.5 credit in:** **0.5**  
CHEM 5804 [0.5] Modern Scientific Communication

**4. 3.0 credits in:** **3.0**  
CHEM 5909 [3.0] M.Sc. Thesis (in the specialization)

**Total Credits** **5.0**

### **M.Sc. in Chemistry with Collaborative Specialization in Data Science (5.0 credits)**

#### **Requirements:**

**1. 0.5 credit in:** **0.5**  
DATA 5000 [0.5] Introduction to Data Science

**2. 0.5 credit in:** **0.5**  
CHEM 5810 [0.5] Seminar

**3. 0.5 credit in:** **0.5**  
CHEM 5804 [0.5] Modern Scientific Communication

**4. 0.5 credit in** CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department. **0.5**

**5. 3.0 credits in:** **3.0**  
CHEM 5909 [3.0] M.Sc. Thesis (in the specialization)

**Total Credits** **5.0**

### **M.Sc. Chemistry with Concentration in Food Science (5.0 credits)**

#### **Requirements:**

**1. 0.5 credit in:** **0.5**  
FOOD 5810 [0.5] Seminar

**2. 0.5 credit in:** **0.5**  
FOOD 5804 [0.5] Modern Scientific Communication

**3. 0.5 credit in** FOOD at the graduate level. **0.5**

**4. 0.5 credit in** graduate level CHEM or FOOD, or in another discipline, with permission of the department. **0.5**

**5. 3.0 credits in:** **3.0**  
FOOD 5909 [3.0] M.Sc. Thesis (in the concentration)

**Total Credits** **5.0**

### **Ph.D. Chemistry (3.0 credits)**

#### **Requirements:**

**1. 0.5 credits in:** **0.5**  
CHEM 5810 [0.5] Seminar

**2. 0.5 credit in:** **0.5**  
CHEM 5804 [0.5] Modern Scientific Communication

**3. 2.0 credits in** CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department. **2.0**

**4. Comprehensive examination (see Note, below)**

**5. Research Proposal (see Note, below)**

**6. Public lecture, to precede the oral defence**

**7. 0.0 credit in:**  
CHEM 6909 [0.0] Ph.D. Thesis

**Total Credits** **3.0**

### **Ph.D. Chemistry with Collaborative Specialization in Biochemistry (2.5 credits)**

#### **Requirements:**

**1. 0.5 credit in:** **0.5**  
BIOC 5800 [0.5] Seminar in Biochemistry

**2. 0.5 credit in:** **0.5**  
BIOC 5806 [0.5] Advances in Applied Biochemistry

**or, only for students who have already completed  
BIOC 5806, 0.5 credit from the following:**

CHEM 5001 [0.25] Analytical Mass Spectrometry

CHEM 5109 [0.5] Advanced Applications in Mass Spectrometry

CHEM 5111 [0.25] Advanced Topics in Biomolecular Sciences

CHEM 5900 [0.5] Directed Special Studies

**3. 0.5 credit in:** **0.5**  
CHEM 5804 [0.5] Modern Scientific Communication

**4. 1.0 credits in** CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department. **1.0**

**5. Comprehensive examination (see Note below)** **0.0**

**6. Research Proposal (see Note below)**

**7. Public lecture, to precede the oral defence**

**8. 0.0 credits in:**  
CHEM 6909 [0.0] Ph.D. Thesis (in the specialization)

**Total Credits** **2.5**

### **Ph.D. Chemistry with Collaborative Specialization in Chemical and Environmental Toxicology (3.0 credits)**

#### **Requirements:**

**1. 1.5 credits from:** **1.5**  
CHEM 5705 [0.5] Ecotoxicology

CHEM 5708 [0.5] Principles of Toxicology

CHEM 5805 [0.5] Seminar in Toxicology (not required for students who have already completed the Seminar in Toxicology for the Master's specialization)

**2. 0.5 credit in:** **0.5**  
CHEM 5804 [0.5] Modern Scientific Communication

**3. 1.0 credit in** CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department. **1.0**

**4. Comprehensive examination (see Note below)**

**5. Research Proposal (see Note below)**

**7. Public lecture, to precede the oral defence**

**8. 0.0 credits in:** **0.0**  
CHEM 6909 [0.0] Ph.D. Thesis (in the specialization)

**Total Credits** **3.0**

### **Ph.D. Chemistry with Concentration in Food Science (3.0 credits)**

#### **Requirements:**

**1. 0.5 credits in:** **0.5**  
FOOD 5810 [0.5] Seminar

**2. 0.5 credit in:** **0.5**  
FOOD 5804 [0.5] Modern Scientific Communication

3. 0.5 credit in FOOD at the graduate level	0.5
4. 1.5 credit in graduate level CHEM or FOOD, graduate level CHEM or FOOD, or in another discipline, with permission of the department.	1.5
5. Comprehensive examination (see Note, below)	
6. Research Proposal (see Note, below)	
7. Public lecture, to precede the oral defence	
8. 0.0 credits in:	
FOOD 6909 [0.0]    Ph.D. Thesis (in the concentration)	
<b>Total Credits</b>	<b>3.0</b>

#### Note

The Comprehensive Examination examines the depth and breadth of knowledge in the student's own research area.

The Comprehensive Exam needs to be taken at 8 months in the MSc for someone fast-tracking from MSc to PhD, or within the first 8 months of somebody joining the PhD with an MSc.

The Research Proposal involves submission that is both novel and of a sound scientific basis that may be loosely related to the thesis research of the student but not a topic that the student has investigated in any manner. The Research Proposal will be submitted to a committee for oral defense and is normally completed in the ninth term of registration.

Failure to pass either of the Comprehensive Examination or the Research Proposal will result in deregistration from the graduate program.

Students are required to participate in Thesis Advisory Committee (TAC) meetings in terms 2, 5, 8, and 11. If students are unable to defend their dissertation by term 12, further TAC meetings with a plan for completion must occur in term 14 and, if required term 17. All program requirements must be completed within 18 terms (6 years).

If a student is fast tracking from the M.Sc. program to the PhD program and has previously taken CHEM 5801/FOOD 5801 [1.0 credit] and obtained a grade of A-, the student will be given credit for CHEM 5804/FOOD 5804 [0.5 credit] and CHEM 5810/FOOD 5810 [0.5 credit]. Additionally, up to 1.0 credit of graduate courses may be transferred from the M.Sc. provided a grade of at least A- was obtained in each of the courses.

#### Regulations

See the General Regulations section of this Calendar.

#### Residence Requirement

At least one year of full-time study is required for the M.Sc. program.

#### Guidelines for Completion of Master's Degree

Full-time students in the master's program will normally complete the degree requirements in two years. Part-time students will normally complete the degree requirements in four years.

#### Regulations

See the General Regulations section of this Calendar.

#### Thesis Advisory Committee

Within four months of initial registration in the Ph.D. program, a Thesis Advisory Committee (TAC) will be appointed for each student. The committee will consist of a minimum of three members, including the thesis supervisor and, where practicable, at least one member will be from the other campus of OCCI. Committee membership may include adjunct faculty members of the Faculty of Graduate and Postdoctoral Studies (FGPS) at the University of Ottawa or Graduate Studies at Carleton.

Once a year, the student will prepare a formal Thesis Progress Report. The report is not to exceed one page and will outline the problem, methodology used, results achieved, and aims for future research. The TAC will evaluate the report and indicate whether the student has made satisfactory progress. A meeting to discuss the student's progress may be held at any time at the request of either the student or the committee.

#### Admission

Honours B.Sc. degree in Chemistry, with a B+ average in the last two years and a B average overall.

Applicants who do not meet this requirement, or whose undergraduate degree is in another, closely related field, may be accepted into the program, but may be assigned extra courses.

#### Qualifying Year

Applicants who do not qualify for direct admission to the Master's program may be admitted to a qualifying-year program (see 2.3 under General Regulations).

5.0 credits must be completed within two consecutive fall and winter terms, including a 1.0 credit Research Project and Seminar course (CHEM 4908 [1.0]), and 4.0 credits in 0.5- and 0.25-credit courses, as assigned by the Graduate Supervisor. An average grade of A- over these five credits, with a minimum grade of B in each course must be presented to be considered for admission to the M.Sc. program.

#### Orientation Examinations

Students coming from outside Canada or the United States must write orientation examinations at approximately the third-year university level. Each student will be informed of this requirement upon admission. The examinations will be given in the first week of the term in September and January. Students can choose from any three examination modules in: organic, physical, inorganic/analytical and biochemistry.

In examination areas where the student shows unsatisfactory performance or deficiency, the Graduate Supervisor will assign undergraduate-level remedial courses. To be eligible to continue in the graduate program, the student must achieve a minimum grade of A- in each remedial course.

#### Admission

The normal requirement for admission to the Ph.D. program is an M.Sc. degree in Chemistry. Direct entrance

from a B.Sc. degree in Chemistry will be considered in exceptional cases.

### **Orientation Examinations**

Students coming from outside Canada or the United States must write orientation examinations at approximately the third-year university level. Each student will be informed of this requirement upon admission. The examinations will be given in the first week of the term in September and January. Students can choose from any three examination modules in: organic, physical, inorganic/analytical and biochemistry.

In examination areas where the student shows unsatisfactory performance or deficiency, the Graduate Supervisor will assign undergraduate-level remedial courses. To be eligible to continue in the graduate program, the student must achieve a minimum grade of A- in each remedial course.

### **Chemistry (CHEM) Courses**

#### **CHEM 5001 [0.25 credit] (CHM 8301)**

##### **Analytical Mass Spectrometry**

The principles of ion sources and mass spectrometers and their applications to problems in chemistry and biochemistry. Introduction to the chemistry of gaseous ions. Ion optics. Special emphasis on interpreting mass spectra.

#### **CHEM 5002 [0.25 credit] (CHM 8301)**

##### **Multinuclear Magnetic Resonance Spectroscopy**

Principles of Nuclear Magnetic Resonance (NMR). NMR parameters studied: chemical shift, spin-spin coupling, electric quadrupole coupling, spin-spin, spin-lattice relaxation rates. NMR and the periodic table. Dynamic NMR. Applications in chemistry and biochemistry. The Fourier Transform technique. Pulse sequences. Basic principles/applications of two-dimensional NMR.

#### **CHEM 5003 [0.25 credit] (CHM 8325)**

##### **Solid State NMR Spectroscopy**

Brief introduction to solid state NMR spectroscopy. Topics include dipolar coupling interactions, chemical shielding anisotropy, the quadrupolar interaction and averaging techniques such as magic angle spinning.

#### **CHEM 5004 [0.25 credit] (CHM 8326)**

##### **NMR Spectroscopy**

Advanced NMR techniques for both proton and carbon spectra, various decoupling and related experiments. Interpretation of NIOSY, COSY and related data.

#### **CHEM 5005 [0.25 credit] (CHM 8327)**

##### **Physical Organic Chemistry**

Hammett functions, transition state energies, stereochemistry of organic compounds, and mechanisms of organic reactions and their determination.

#### **CHEM 5007 [0.25 credit] (CHM 8310)**

##### **Introduction to Photochemistry**

Basic principles of photochemistry including selection rules, energy transfer processes and the properties of excited state reactions. Lasers and their applications to measurements of the dynamics of elementary reactions.

#### **CHEM 5010 [0.5 credit]**

##### **Bio-Organic Chemistry**

Chemical and biosynthetic methods applied to the major classes of biomolecules and their derivatives, including: carbohydrates, amino acids, peptides, proteins, nucleic acids, lipids, terpenes, heterocycles and natural products. Reactions and mechanisms that contribute to their biological activities.

Also offered at the undergraduate level, with different requirements, as CHEM 4207, for which additional credit is precluded.

#### **CHEM 5102 [0.25 credit] (CHM 8346)**

##### **Supercritical Fluids**

Fundamental and practical aspects of the uses of supercritical fluids in the chemistry laboratory. Thermodynamic treatment of high pressure multicomponent phase equilibria, transport properties, solubilities, supercritical fluid extraction and chromatography for analytical purposes, reactions in supercritical fluids, equipment considerations, new developments.

Includes: Experiential Learning Activity

#### **CHEM 5108 [0.5 credit] (CHM 8302)**

##### **Surface Chemistry and Nanostructures**

Surface structure, thermodynamics and kinetics, specifically regarding adsorption/desorption and high vacuum models. Nanoscale structures and their formation, reactivity and characterization. Thin films, carbon nanotubes, self-assembled monolayers and supramolecular aggregates.

Also offered at the undergraduate level, with different requirements, as CHEM 4103, for which additional credit is precluded.

#### **CHEM 5109 [0.5 credit] (CHM 8302)**

##### **Advanced Applications in Mass Spectrometry**

Detailed breakdown of the physical, electrical and chemical operation of mass spectrometers. Applications in MS ranging from the analysis of small molecules to large biological macromolecules. Descriptions of the use of mass spectrometry in industry as well as commercial opportunities in the field.

Also offered at the undergraduate level, with different requirements, as CHEM 4304, for which additional credit is precluded.

**CHEM 5110 [0.25 credit] (CHM 8176)**  
**Chemistry Education and Chemistry Education Research**

Chemistry education including theories of learning, aligning intended outcomes with course activities and assessment, and troublesome areas of learning and teaching in chemistry. Key educational research areas are addressed, including types evidence, research methods, and central publications.

**CHEM 5111 [0.25 credit] (CHM 8358)**  
**Advanced Topics in Biomolecular Sciences**

Topics of current interest in biomolecular sciences and biological chemistry. Variable content from year to year.

**CHEM 5112 [0.25 credit] (CHM 8359)**  
**Advanced Topics in Materials Chemistry**

Topics of current interest in materials chemistry. Variable content from year to year.

**CHEM 5113 [0.25 credit] (CHM 8165)**  
**Stereoselective Synthesis**

Fundamentals of stereoselective synthesis and catalysis, including conformational analysis, substrate and catalyst control. Includes the use of allylic, chiral auxiliaries, directed reactions and chiral catalysts.

**CHEM 5114 [0.25 credit] (CHM 8173)**  
**Introduction to Molecular Simulation and Statistical Mechanics (Part A)**

Modern molecular simulation techniques including classical molecular dynamics and Monte Carlo simulations with the necessary statistical mechanics required to understand and interpret the results. Introduction to modern scientific computing environments via the Linux operating system.

**CHEM 5115 [0.25 credit] (CHM 8175)**  
**Introduction to Molecular Simulation and Statistical Mechanics (Part B)**

Modern molecular simulation techniques including classical molecular dynamics and Monte Carlo simulations with the necessary statistical mechanics required to understand and interpret the results. Introduction to modern scientific computing environments via the Linux operating system.  
Prerequisite(s): CHEM 5114.

**CHEM 5116 [0.25 credit] (CHM 8360)**  
**Characterization Methods and Applications of Advanced Materials**

Physico-chemical techniques including thermal analysis, optical spectroscopy, electrochemistry, X-ray and electron diffraction, electron microscopy, electron spectroscopies, magnetic resonance, and general instrumental methods. Applications may include: field effect transistors, photovoltaics, light emitting devices, batteries and fuel cells.

**CHEM 5117 [0.25 credit] (CHM 8361)**  
**Chemical Biology (Part A)**

Chemical Biology of modern molecular science with applications to understanding biological mechanisms. Chemical and genetically encoded probes for genomics, proteomics, metabolomics as well as biorthogonal chemistry, chemical genetics and expanded genetic codes and alphabets in the context of understanding and engineering living systems.

**CHEM 5118 [0.25 credit] (CHM 8363)**  
**Chemical Biology (Part B)**

Chemical Biology of modern molecular science with applications to understanding biological mechanisms. Chemical and genetically encoded probes for genomics, proteomics, metabolomics as well as biorthogonal chemistry, chemical genetics and expanded genetic codes and alphabets in the context of understanding and engineering living systems.  
Prerequisite(s): CHEM 5117.

**CHEM 5119 [0.25 credit] (CHM 8362)**  
**Molecular Magnetism I**

Introduction to the principals (Molecular Magnetism I) and advanced characterization of paramagnetic molecules (Molecular Magnetism II). Emphasis will be made on structure-property relationship. This course will contain variable content from year to year by discussing recent progress on molecular magnetism.

**CHEM 5120 [0.25 credit] (CHM 8330)**  
**Heterocyclic Chemistry**

Properties of heterocycles. Synthesis and reactivity of heterocyclic systems, with examples relevant to the synthesis of pharmaceuticals and natural products. Includes metal-catalyzed reactions.

**CHEM 5121 [0.25 credit] (CHM 8364)**  
**Molecular Magnetism II**

Introduction to the principals (Molecular Magnetism I) and advanced characterization of paramagnetic molecules (Molecular Magnetism II). Emphasis will be made on structure-property relationship. This course will contain variable content from year to year by discussing recent progress on molecular magnetism.

**CHEM 5122 [0.5 credit]****Advanced Topics in Computational Chemistry**

Computer simulation of materials, liquids, and biomolecules in the framework of intermolecular forces and statistical thermodynamics. Introduction to chemoinformatics and machine learning methods in chemistry.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as CHEM 4101, for which additional credit is precluded.

**CHEM 5202 [0.25 credit] (CHM 8323)****Chemistry of the Main Group Elements**

Fundamental and applied aspects of main group element chemistry. Topics may include non-metal chemistry, main group organometallic chemistry, application of main group element compounds to solid state synthesis (e.g. CVD and/or sol gel processes), uses of main group element compounds in synthesis.

**CHEM 5206 [0.5 credit] (CHM 8302)****Physical Methods of Nanotechnology**

An overview of methods used in nanotechnology. Principles of scanning probe techniques ranging from surface physics to biology. State of the art methods to create nanostructures for future applications in areas such as nanolithography, nanoelectronics, nano-optics, data storage and bio-analytical nanosystems.

**CHEM 5207 [0.25 credit] (CHM 8302)****Macromolecular Nanotechnology**

Fundamentals of synthetic macromolecules related to nanoscale phenomena. Challenges and opportunities associated with polymers on the nanoscale. Topics include molecular recognition, self-assembled nanostructures, functional nanomaterials, amphiphilic architectures, nanocomposites, and nanomachines. Applications to sensing, drug delivery, and polymer based devices. Also offered at the undergraduate level, with different requirements, as CHEM 4201, for which additional credit is precluded.

**CHEM 5208 [0.25 credit] (CHM 8302)****Bio Macromolecular Nanotechnology**

Fundamentals of biological macromolecules related to nanoscale phenomena. Challenges and opportunities associated with natural polymers on the nanoscale. Topics include molecular recognition, self-assembled nanostructures, scaffolds and templates, functional nanomaterials, amphiphilic architectures, nanocomposites, and nanomachines. Applications to sensing, biomaterials, drug delivery, and devices.

Also offered at the undergraduate level, with different requirements, as CHEM 4201, for which additional credit is precluded.

**CHEM 5300 [0.25 credit] (CHM 8331)****Physical Chemistry of Biological Macromolecules**

How the application of physical techniques, normally applied to small molecules, can be used to study macromolecular structure and function of DNA and proteins. Examples of applications to include kinetics, electrochemistry, equilibria phenomena (thermodynamics).

**CHEM 5304 [0.25 credit] (CHM 8349)****Free Radicals in Chemistry and Biology**

Oxidative stress induced by free radicals plays a significant role in fatal and chronic diseases. The chemistry of bio-radicals will be described and related to pathobiological processes such as lipid peroxidation and atherosclerosis, protein nitration and cross linking, and DNA scission.

**CHEM 5306 [0.25 credit] (CHM 8338)****Unimolecular Reaction Dynamics: Experiment and Theory**

Theoretical models that have been developed for the understanding of unimolecular reactions; statistical theories such as RRKM theory. Experimental techniques for exploring the kinetics and mechanism of unimolecular reactions, including mass spectrometry, coincidence spectroscopy and ZEKE spectroscopy.

**CHEM 5406 [0.5 credit] (CHM 8164)****Organic Polymer Chemistry**

Basic principles of industrial and synthetic polymers. Polymerization and polymer characterization. Topics to cover some important polymers with emphasis on synthesis, commodity plastics, engineering thermoplastics and specialty polymers.

Prerequisite(s): CHEM 3201 and CHEM 3202 and/or CHEM 4203 or the equivalent. Students should have a basic knowledge of organic reaction mechanisms and stereochemistry.

Also offered at the undergraduate level, with different requirements, as CHEM 4204, for which additional credit is precluded.

**CHEM 5407 [0.5 credit] (CHM 8134)****Spectroscopy for Organic Chemists**

Use of NMR spectroscopy in the elucidation of organic structures, interpretation of  $^1\text{H}$ ,  $^{13}\text{C}$  and  $^{19}\text{F}$  NMR. Use of NMR in determining relative and absolute stereochemistry. Two-dimensional NMR.

Also offered at the undergraduate level, with different requirements, as CHEM 4202, for which additional credit is precluded.

**CHEM 5500 [0.25 credit] (CHM 8348)****Analytical Instrumentation**

Principles of modern electronics, devices and instruments. Measurement of photonic and electrochemical signals. Conditioning of signals for feedback control and microcomputer interfacing. Computational data analysis techniques such as simplex optimization. Applications in chemical analysis include amperometric detector for capillary electrophoresis, and surface plasmon resonance immunosensor.

**CHEM 5501 [0.25 credit] (CHM 8352)****Analytical Approach to Chemical Problems**

Case study of analytical approach to various chemical problems in agricultural, biochemical, environmental, food processing, industrial, pharmaceutical and material sciences. Analytical methods include capillary electrophoresis, chemiluminescence, Fourier transform infrared spectroscopy, inductively coupled plasma emission spectroscopy, mass spectrometry, biochemical sensors, and fibre optics for remote sensing. Includes: Experiential Learning Activity

**CHEM 5600 [0.25 credit] (CHM 8323)****Quantum Mechanical Methods - Theory**

A course dealing with the theory behind quantum mechanical methods (HF, MP2, CI, DFT).

**CHEM 5606 [0.5 credit] (CHM 5606)****Environmental Chemistry and Toxicology**

Overview of environmental chemistry and toxicology principles including chemical sources, fate, and effects in the environment. Examining organic reactions occurring in abiotic environments and biological systems, study aspects of toxicant disposition and biotransformation. Emphasis on contemporary problems in human health and the environment. Also offered at the undergraduate level, with different requirements, as CHEM 4305, for which additional credit is precluded.

**CHEM 5607 [0.5 credit]****Advanced Topics in Analytical Chemistry I**

Analytical chemistry of trace and ultratrace elements/compounds. Special requirements for quantitative determination by various instrumental methods. Control of contamination and blanks. Analytical method development to improve selectivity, sensitivity and detection limit. Strength and limitations of each instrument in regard to optimization of all operating parameters. Also offered at the undergraduate level, with different requirements, as CHEM 4301, for which additional credit is precluded.

**CHEM 5705 [0.5 credit] (CHM 9109)****Ecotoxicology**

Selected topics and advances in ecotoxicology with emphasis on the biological effects of contaminants. The potential for biotic perturbation resulting from chronic and acute exposure of ecosystems to selected toxicants will be covered along with methods of pesticide, herbicide and pollutant residue analysis. Also listed as BIOL 6403.

**CHEM 5708 [0.5 credit] (CHM 8156)****Principles of Toxicology**

Basic theorems of toxicology with examples of current research problems. Toxic risk is defined as the product of intensive hazard and research problems. Each factor is assessed in scientific and social contexts and illustrated with many types of experimental material. Also listed as BIOL 6402 [BIO 9101].

**CHEM 5709 [0.5 credit] (CHM 8157)****Chemical Toxicology**

Introduction to modeling chemical hazards and exposures at the cellular level. The properties of toxic substances are compared to the responses of enzymatic systems. These interactions are defined as Quantitative Structure-Activity Relationships and used to interpret hazardous materials under regulations such as WHMIS. Also listed as BIOL 5709 [BIO 8113]. Prerequisite(s): BIOL 6402/CHEM 5708 (BIO 9101/CHM 8156).

**CHEM 5800 [0.5 credit]****Seminar in Biochemistry**

A graduate seminar on current topics in the field of Biochemistry. This course introduces the seminar format and involves student, faculty and invited seminar speakers. The student will present a seminar and submit a report on a current topic in Biochemistry. Includes: Experiential Learning Activity Also listed as BIOL 5002.

**CHEM 5802 [0.0 credit] (CHM 8257S)****Seminar II**

Students are required to present a seminar on their Ph.D. research topic in their research program. In addition, students are required to attend the seminars of their fellow classmates and actively participate in the discussion following the seminar. Includes: Experiential Learning Activity Also listed as FOOD 5802.

**CHEM 5804 [0.5 credit]****Modern Scientific Communication**

Communication and other skills useful for chemistry graduates. Effective manuscript writing, creating graphics, CV development, networking, science communication, use of social media, outreach, EDI considerations.

Also listed as FOOD 5804.

Precludes additional credit for CHEM 5801 (no longer offered), FOOD 5801 (no longer offered).

**CHEM 5805 [0.5 credit] (CHM 8167)****Seminar in Toxicology**

This course introduces the seminar format and involves student, faculty and invited seminar speakers. The student will present a seminar and submit a report on a current topic in toxicology.

Includes: Experiential Learning Activity

Also listed as BIOL 6405.

**CHEM 5806 [0.5 credit]****Advances in Applied Biochemistry**

A practical hands-on course in the field of Biochemistry. This course is run in a laboratory and will train students in highly specialized technique(s) in Biochemistry. The students will run experiments, gather data, assess and analyze the results and present the findings as a seminar.

Includes: Experiential Learning Activity

Also listed as BIOL 5004.

**CHEM 5810 [0.5 credit]****Seminar**

Principles and practice of oral scientific communication for scientific and non-scientific audiences. Students are required to present short seminars geared towards a general audience (in the style of Three-minute thesis (3MT) and/or TedTalk) as well as a research seminar geared towards a scientific audience.

Also listed as FOOD 5810.

Precludes additional credit for CHEM 5801 (no longer offered), FOOD 5801 (no longer offered).

**CHEM 5900 [0.5 credit] (CHM 8158)****Directed Special Studies**

Under the direction of an approved member of Faculty, the student will undertake advanced study of a field of chemistry unrelated to their thesis topic. Approval of the Associate Chair, Graduate and Postdoctoral Affairs Chemistry is required and will only be granted under unusual conditions.

**CHEM 5901 [0.25 credit] (CHM 8304)****Advanced Topics in Organic Chemistry**

Topics of current interest in organic chemistry. The content of this course may vary from year to year.

**CHEM 5902 [0.25 credit] (CHM 8302)****Advanced Topics in Inorganic Chemistry**

Topics of current interest inorganic chemistry. The content of this course may vary from year to year.

**CHEM 5903 [0.25 credit] (CHM 8309)****Advanced Topics in Physical/Theoretical Chemistry**

Topics of current interest in physical/theoretical chemistry. The content of this course may vary from year to year.

**CHEM 5904 [0.5 credit] (CHM 8104)****Scientific Data Processing and Evaluation**

Optimization of scientific measurements, calibration, uni-variate and multi-variate analysis of scientific data, "intelligent" spreadsheets for scientific data processing and presentation, noise reduction using spreadsheets, correction for signal drifts; examples from chemistry, spectroscopy and other scientific disciplines.

Prerequisite(s): CHEM 4301, or permission from the Department.

Also offered at the undergraduate level, with different requirements, as CHEM 4303, for which additional credit is precluded.

**CHEM 5905 [0.5 credit] (CHM 5105)****Radiochemistry**

A study of nuclear stability and decay; chemical studies of nuclear phenomena. Applications of radioactivity.

Prerequisite(s): permission of the Department.

Also offered at the undergraduate level, with different requirements, as CHEM 4502, for which additional credit is precluded.

**CHEM 5909 [3.0 credits]****M.Sc. Thesis**

Includes: Experiential Learning Activity

**CHEM 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

**Food Science (FOOD) Courses****FOOD 5100 [0.5 credit]****Advanced Food Processing and Technology**

Major techniques used in food processing and preservation of raw agricultural materials. Targeted food groups include dairy, cereal grains and oilseeds.

**FOOD 5101 [0.5 credit]****Advanced Nutrition and Metabolism**

Metabolism of macronutrients in the human body. Detailed catabolic and anabolic reactions of carbohydrates, lipids and proteins. Regulatory control points in healthy and diseased states. Discussion of the literature pertaining to nutrition, metabolism and disease. Also offered at the undergraduate level, with different requirements, as FOOD 4201, for which additional credit is precluded.

**FOOD 5102 [0.5 credit]****Food Biotechnology**

Developments in biotechnology related to food production and quality. Traditional food biotechnology and novel biotechnological methods related to the production of food; the use of traditional food crops in other bio-industries. Aspects of microbiology and genetic engineering.

**FOOD 5103 [0.5 credit]****Cellular Redox in Health and Disease**

Crucial interactions of free radicals with biomolecules in living organisms. Procedures for detecting cellular and DNA damage, lipid and protein oxidation products; the link between oxidative stress and chronic diseases.

**FOOD 5104 [0.5 credit]****Theory and Principles of Food Quality and Control**

Sampling plans and statistical methods. Physical, chemical, biological and microbiological tests in quality control as it relates to food safety and regulation. Also offered at the undergraduate level, with different requirements, as FOOD 4001, for which additional credit is precluded.

**FOOD 5105 [0.5 credit]****Functional Foods and Natural Health Products**

Bioactive components of functional foods and natural health products, for improvement of health and nutrition. Sources and chemistry of bioactives, mechanisms of actions, process technology, efficacy and safety. Role of research and development in industry in commercialization of new products. Also offered at the undergraduate level, with different requirements, as FOOD 4203, for which additional credit is precluded.

**FOOD 5802 [0.0 credit]****Seminar II**

Students are required to present a seminar on their Ph.D. research topic in their research program. In addition, students are required to attend the seminars of their fellow classmates and actively participate in the discussion following the seminar.

Includes: Experiential Learning Activity

Also listed as CHEM 5802.

Prerequisite(s): enrolment in the Ph.D. program.

**FOOD 5804 [0.5 credit]****Modern Scientific Communication**

A course on communication and other skills useful for chemistry graduates. Effective manuscript writing, creating graphics, CV development, networking, science communication, use of social media, outreach, EDI considerations.

Also listed as CHEM 5804.

Precludes additional credit for CHEM 5801 (no longer offered), FOOD 5801 (no longer offered).

**FOOD 5810 [0.5 credit]****Seminar**

Explore the principles and practice of oral scientific communication for scientific and non-scientific audiences. Students are required to present short seminars geared towards a general audience (in the style of Three-minute thesis(3MT) and/or TedTalk) as well as a research seminar geared towards a scientific audience.

Also listed as CHEM 5810.

Precludes additional credit for CHEM 5801 (no longer offered), FOOD 5801 (no longer offered).

Seminar

**FOOD 5909 [3.0 credits]****M.Sc. Thesis**

Includes: Experiential Learning Activity

**FOOD 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Civil Engineering

This section presents the requirements for programs in:

- **M.A.Sc. Civil Engineering**
- **M.A.Sc. Civil Engineering with Collaborative Specialization in Climate Change**
- **M. Eng. Civil Engineering**
- **M.Eng. Civil Engineering with Collaborative Specialization in Climate Change**
- **Ph.D. Civil Engineering**

### Program Requirements

Study at the master's level can be pursued through either a thesis leading to a M.A.Sc., a project option leading to a M.Eng., or a course work option leading to a M.Eng. Requirements are stated in terms of Carleton University credits.

#### M.A.Sc. Civil Engineering (5.0 credits)

##### Requirements - Master's degree by thesis (5.0 credits)

- 1. 2.5 credits in** courses listed below (other courses may be taken with prior departmental approval) **2.5**
- 2. 2.5 credits in:** **2.5**  
CIVE 5909 [2.5] M.A.Sc. Thesis
- Participation in the graduate student seminar series:  
CIVE 5901 [0.0] Master's Seminar
- Successful oral defence of the thesis

**Note: no more than 0.5 credit may be taken from the following: CIVE 5103, CIVE 5200, CIVE 5305**

**Total Credits 5.0**

#### M.A.Sc. Civil Engineering with Collaborative Specialization in Climate Change (6.0 credits)

##### Requirements:

- 1. 1.0 credit in:** **1.0**  
CLIM 5000 [1.0] Climate Collaboration
- 2. 0.0 credit in:** **0.0**  
CLIM 5800 [0.0] Climate Seminar Series
- 3. 2.5 credits in** courses listed below (other courses may be taken with prior departmental approval) **2.5**
- 4. 0.0 credit in:**  
CIVE 5901 [0.0] Master's Seminar
- 5. 2.5 credits in:** **2.5**  
CIVE 5909 [2.5] M.A.Sc. Thesis (in the specialization)

**Note: no more than 0.5 credit may be taken from the following: CIVE 5103, CIVE 5200, CIVE 5305**

**Total Credits 6.0**

#### M. Eng. Civil Engineering (5.0 credits)

##### Requirements - Master's degree by project (5.0 credits)

- 1. 4.0 credits in** courses listed below (other courses may be taken with prior departmental approval) **4.0**
- 2. 1.0 credit in:** **1.0**  
CIVE 5900 [1.0] Civil Engineering Project

**Note: no more than 1.0 credit may be taken from the following: CIVE 5103, CIVE 5200, CIVE 5305**

**Total Credits 5.0**

##### Requirements - Master's degree by course work (5.0 credits)

- 1. 5.0 credits in** courses listed below **5.0**

#### M.Eng. Civil Engineering with Collaborative Specialization in Climate Change (6.0 credits)

##### Requirements - Project pathway:

- 1. 1.0 credit in:** **1.0**  
CLIM 5000 [1.0] Climate Collaboration
- 2. 0.0 credit in:**  
CLIM 5800 [0.0] Climate Seminar Series
- 3. 4.0 credits in** courses listed below (other courses may be taken with prior departmental approval) **4.0**
- 4. 1.0 credit in:** **1.0**  
CIVE 5900 [1.0] Civil Engineering Project (in the specialization)

**Note: no more than 1.0 credit may be taken from the following: CIVE 5103, CIVE 5200, CIVE 5305**

**Total Credits 6.0**

##### Requirements - Coursework pathway:

- 1. 1.0 credit in:** **1.0**  
CLIM 5000 [1.0] Climate Collaboration
- 2. 0.0 credit in:**  
CLIM 5800 [0.0] Climate Seminar Series
- 3. 4.0 credits in** courses listed below (other courses may be taken with prior departmental approval) **4.0**
- 4. 1.0 credit from:** **1.0**  
ENVE 5105 [0.5] Atmospheric Aerosols  
ENVE 5200 [0.5] Climate Change and Engineering  
ENVE 5201 [0.5] Geo-Environmental Engineering  
ENVE 5205 [0.5] Sludge Treatment and Disposal  
ENVJ 5908 [0.5] Anaerobic Digestion  
ENVJ 5212 [0.5] Climate Change Impacts on Water Resources

or approved Special Topics in the area of climate change

**Total Credits 6.0**

#### Ph.D. Civil Engineering (2.0 credits)

##### Requirements:

- 1. 2.0 credits in** courses **2.0**
- Participation in the graduate student seminar series: **0.0**  
CIVE 6901 [0.0] Ph.D. Seminar
- Successful completion of written and oral comprehensive examinations in subject areas determined by the student's advisory committee: **0.0**  
CIVE 6902 [0.0] Ph.D. Comprehensive Examination
- Successful completion of a thesis proposal examination **0.0**  
CIVE 6903 [0.0] Ph.D. Proposal
- 5. 0.0 credits in:** **0.0**  
CIVE 6909 [0.0] Ph.D. Thesis
- Successful oral defence of the thesis. The examination board for all theses will include an external examiner, and, when possible, professors from both departments. **0.0**

**Note: no more than 0.5 credit may be taken from the following: CIVE 5103, CIVE 5200, CIVE 5305**

**Total Credits** **2.0**

#### Note

- Subject to approval of their advisory committee and the Associate Chair (Graduate Studies) of the department, a Ph.D. student may take, or be required to take, courses in other disciplines.

#### Graduate Courses

In all programs, the student may choose graduate courses from either university with the approval of the adviser or the advisory committee. Graduate courses are listed below, grouped by subject area. Course descriptions may be found in the departmental section of the calendar concerned. All courses are of one term duration. The codes given in parentheses are those used by the University of Ottawa. Courses beginning with "CIVE" and "ENVE" are offered at Carleton University and those beginning with "CIVJ" and "ENVJ" are offered at the University of Ottawa. Not all courses listed are necessarily given during one academic year. Courses taken outside the Institute (i.e., course codes other than CIVE, ENVE, CIVJ, or ENVJ) will not count towards the degree requirements. However, thesis students may take courses outside the Institute if prior approval is obtained from the thesis supervisor or the advisory committee, and the program's Associate Chair (Graduate studies). In all programs, at least one-half of the course work must be taken from the Institute regardless of the number of courses completed at another University (applicable to transfer students). Advanced standing (i.e., credit for courses taken elsewhere) is only granted at the time of admission.

#### Geotechnical Engineering

CIVE 5209 (CVG 7100) Geotechnical Case Studies

CIVE 5300 (CVG 7101) Advanced Soil Mechanics

CIVE 5500 (CVG 7104) Earth Retaining Structures

CIVE 5501 (CVG 7105) Advanced Foundation Engineering

CIVE 5503 (CVG 7107) Numerical Methods in Geomechanics

CIVE 5505 (CVG 7109) Geotechnical Earthquake Engineering

CIVE 5506 Fundamentals of Geomechanics

CIVE 5800 (CVG 7305) Topics in Geotechnique

CIVE 5801 (CVG 7306) Topics in Geotechnique

CIVE 5802 (CVG 7307) Topics in Geotechnique

CIVE 5803 (CVG 7308) Topics in Geotechnique

CIVE 5804 (CVG 7309) Topics in Geotechnique

CIVJ 5105 (CVG 5175) Numerical Methods for Geotechnical Engineering

CIVJ 5106 (CVG 5161) Mechanics of Unsaturated Soils

CIVJ 5109 (CVG 5314) Geotechnical Hazards

#### Structural Engineering

CIVE 5101 (CVG 7120) Solid Mechanics

CIVE 5103 (CVG 7122) Finite Element Analysis 1

CIVE 5104 (CVG 7123) Earthquake Engineering and Analysis

CIVE 5105 (CVG 7124) Finite Element Analysis 2

CIVE 5106 (CVG 7137) Dynamics of Structures

CIVE 5108 (CVG 7181) Performance-Based Earthquake Engineering

CIVE 5109 Estimation and Identification in Dynamics using Data

CIVE 5200 (CVG 7138) Masonry Behaviour and Design

CIVE 5202 Structural Assessment of Historic Buildings

CIVE 5204 (CVG 7126) Advanced Steel Structures

CIVE 5206 (CVG 7128) Prestressed Concrete

CIVE 5208 (CVG 7130) Advanced Mechanics of Reinforced Concrete

CIVE 5210 Advanced Computational Modeling Strategies of Historic Buildings

CIVE 5507 (CVG 7184) Blast Load Effects on Structures

CIVE 5603 Advanced Building Characterization, Conservation and Rehabilitation

CIVE 5604 Probability, Statistics, Stochastic Processes and Statistical Inference in Engineering

CIVE 5705 (CVG 7300) Topics in Structures

CIVE 5706 (CVG 7301) Topics in Structures

CIVE 5707 (CVG 7302) Topics in Structures

CIVE 5708 (CVG 7303) Topics in Structures

CIVE 5709 (CVG 7304) Topics in Structures

CIVJ 5101 (CVG 5101) Construction Equipment Management

CIVJ 5151 (CVG 5151) Advanced Timber Design

CIVJ 5201 (CVG 5142) Advanced Structural Dynamics

CIVJ 5202 (CVG 5143) Advanced Structural Steel Design

CIVJ 5203 (CVG 5145) Theory of Elasticity

CIVJ 5204 (CVG 5147) Theory of Plates and Shells

CIVJ 5206 (CVG 5150)	Advanced Concrete Technology
CIVJ 5209 (CVG 5153)	Wind Engineering
CIVJ 5300 (CVG 5144)	Advanced Reinforced Concrete
CIVJ 5302 (CVG 5146)	Numerical Methods of Structural Analysis
CIVJ 5305 (CVG 5148)	Prestressed Concrete Design
CIVJ 5304 (CVG 5149)	Structural Stability
CIVJ 5306 (CVG 5155)	Earthquake Engineering
CIVJ 5301 (CVG 5156)	Finite Element Methods I
CIVJ 5303 (CVG 5157)	Finite Element Methods II
CIVJ 5307 (CVG 5158)	Elements of Bridge Engineering
CIVJ 5308 (CVG 5154)	Random Vibrations
CIVJ 5309 (CVG 5159)	Long Span Structures
CIVJ 5310 (CVG 5311)	Bridge Design
CIVJ 5311 (CVG 5312)	Durability of Concrete Structures
CIVJ 5312 (CVG 5313)	Seismic Analysis and Design of Concrete Structures

### Fire Safety Engineering

CIVE 5609 (CVG 7170)	Fundamentals of Fire Safety Engineering
CIVE 5610 (CVG 7171)	Fire Dynamics I
CIVE 5611 (CVG 7173)	People in Fires
CIVE 5612 (CVG 7174)	Fire Modeling
CIVE 5613 (CVG 7172)	Fire Dynamics II
CIVE 5614 (CVG 7175)	Design for Fire Resistance
CIVE 5615 (CVG 5320)	Fire Behaviour of Materials
CIVE 5616	Wood Structures and Fire
CIVE 5617	Practical Applications of Fire Protection
CIVE 5810 (CVG 7185)	Topics in Fire Safety
CIVE 5811	Topics in Fire Safety
CIVE 5812	Topics in Fire Safety
CIVE 5813	Topics in Fire Safety
CIVE 5814	Topics in Fire Safety

### Transportation Engineering

CIVE 5303 (CVG 7103)	Pavements and Materials
CIVE 5305 (CVG 7151)	Traffic Engineering

CIVE 5307 (CVG 7153)	Urban Transportation
CIVE 5308 (CVG 7154)	Highway Geometric Design
CIVE 5310	Road Safety Analysis
CIVE 5311	Advanced Pavement Engineering and Management
CIVE 5403 (CVG 7158)	Airport Planning
CIVE 5805 (CVG 7310)	Topics in Transportation
CIVE 5806 (CVG 7311)	Topics in Transportation
CIVE 5807 (CVG 7312)	Topics in Transportation
CIVE 5808 (CVG 7313)	Topics in Transportation
CIVE 5809 (CVG 7314)	Topics in Transportation

### Water Resources Engineering

CIVJ 5501 (CVG 5111)	Hydraulic Structures
CIVJ 5502 (CVG 5112)	Numerical Modelling in Water Resources
CIVJ 5605 (CVG 5124)	Coastal Engineering
CIVJ 5182 (CVG 5182)	Water Resources Management
CIVJ 5212 (CVG 5212)	Climate Change Impacts on Water Resources
CIVJ 5183 (CVG 5183)	Mixing and Transport in Water Bodies
CIVJ 5503 (CVG 5160)	Sediment Transport
CIVJ 5504 (CVG 5162)	River Hydraulics

### Environmental Engineering

ENVE 5004 (EVG 7144)	Advanced Wastewater Treatment
ENVE 5007 (EVG 7101)	Filtration and Membranes in Water Treatment
ENVE 5101 (EVG 7101)	Air Pollution Control
ENVE 5105 (EVG 7105)	Atmospheric Aerosols
ENVE 5106 (EVG 7106)	Atmospheric Chemical Transport Modelling
ENVE 5107 (EVG 7107)	Radiative Transfer and Remote Sensing
ENVE 5200 (EVG 7200)	Climate Change and Engineering
ENVE 5201 (EVG 7201)	Geo-Environmental Engineering
ENVE 5204 (EVG 7134)	Resource Industry Waste Management
ENVE 5205 (EVG 7132)	Sludge Treatment and Disposal
ENVE 5206 (EVG 7206)	Energy and Resource Recovery from Waste

ENVE 5207 (EVG 7207)	Energy and the Critical Zone
ENVE 5301 (EVG 7301)	Contaminant Hydrogeology
ENVE 5303 (EVG 7303)	Multiphase Flow in Soils
ENVE 5305	Stormwater Management and Low Impact Development
ENVE 5701 (EVG 7001)	Topics in Environmental Engineering
ENVE 5702 (EVG 7002)	Topics in Environmental Engineering
ENVE 5703 (EVG 7003)	Topics in Environmental Engineering
ENVE 5704 (EVG 7004)	Topics in Environmental Engineering
ENVE 5705 (EVG 7005)	Topics in Environmental Engineering
ENVJ 5001 (EVG 5001)	Biofilm Processes in Wastewater Treatment
ENVJ 5182 (EVG 5182)	Water Resources Management
ENVJ 5301 (EVG 5301)	Soil and Water Conservation Engineering
ENVJ 5302 (EVG 5302)	Decentralized Wastewater Management
ENVJ 5333 (EVG 5333)	Research Methodology
ENVJ 5700 (EVG 5139)	Environmental Assessment of Civil Engineering Projects
ENVJ 5900 (EVG 5130)	Wastewater Treatment Process Design
ENVJ 5901 (EVG 5132)	Unit Operations of Water Treatment
ENVJ 5902 (EVG 5138)	Advanced Water Treatment
ENVJ 5905 (EVG 5137)	Water and Wastewater Treatment Process Analysis
ENVJ 5906 (EVG 5133)	Solid Waste Management
ENVJ 5907 (EVG 5134)	Chemistry for Environmental Engineering
ENVJ 5908 (EVG 5179)	Anaerobic Digestion
ENVJ 6300 (EVG 6300)	Special Topics in Environmental Engineering
ENVJ 6301 (EVG 6301)	Special Topics in Environmental Engineering
ENVJ 6302 (EVG 6302)	Special Topics in Environmental Engineering
ENVJ 6303 (EVG 6303)	Special Topics in Environmental Engineering
ENVJ 6304 (EVG 6304)	Special Topics in Environmental Engineering
CIVJ 5181 (CVG 5181)	Decentralized Wastewater Management

### Studies and Seminars

CIVE 5901 (CVG 7314)	Master's Seminar
CIVE 5906 (CVG 6108)	Directed Studies 1

CIVE 6901	Ph.D. Seminar
CIVE 6906 (CVG 6109)	Directed Studies 2
CIVJ 5333 (CVG 5333)	Research Methodology
CIVJ 6000 (CVG 6300)	Special Topics in Civil Engineering
CIVJ 6001 (CVG 6301)	Special Topics in Civil Engineering
CIVJ 6002 (CVG 6302)	Special Topics in Civil Engineering
CIVJ 6003 (CVG 6303)	Special Topics in Civil Engineering
CIVJ 6004 (CVG 6304)	Special Topics in Civil Engineering
CIVJ 6005 (CVG 6305)	Special Topics in Civil Engineering
CIVJ 6006 (CVG 6306)	Special Topics in Civil Engineering
CIVJ 6007 (CVG 6307)	Special Topics in Civil Engineering
CIVJ 6008 (CVG 6308)	Special Topics in Civil Engineering
CIVJ 6009 (CVG 6309)	Special Topics in Civil Engineering
CIVJ 6010 (CVG 6310)	Special Topics in Civil Engineering
CIVJ 6011 (CVG 6311)	Special Topics in Civil Engineering
CIVJ 6012 (CVG 6312)	Special Topics in Civil Engineering
CIVJ 6013 (CVG 6313)	Special Topics in Civil Engineering
CIVJ 6014 (CVG 6314)	Special Topics in Civil Engineering
CIVJ 6015 (CVG 6315)	Special Topics in Civil Engineering
CIVJ 6016 (CVG 6316)	Special Topics in Civil Engineering
CIVJ 6017 (CVG 6317)	Special Topics in Civil Engineering
CIVJ 6018 (CVG 6318)	Special Topics in Civil Engineering
CIVJ 6019 (CVG 6019)	Special Topics in Civil Engineering
CIVJ 6020 (CVG 6320)	Special Topics in Civil Engineering

### Projects and Theses

CIVE 5900 (CVG 6000)	Civil Engineering Project
CIVE 5909 (CVG 5909)	M.A.Sc. Thesis
CIVE 6902 (CVG 9998)	Ph.D. Comprehensive Examination
CIVE 6903	Ph.D. Proposal
CIVE 6909 (CVG 9999)	Ph.D. Thesis

## Admission

The normal requirement for admission to a master's program is a bachelor's degree with at least high honours standing in civil engineering.

1. Graduates from engineering programs other than civil engineering, or Honours science programs with a mathematics content equivalent to the civil engineering program will have to take a minimum of four qualifying undergraduate civil engineering courses in their area of graduate specialty.
2. Graduates from other science programs will have to take all the core engineering undergraduate mathematics courses in addition to the requirements specified in (1) above.

The undergraduate courses required will be specified in the Certificate of Admission.

Undergraduate civil engineering courses will not be accepted towards a graduate degree. Graduate students may still be required to take undergraduate courses for credit to fulfil the admission requirements.

No more than one half of the program credit requirements or that stipulated in the regulations of the university in which the student is registered, whichever is less, can be transferred at admission.

### Accelerated Pathway

The accelerated pathway in Civil Engineering is a flexible and individualized plan of graduate study. Students in the final year of Bachelor of Engineering in Civil, Environmental, or Architectural Conservation and Sustainability Engineering with demonstrated excellent aptitude for graduate studies and research may qualify for this option.

Students with a CGPA of 10.0 or higher, going into their final year of undergraduate study, and intending to apply to a Master's degree in Civil Engineering in the following academic year should consult with both the Undergraduate and Graduate Associate Chairs to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses.

Upon approval for the accelerated pathway, students will replace a maximum of 1.0 credit of their engineering electives with 5000 level CIVE or ENVE courses. Students will receive advanced standing for the approved 5000 level courses in which they receive a grade of A- or higher.

## Admission

The normal requirement for admission into the Ph.D. program is a master's degree with thesis in civil engineering. Students who have been admitted to a master's program may be permitted to transfer into the Ph.D. program if they demonstrate:

1. outstanding academic performance by completing at least 2.5 credits of course work with a CGPA of A- or higher, and
2. significant promise for advanced research and the ability to defend their Ph.D. proposal in the first year of their Ph.D. program.

## Regulations

See the General Regulations section of this Calendar.

### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the M.Eng. Civil Engineering (coursework and project pathways) is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## Civil Engineering - Joint (CIVJ) Courses

### CIVJ 5101 [0.5 credit] (CVG 5101)

#### Construction Equipment Management

Fundamentals and basis for design and analysis of construction operations. Equipment used in the construction of heavy civil projects is analyzed and evaluated. Methods for selecting, acquiring, maintaining, and replacing equipment. Simulation and optimization techniques for the optimal selection of equipment.

### CIVJ 5105 [0.5 credit] (CVG 5175)

#### Numerical Methods for Geotechnical Engineering

Non-linear analysis of stresses and deformations using the effective stress concept; analysis of consolidation using the excess pore water pressure concept; flow through porous media; finite element, discrete element and finite difference methods; applications to foundations of structures, retaining walls, dams, tunnels, pipelines.

### CIVJ 5106 [0.5 credit] (CVG 5161)

#### Mechanics of Unsaturated Soils

Introduction to unsaturated soils, phase properties and relations, stress state variables. Measurement & theory of soil suction, capillarity, permeability, shear strength, failure envelope for unsaturated soils, triaxial and direct shear tests, volume change behaviour.

### CIVJ 5109 [0.5 credit] (CVG 5314)

#### Geotechnical Hazards

Assessment, prevention, and mitigation of geotechnical hazards, Natural and man-made geohazards; concepts of hazards, disasters, vulnerability and risks; geotechnical hazards induced by problem soils: fundamentals, assessment, and mitigation; landslide hazards and risk assessment: fundamentals, solutions (prevention, stabilization) for landslides and slope instability.

**CIVJ 5110 [0.5 credit] (CVG 5187)****Rock Mechanics**

Rock exploration, laboratory and in-situ testing, rock mass classification, deformation and strength, failure criteria, stresses in rock, foundations on rock.

**CIVJ 5151 [0.5 credit] (CVG 5151)****Advanced Timber Design**

Characteristic values for timber and engineered wood products, modification factors used in design; combined bending axial loading; design for bi-axial bending; design of curved glued laminated beams, Timber-Concrete Composite (TCC) floor systems; lateral design (light frame, CLT, hybrid structures); advanced connection design.

**CIVJ 5181 [0.5 credit] (CVG 5181)****Decentralized Wastewater Management**

Fundamental principles and practical design applications of decentralized wastewater treatment for domestic and industrial sources. Management of decentralized wastewater systems; Pre-treatment systems; Soil infiltration systems; Advanced onsite technologies, constructed wetlands; Alternative collection systems; Wastewater reuse and septage management. Also listed as ENVJ 5302.

**CIVJ 5182 [0.5 credit] (CVG 5182)****Water Resources Management**

Global water supply and demand, integrated water resources management, modelling and optimization of water resources systems, reservoir management, uncertainty modelling, climate change and water, decision under uncertainty. Also listed as ENVJ 5182.

**CIVJ 5183 [0.5 credit] (CVG 5183)****Mixing and Transport in Water Bodies**

Typical models for selected water resources systems: rivers, lakes, estuaries; water quality parameters, conservative parameters, non-conservative parameters, laminar and turbulent flows, dispersion, pollution sources, modeling, simplified models, dilution models, three-dimensional models, advection-diffusion equation, analytical/numerical solution, non-conservative transport and multi-component systems. Also listed as ENVJ 5183.

**CIVJ 5184 [0.5 credit] (CVG 5184)****Construction Cost Estimating**

General overview of construction cost estimating. Techniques and construction cost estimating process; elements of project cost; conceptual and detailed cost estimation methods; risk assessment and range estimating; work breakdown structure applied in building projects. Computer applications in building construction cost estimating and infrastructure projects.

**CIVJ 5185 [0.5 credit] (CVG 5185)****Construction Life Cycle Analysis**

General overview of analyzing the economics of construction projects by applying the concept of time value of money. Financing strategies for construction projects and profitability analysis; correlation between value engineering, life cycle cost analysis and assessment for construction projects. Breakeven, sensitivity and risk analysis.

**CIVJ 5186 [0.5 credit] (CVG 5186)****Project Information Management**

Topics in contractual relationships between construction project teams. Different type of construction contracts and their application. Preparation of project documents. Evaluation of different types of project organization structure and associated project delivery systems. Bidding strategies. Network analysis using deterministic and stochastic methods for construction-time.

**CIVJ 5188 [0.5 credit] (CVG 5188)****Loads on structures**

Overview of loads on buildings according to Canadian codes and standards. Dead and live loads, snow loads, wind loads, earthquake loads, loads on non-structural components; vibrations. Selected topics in the practical design of building structures.

**CIVJ 5189 [0.5 credit] (CVG5189)****Blast Engineering**

Overview of explosives and blast loads on structural and non-structural infrastructure components; dynamic analysis of elements under blast-induced shock waves and dynamic pressures; elastic and inelastic response; incremental equation of motion and nonlinear analysis; development of resistance functions; pressure-impulse (P-I) diagrams; blast-resistant building design.

**CIVJ 5190 [0.5 credit] (CVG 5190)****Rehabilitation of Concrete Structures**

Durability of concrete bridges and building structures in Canada; assessment and evaluation of damaged concrete structures; repair, rehabilitation and strengthening techniques; applicable design codes and guidelines; monitoring technologies for structures; implications for infrastructure management. Lecture three hours a week

**CIVJ 5191 [0.5 credit] (CVG 5191)****Diagnosis and Prognosis of Concrete Infrastructure**

Condition assessment of concrete infrastructure using experimental (i.e. visual, nondestructive, microscopic and mechanical) and analytical approaches; overview of repair and maintenance techniques according to damage type and extent; Serviceability performance and appraisal guides for aging infrastructure; design for durability through performance based design approaches.

Lecture three hours a week

**CIVJ 5192 [0.5 credit] (CVG 5192)****Characterization Methods for Materials**

Modern materials characterization techniques especially with respect to civil engineering materials. Choosing the right characterization methods in order to determine the properties of materials such as chemical composition, atomic structure, and surface properties used in their research. Interpreting the results of each method.

**CIVJ 5193 [0.5 credit] (CVG 5193)****Instrumentation and Experimental Design for Civil Engineering**

Introduction to instrumentation in civil engineering applications. Instrument types and performance, strain gauges, transducers, measurement of position, velocity, acceleration, force, pressure, temperature and flow. Data collection and data acquisition systems; diagnostics and calibration, closed versus open-loop control; servomotor types and servo-valves.

**CIVJ 5201 [0.5 credit] (CVG 5142)****Advanced Structural Dynamics**

Dynamic behaviour of civil engineering structures under excitations due to earthquakes, wind, waves. Advanced methods in dynamic analysis of structures. Prediction of structural response. Design considerations.

**CIVJ 5202 [0.5 credit] (CVG 5143)****Advanced Structural Steel Design**

Analysis of thin-walled beams, design applications including members under combined forces, analysis and design of beams under non-uniform torsion, limit state design methodology, comparative study of modern structural steel standards, formulating elastic and plastic interaction relations for members under combined forces, designing columns, beams.

**CIVJ 5203 [0.5 credit] (CVG 5145)****Theory of Elasticity**

Stress-strain relations. Theories of plane stress and plane strain. Use of stress functions, energy and variational methods in the analysis of elastostatic problems.

**CIVJ 5204 [0.5 credit] (CVG 5147)****Theory of Plates and Shells**

Stress distribution in flat plates of various shapes. Large deflection theory, numerical methods. Membrane theory, bending theory for cylindrical shells, bending theory for shells of revolution.

**CIVJ 5206 [0.5 credit] (CVG 5150)****Advanced Concrete Technology**

Cement: types, hydration, physical properties; aggregate: classification, grading, properties; fresh concrete: influence of basis constituents and admixtures on workability, mixing, placing; strength of hardened concrete; nature of strength, influence of constituents, curing methods; durability; chemical attack, frost action, thermal effects; elasticity, shrinkage and creep.

**CIVJ 5207 [0.5 credit] (CVG 5216)****Sustainable and Resilient Infrastructure in Changing Climate**

Development of infrastructure with long-term sustainability and resiliency under various extreme events; climate change drivers, climate modelling and climate change impact studies. The concepts of sustainability, resiliency, and reliability. Climatic and flooding hazards. Uncertainty and non-stationarity processes.

**CIVJ 5209 [0.5 credit] (CVG 5153)****Wind Engineering**

The structure and climate of wind; wind loading on structures; wind induced dynamic problems of structures; environmental aerodynamics; dispersion of pollutant; analysis of wind data; experimental investigations.

**CIVJ 5212 [0.5 credit] (CVG 5212)****Climate Change Impacts on Water Resources**

Spatiotemporal distribution of water and its impact on human activities, including domestic and municipal consumption, hydropower generation, rain-fed and irrigated agriculture, design and operation of sewer systems, floodplain zoning, navigation, etc. Critical assessment of methodologies for climate change impacts estimation. Theoretical knowledge and hands-on applications.

Also listed as ENVJ 5212.

**CIVJ 5300 [0.5 credit] (CVG 5144)****Advanced Reinforced Concrete**

Study of the elastic and inelastic response of reinforced concrete structures under monotonic and cyclic loading. Methods for predicting structural behaviour of concrete elements. The relationship between recent research results and building codes.

**CIVJ 5301 [0.5 credit] (CVG 5156)****Finite Element Methods I**

Review of basic matrix methods. Structural idealizations. The displacement versus the force method. Stiffness properties of structural elements. Finite elements in beam bending, plane stress and plate bending. Precludes additional credit for CIVE 5103.

**CIVJ 5302 [0.5 credit] (CVG 5146)****Numerical Methods of Structural Analysis**

Numerical procedures and methods of successive approximations for the solution of structural problems. Virtual work, principles of minimum potential and complementary energy. Applications of variation and finite difference techniques to the solutions of complicated problems in beams, plates and shells.

**CIVJ 5303 [0.5 credit] (CVG 5157)****Finite Element Methods II**

Application of finite elements to folded plates, shells and continua. Convergence criteria and order of accuracy. Inertial and initial stress properties. Dynamic and buckling problems. Non-linear deflections and plasticity. Precludes additional credit for CIVE 5105.

**CIVJ 5304 [0.5 credit] (CVG 5149)****Structural Stability**

Elastic, inelastic, and torsional buckling of columns, beam column behaviour, plane and space frame stability, lateral torsional buckling of beams, global buckling of truss systems, plate and shell buckling, local buckling in tubulars, use of energy methods, matrix analysis, and finite element analysis.

**CIVJ 5305 [0.5 credit] (CVG 5148)****Prestressed Concrete Design**

Materials, methods of prestressing, prestress losses, and anchorage zone stresses. Elastic analysis, design and behaviour of simple and continuous prestressed concrete beams, frames and slabs. Discussion of current design specifications. Ultimate strength of members.

**CIVJ 5306 [0.5 credit] (CVG 5155)****Earthquake Engineering**

Nature and characteristics of earthquake motions. Non-linear response of single and multi-degree-of-freedom structures to seismic excitations. Modal superposition technique. Simplified procedures for dynamic structural analysis. Principles of earthquake-resistant design. Strength, stiffness, ductility and energy absorption requirements of structures for seismic forces. Response spectra.

**CIVJ 5307 [0.5 credit] (CVG 5158)****Elements of Bridge Engineering**

Introduction; limit state design; highway bridge design loads; analysis and design of concrete decks; impact and dynamics; load capacity rating of existing bridges and construction in cold climate.

**CIVJ 5308 [0.5 credit] (CVG 5154)****Random Vibrations**

Descriptions of random data. Frequency domain analysis and time domain analysis. Stochastic response of structures; wind and earthquake excitation, etc. Data analysis techniques. Prediction for design purposes. Simulation of random processes.

**CIVJ 5309 [0.5 credit] (CVG 5159)****Long Span Structures**

Mechanics of cables. Suspension bridges and cable-stayed bridges. Space structures. Design and construction of long span structures. Dynamics of long span bridges. Case studies. Future of long span structures. Includes: Experiential Learning Activity

**CIVJ 5310 [0.5 credit] (CVG 5311)****Bridge Design**

Design of highway bridges, Canadian Highway Bridge Design Code (CHBDC). Comparisons with other bridge codes (AASHTO, the European, the New Zealand, and the British). Structural components of highway bridges, types of highway bridges, serviceability and ultimate limit state design requirements, design loads.

**CIVJ 5311 [0.5 credit] (CVG 5312)****Durability of Concrete Structures**

Properties of cementitious materials (constituents of concrete, hydration of cement, structure of hardened concrete, transport processes in concrete); deterioration of concrete (built-in problems, construction defects, cracking, dimensional stability, alkali-aggregate reaction, sulphate attack, corrosion of reinforcing steel, freezing-thawing cycles); evaluation of concrete structures.

**CIVJ 5312 [0.5 credit] (CVG 5313)****Seismic Analysis and Design of Concrete Structures**

Review of seismic hazards in Canada, building code provisions for earthquake loads, uniform hazard spectra, linear elastic modal response spectrum analysis, linear elastic time history analysis, equivalent static force procedure, advanced state-of-the-art nonlinear modeling techniques (FEM and fiber modeling), performance-based earthquake engineering and displacement-based design. Includes: Experiential Learning Activity

**CIVJ 5333 [0.5 credit] (CVG 5333)****Research Methodology**

Key components and strategies required to build a robust scientific research program in civil engineering including research questions, literature review, experiment design, data interpretation, scientific manuscripts, public speaking, ethics, and plagiarism.

Also listed as ENVJ 5333.

**CIVJ 5501 [0.5 credit] (CVG 5111)****Hydraulic Structures**

Classification and function of hydraulic structures; analysis and design of hydraulic works for gravity dams, arch dams, earth fill and rock-fill dams; ancillary works including water intakes, various types of spillways, control structures, energy dissipation and stilling basin, bottom outlets. channel design.

**CIVJ 5502 [0.5 credit] (CVG 5112)****Numerical Modelling in Water Resources**

Finite volume methods for advection, diffusion and shallow water equations using structured and unstructured grids, finite volume methods for incompressible Navier-Stokes equations (SIMPLE, SIMPLEC, PISO), error analysis: numerical diffusion and dispersion, truncation errors and Fourier analysis, introduction to turbulence modeling, methods for tracking free surfaces.

**CIVJ 5503 [0.5 credit] (CVG 5160)****Sediment Transport**

Introduction to particle transport with emphasis on river engineering applications, including natural channel design. Sediment properties, initiation of motion, bed load, suspended load, fluvial dunes, alluvial channels, bank erosion and protection, natural channel design. Special topics include contaminated sediments, local scour, morphodynamic modelling, fluvial habitat.

**CIVJ 5504 [0.5 credit] (CVG 5162)****River Hydraulics**

Advanced concepts of river hydraulics, with an emphasis on field measurement techniques and application of numerical models. Navier-Stokes equations, turbulence, flow resistance, numerical modeling of simplified momentum and continuity equations, field-based measurement and statistical analysis of velocity fields. Special topics include contaminant transport, morphodynamic modeling.

**CIVJ 5605 [0.5 credit] (CVG 5124)****Coastal Engineering**

Key concepts in coastal engineering: (1) wave mechanics and coastal hydrodynamics, (2) sediment transport and coastal morphodynamics and (3) coastal structures and coastal zone management. Wave mechanics and coastal hydrodynamics to include small-amplitude wave theory, finite amplitude wave theories (Stokes, Cnoidal and solitary wave).

**CIVJ 6000 [0.5 credit] (CVG 6300)****Special Topics in Civil Engineering****CIVJ 6001 [0.5 credit] (CVG 6301)****Special Topics in Civil Engineering****CIVJ 6002 [0.5 credit] (CVG 6302)****Special Topics in Civil Engineering****CIVJ 6003 [0.5 credit] (CVG 6303)****Special Topics in Civil Engineering****CIVJ 6004 [0.5 credit] (CVG 6304)****Special Topics in Civil Engineering****CIVJ 6005 [0.5 credit] (CVG 6305)****Special Topics in Civil Engineering****CIVJ 6006 [0.5 credit] (CVG 6306)****Special Topics in Civil Engineering****CIVJ 6007 [0.5 credit] (CVG 6307)****Special Topics in Civil Engineering****CIVJ 6008 [0.5 credit] (CVG 6308)****Special Topics in Civil Engineering****CIVJ 6009 [0.5 credit] (CVG 6309)****Special Topics in Civil Engineering****CIVJ 6010 [0.5 credit] (CVG 6310)****Special Topics in Civil Engineering****CIVJ 6011 [0.5 credit] (CVG 6311)****Special Topics in Civil Engineering****CIVJ 6012 [0.5 credit] (CVG 6312)****Special Topics in Civil Engineering**

**CIVJ 6013 [0.5 credit] (CVG 6313)**  
**Special Topics in Civil Engineering**

**CIVJ 6014 [0.5 credit] (CVG 6314)**  
**Special Topics in Civil Engineering**

**CIVJ 6015 [0.5 credit] (CVG 6315)**  
**Special Topics in Civil Engineering**

**CIVJ 6016 [0.5 credit] (CVG 6316)**  
**Special Topics in Civil Engineering**

**CIVJ 6017 [0.5 credit] (CVG 6317)**  
**Special Topics in Civil Engineering**

**CIVJ 6018 [0.5 credit] (CVG 6318)**  
**Special Topics in Civil Engineering**

**CIVJ 6019 [0.5 credit] (CVG 6019)**  
**Special Topics in Civil Engineering**

**CIVJ 6020 [0.5 credit] (CVG 6320)**  
**Special Topics in Civil Engineering**

### **Civil Engineering (CIVE) Courses**

**CIVE 5101 [0.5 credit] (CVG 7120)**  
**Solid Mechanics**

Cartesian tensor notation; stresses and strains in a continuum; transformations, invariants; equations of motion; constitutive relations; generalized Hooke's Law, bounds for elastic constant: strain energy, superposition, uniqueness; formulation of plane stress and plane strain problems; energy principles, variational methods; plasticity.

**CIVE 5103 [0.5 credit] (CVG 7122)**  
**Finite Element Analysis 1**

Advanced finite element methods for linear systems. The relationship with variational and Galerkin formulations, system of linear equations, polynomial interpolation, numerical integration, and theory of elasticity is explored. Isoparametric formulations for structural and continuum elements are examined. Introduction to linear dynamics and nonlinear problems.  
Precludes additional credit for CIVJ 5301.  
Also offered at the undergraduate level, with different requirements, as CIVE 4201, for which additional credit is precluded.

**CIVE 5104 [0.5 credit] (CVG 7123)**  
**Earthquake Engineering and Analysis**

Advanced vibration analysis techniques; Rayleigh-Ritz procedure; subspace iteration; derived Ritz coordinates; proportional and non-proportional damping; introduction to seismology; earthquake response analysis via time and frequency domain; response spectrum approach; multiple input excitations; design considerations and code requirements; other advanced topics in earthquake engineering.  
Prerequisite(s): CIVE 5106 or permission of the Department.

**CIVE 5105 [0.5 credit] (CVG 7124)**  
**Finite Element Analysis 2**

Variational and Galerkin formulations: assumed displacement, assumed stress and hybrid elements; plate bending: convergence, completeness and conformity, patch test, Kirchhoff and Mindlin plate theories, nonlinear elasticity and plasticity; geometric non-linearity, Eulerian and Lagrangian formulations; incremental and iterative schemes, finite elements in dynamics.  
Precludes additional credit for CIVJ 5303.  
Prerequisite(s): CIVE 5103 or permission of the Department.

**CIVE 5106 [0.5 credit] (CVG 7137)**  
**Dynamics of Structures**

Structural dynamics, single and multi-degree-of-freedom systems, formulation of equations of motion, methods of analytical mechanics, free and forced vibrations, normal mode analysis, numerical methods for the response analyses of single and multiple-degree-of-freedom systems.

**CIVE 5108 [0.5 credit] (CVG 7181)**  
**Performance-Based Earthquake Engineering**

Seismic performance assessment of new and existing buildings using modelling. Design and construction of nonlinear structural models. Accounting for mass, material behaviour, damping, and nonlinear geometry. Use of pushover and time history analysis methods to determine seismic performance. Consideration of nonstructural elements in determining performance.

**CIVE 5109 [0.5 credit]**  
**Estimation and Identification in Dynamics using Data**  
Dynamical systems and their computational models, probability and stochastic processes, stochastic dynamical systems, state estimation in linear dynamics using Kalman filtering, state estimation of nonlinear dynamical systems, system identification using combined state and parameter estimation, application to engineering.  
Includes: Experiential Learning Activity

**CIVE 5200 [0.5 credit] (CVG 7138)****Masonry Behaviour and Design**

Properties of masonry materials and assemblages. Behaviour and design of walls, columns and lintels. Treatment of specialized design and construction topics. Design of lowrise and highrise structures. Discussion of masonry problems. Emphasis on a practice-oriented approach.

Also offered at the undergraduate level, with different requirements, as CIVE 4403, for which additional credit is precluded.

**CIVE 5202 [0.5 credit]****Structural Assessment of Historic Buildings**

General concepts related to conservation of heritage structures; materials, construction techniques and structural components; classical structural analysis approaches; seismic behaviour, damage and collapse mechanisms of historic buildings; modern conservation criteria and practical implementation of repair or strengthening strategies.

Also listed as BLDG 5202.

**CIVE 5204 [0.5 credit] (CVG 7126)****Advanced Steel Structures**

Limit states design philosophy; material behaviour; tension members; plate buckling; torsion; lateral torsional buckling; beams, axially loaded columns and beam-column behaviour; brittle fracture and fatigue; frame stability and second order effects.

**CIVE 5206 [0.5 credit] (CVG 7128)****Prestressed Concrete**

Behaviour and analysis of prestressed concrete elements subjected to axial loads, flexure and shear: material properties; prestressing systems; linear and non-linear behaviour; deflections; compression-field approaches; disturbed regions; restraint of deformations; design requirements; applications to pressure vessels, bridges and frames.

**CIVE 5208 [0.5 credit] (CVG 7130)****Advanced Mechanics of Reinforced Concrete**

Review of various analytical methods, constitutive models, and failure criteria for reinforced concrete structures; performance assessment and forensic analysis; nonlinear finite element analysis of concrete structures.

**CIVE 5209 [0.5 credit] (CVG 7100)****Geotechnical Case Studies**

The critical study of case histories relating to current procedures of design and construction in geotechnical engineering. The importance of instrumentation and monitoring field behaviour will be stressed. In-situ testing. Includes: Experiential Learning Activity

**CIVE 5210 [0.5 credit]****Advanced Computational Modeling Strategies of Historic Buildings**

Introduction to conservation engineering; commonly used construction materials in historic buildings and their constitutive laws; Graphical and numerical methods to analyze masonry arches; Theory and application of discrete element method and its applications to assess masonry buildings.

Also listed as BLDG 5203.

**CIVE 5300 [0.5 credit] (CVG 7101)****Advanced Soil Mechanics**

Effective stress, pore pressure parameters, saturated and partially saturated soils; seepage; permeability tensor, solutions of the Laplace equation; elastic equilibrium; anisotropy, non-homogeneity, consolidation theories; shear strength of cohesive and cohesionless soils; failure and yield criteria.

**CIVE 5303 [0.5 credit] (CVG 7103)****Pavements and Materials**

An analysis of the interaction of materials, traffic, and climate in the planning, design construction, evaluation, maintenance, and rehabilitation of highway and airport pavements.

**CIVE 5305 [0.5 credit] (CVG 7151)****Traffic Engineering**

Introduction to principles of traffic engineering. Traffic operation concepts. Travel modes and modal characteristics. Traffic stream characteristics and queuing theory. Capacity and level of service analysis of roads and intersections.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as CIVE 4205, for which additional credit is precluded.

**CIVE 5307 [0.5 credit] (CVG 7153)****Urban Transportation**

Urban transportation systems, planning and management. Introduction to models of urban travel demand. Overview of modern transportation planning issues and policies. The role of transportation planning within the wider context of transportation decision-making. Transportation land use interaction.

**CIVE 5308 [0.5 credit] (CVG 7154)****Highway Geometric Design**

Principles of highway geometric design. Safety and human factors, and their interaction with the road elements. Multimodal considerations. Road design elements. New and evolving concepts.

**CIVE 5310 [0.5 credit]****Road Safety Analysis**

Fundamental analytical techniques for road safety analysis, background of traffic safety analysis, network screening, before and after analysis, and surrogate measures of safety.

**CIVE 5311 [0.5 credit]****Advanced Pavement Engineering and Management**

Civil infrastructure system, pavement network analysis, pavement structural designs, PMED, pavement management systems, life cycle assessment (LCA) methodologies, life cycle cost analysis (LCCA) procedures.

**CIVE 5403 [0.5 credit] (CVG 7158)****Airport Planning**

Framework for airport planning and design. Aircraft characteristics; demand forecasting; airport site selection; noise, airside capacity; geometric design; the passenger terminal complex; cargo area; general aviation; ground transportation; land use planning.

**CIVE 5500 [0.5 credit] (CVG 7104)****Earth Retaining Structures**

Approaches to the theoretical and semi-empirical analysis of earth retaining structures. Review of the earth pressure theories. Analysis and design methods for rigid and flexible retaining walls, braced excavations, and tunnels. Instrumentation and performance studies.

**CIVE 5501 [0.5 credit] (CVG 7105)****Advanced Foundation Engineering**

Review of methods of estimating compression and shear strength of soils. Bearing capacity of shallow and deep foundations. Foundations in slopes. Pile groups. Use of in-situ testing for design purposes.

**CIVE 5503 [0.5 credit] (CVG 7107)****Numerical Methods in Geomechanics**

Advanced theories of soil and rock behaviour. Plasticity models. Generalized failure criteria. Critical state and cap models. Dilatancy effects. Associative and non-associative flow rules. Hardening rules. Consolidation, visco-elasticity, creep behaviour. Finite element formulation. Iterative schemes. Time marching schemes. Solution of typical boundary value problems.

Prerequisite(s): CIVE 5101, CIVE 5103, or permission of the Department.

**CIVE 5505 [0.5 credit] (CVG 7109)****Geotechnical Earthquake Engineering**

Seismic hazards, earthquakes and ground motion, wave propagation, ground response analysis, soil properties for dynamic analysis: laboratory tests, in-situ tests, modulus and damping curves, liquefaction susceptibility, post liquefaction response, seismic effects on slope stability, retaining structures.

Precludes additional credit for CIVE 5801 (2001-2003).

**CIVE 5506 [0.5 credit]****Fundamentals of Geomechanics**

Tensor calculus, Cauchy stress, kinematics of continuum deformation (strain), elasticity for geomaterials, plasticity for geomaterials, constitutive models for soils, Cam-clay model.

**CIVE 5507 [0.5 credit] (CVG 7184)****Blast Load Effects on Structures**

Threats, risk analysis, vulnerability assessment; explosives: types and mechanisms; load determination; response of structural elements under blast loads, analysis and design for blast loads; blast mitigation, retrofit of structures; post-event assessment.

Also listed as IPIS 5507.

Prerequisite(s): those enrolled in the M.IPIS program must have prior knowledge of structural steel and reinforced concrete design, typically obtained through the completion of an undergraduate engineering degree.

**CIVE 5603 [0.5 credit]****Advanced Building Characterization, Conservation and Rehabilitation**

Supporting concepts and techniques for the identification, documentation, and conservation of heritage and existing buildings; advanced workshops by experts from key disciplines and practice areas in heritage conservation. Includes: Experiential Learning Activity  
Also listed as BLDG 5201.

**CIVE 5604 [0.5 credit]****Probability, Statistics, Stochastic Processes and Statistical Inference in Engineering**

Fundamental of probability and statistics, (robust and ridge) regression, generalised linear models, sparse models, mixture models, stochastic processes, statistical inference and applications.

Includes: Experiential Learning Activity

**CIVE 5609 [0.5 credit] (CVG 7170)****Fundamentals of Fire Safety Engineering**

The fire safety system, including social, economic and environmental issues; description of the fire safety regulatory system and the governing building codes and standards. This includes the global fire safety system in a facility and active fire protection systems; detection, suppression, smoke management.

Precludes additional credit for CIVE 5707 (2001-2002).

**CIVE 5610 [0.5 credit] (CVG 7171)****Fire Dynamics I**

Fundamentals of combustion including material and energy balances, chemical thermodynamics, kinetics, premixed and diffusive burning. Advanced topics in the theory of combustion, flame propagation, efficiency of combustion, and the physico-chemical properties of combustible material.

Precludes additional credit for CIVE 5705 (2001-2003).

**CIVE 5611 [0.5 credit] (CVG 7173)****People in Fires**

Review of the work presented by the founders in the field of human behaviour in fire. Introduction to the basic notions of perception, cognition, information processing, decision-making and problem solving. Behavioural concepts such as panic, commitment, affiliation, familiarity and role are discussed.

**CIVE 5612 [0.5 credit] (CVG 7174)****Fire Modeling**

Fire modeling and its role in fire safety engineering. Review of the main modeling techniques used in Fire Safety Engineering: network, zone and Computational Fluid Dynamics (CFD).

Precludes additional credit for CIVE 5802 (2002-2003).

**CIVE 5613 [0.5 credit] (CVG 7172)****Fire Dynamics II**

Fire dynamics from ignition through heat transfer to growth and spread of fires and their suppression. Factors such as containment and its role in the dynamics of fires and explosions are covered.

Precludes additional credit for CIVE 5803 (2002-2003).

Prerequisite(s): CIVE 5610 Fire Dynamics I.

**CIVE 5614 [0.5 credit] (CVG 7175)****Design for Fire Resistance**

Behaviour of materials and structures at elevated temperatures; fire-resistance tests; fire-resistance ratings; building code requirements; real-world fires; assessing the fire resistance of steel, concrete and wood building assemblies.

Precludes additional credit for CIVE 5709 (2001-2003).

**CIVE 5615 [0.5 credit] (CVG 5320)****Fire Behaviour of Materials**

Fundamentals and scientific aspects of materials behaviour during fires, material specifications, thermal and mechanical properties, fire hazards of materials, structural fire response, residual strength, failure criteria, mechanisms of flame retardancy, and standards and testing protocols.

**CIVE 5616 [0.5 credit]****Wood Structures and Fire**

Introduction to fire-safe design of wood buildings, brief review of wood products and wood design, prescriptive code requirements, determination of fire-resistance of wood structures through different methods.

Includes: Experiential Learning Activity

**CIVE 5617 [0.5 credit]****Practical Applications of Fire Protection**

Introduction to the practical application of fire protection engineering from a consulting and a regulatory perspective. Main highlights include performance-based design, fire forensics, emergency preparedness and firefighting.

Includes: Experiential Learning Activity

**CIVE 5705 [0.5 credit] (CVG 7300)****Topics in Structures**

Courses in special topics related to building design and construction, not covered by other graduate courses.

**CIVE 5706 [0.5 credit] (CVG 7301)****Topics in Structures**

Courses in special topics related to building design and construction, not covered by other graduate courses.

**CIVE 5707 [0.5 credit] (CVG 7302)****Topics in Structures**

Courses in special topics related to building design and construction, not covered by other graduate courses.

**CIVE 5708 [0.5 credit] (CVG 7303)****Topics in Structures**

Courses in special topics related to building design and construction, not covered by other graduate courses.

**CIVE 5709 [0.5 credit] (CVG 7304)****Topics in Structures**

Courses in special topics related to building design and construction, not covered by other graduate courses.

**CIVE 5800 [0.5 credit] (CVG 7305)****Topics in Geotechnique**

Courses in special topics in geotechnical engineering, not covered by other graduate courses.

**CIVE 5801 [0.5 credit] (CVG 7306)****Topics in Geotechnique**

Courses in special topics in geotechnical engineering, not covered by other graduate courses.

**CIVE 5802 [0.5 credit] (CVG 7307)****Topics in Geotechnique**

Courses in special topics in geotechnical engineering, not covered by other graduate courses.

**CIVE 5803 [0.5 credit] (CVG 7308)****Topics in Geotechnique**

Courses in special topics in geotechnical engineering, not covered by other graduate courses.

**CIVE 5804 [0.5 credit] (CVG 7309)****Topics in Geotechnique**

Courses in special topics in geotechnical engineering, not covered by other graduate courses.

**CIVE 5805 [0.5 credit] (CVG 7310)****Topics in Transportation**

Courses in special topics in transportation engineering, not covered by other graduate courses.

**CIVE 5806 [0.5 credit] (CVG 7311)****Topics in Transportation**

Courses in special topics in transportation engineering, not covered by other graduate courses.

**CIVE 5807 [0.5 credit] (CVG 7312)****Topics in Transportation**

Courses in special topics in transportation engineering, not covered by other graduate courses.

**CIVE 5808 [0.5 credit] (CVG 7313)****Topics in Transportation**

Courses in special topics in transportation engineering, not covered by other graduate courses.

**CIVE 5809 [0.5 credit] (CVG 7314)****Topics in Transportation**

Courses in special topics in transportation engineering, not covered by other graduate courses.

**CIVE 5810 [0.5 credit] (CVG 7185)****Topics in Fire Safety**

Courses in special topics related to fire safety, not covered by other graduate courses.

**CIVE 5811 [0.5 credit]****Topics in Fire Safety**

Courses in special topics related to fire safety, not covered by other graduate courses.

**CIVE 5812 [0.5 credit]****Topics in Fire Safety**

Courses in special topics related to fire safety, not covered by other graduate courses.

**CIVE 5813 [0.5 credit]****Topics in Fire Safety**

Courses in special topics related to fire safety, not covered by other graduate courses.

**CIVE 5814 [0.5 credit]****Topics in Fire Safety**

Courses in special topics related to fire safety, not covered by other graduate courses.

**CIVE 5900 [1.0 credit] (CVG 6000)****Civil Engineering Project**

Students enrolled in the program M.Eng. by project will conduct an engineering study, analysis, or design project under the general supervision of a member of the Department.

Includes: Experiential Learning Activity

**CIVE 5901 [0.0 credit] (CVG 7314)****Master's Seminar**

The series consists of presentations by graduate students or external speakers. Graduate students in the Civil Engineering program are required to participate in these seminar series by attending all seminars and making at least one presentation during their graduate studies.

**CIVE 5906 [0.5 credit] (CVG 6108)****Directed Studies 1**

Prerequisite(s): open only to students in a Civil Engineering Master's program.

**CIVE 5909 [2.5 credits] (CVG 5909)****M.A.Sc. Thesis**

Includes: Experiential Learning Activity

**CIVE 6901 [0.0 credit]****Ph.D. Seminar**

The series consists of presentations by graduate students or external speakers. Graduate students in the Civil Engineering program are required to participate in these seminar series by attending all seminars and making at least one presentation during their graduate studies.

**CIVE 6902 [0.0 credit] (CVG 9998)****Ph.D. Comprehensive Examination**

Graduate students at the Doctoral level in the Civil Engineering program are required to successfully complete written and oral comprehensive examinations in subject areas determined by the student's advisory committee.

**CIVE 6903 [0.0 credit]****Ph.D. Proposal**

Graduate students at the Doctoral level in the Civil Engineering program are required to successfully complete a PhD Thesis Proposal which consists of a written proposal and a successful defence of the proposal. Students should register in term they will defend their proposal.

Prerequisite(s): CIVE 6909 (taken concurrently).

**CIVE 6906 [0.5 credit] (CVG 6109)****Directed Studies 2**

Prerequisite(s): open only to students in the Civil Engineering Ph.D. program.

**CIVE 6909 [0.0 credit] (CVG 9999)****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Climate Change (Collaborative Program)

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This section presents the requirements for programs in:

- **M.A. Anthropology with Collaborative Specialization in Climate Change**
- **M. Architecture 2-year stream with Collaborative Specialization in Climate Change**
- **M. Architecture 3-year stream with Collaborative Specialization in Climate Change**
- **M.A.Sc. Civil Engineering with Collaborative Specialization in Climate Change**
- **M.Eng. Civil Engineering with Collaborative Specialization in Climate Change**
- **M.A. Communication with Collaborative Specialization in Climate Change**
- **M.A. Economics with Collaborative Specialization in Climate Change**
- **M.A. English with Collaborative Specialization in Climate Change**
- **M.A. Geography with Collaborative Specialization in Climate Change**
- **M.Sc. Geography with Collaborative Specialization in Climate Change**
- **M.A. History with Collaborative Specialization in Climate Change**
- **M.A. International Affairs with Collaborative Specialization in Climate Change**
- **M.A. Migration and Diaspora Studies with Collaborative Specialization in Climate Change**
- **M.A. Psychology with Collaborative Specialization in Climate Change**
- **M.A. Sociology with Collaborative Specialization in Climate Change**
- **M.A.Sc. Aerospace Engineering with Collaborative Specialization in Climate Change**
- **M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Climate Change**
- **M.A.Sc. Environmental Engineering with Collaborative Specialization in Climate Change**
- **M.A.Sc. Materials Engineering with Collaborative Specialization in Climate Change**
- **M.A.Sc. Mechanical Engineering with Collaborative Specialization in Climate Change**
- **M.B.A. with Collaborative Specialization in Climate Change**
- **M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Climate Change**
- **M.Eng. Environmental Engineering with Collaborative Specialization in Climate Change**
- **M.A. Political Economy with Collaborative Specialization in Climate Change**
- **Master of Public Policy and Administration with Collaborative Specialization in Climate Change**

- **Master of Public Policy - Sustainable Energy and the Environment with Collaborative Specialization in Climate Change**
- **M.Eng. Sustainable Energy with Collaborative Specialization in Climate Change**
- **M.Sc. Management with Collaborative Specialization in Climate Change**

## Program Requirements

### M.A. Anthropology with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5401 [0.5] Theory in Anthropology	
ANTH 5402 [0.5] Research in Anthropology	
<b>4. 1.0 credit in</b> approved electives, chosen in consultation with the student's advisor	<b>1.0</b>
<b>5. 2.0 credits in:</b>	<b>2.0</b>
ANTH 5909 [2.0] M.A. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5401 [0.5] Theory in Anthropology	
ANTH 5402 [0.5] Research in Anthropology	
<b>4. 2.0 credit in</b> approved electives, chosen in consultation with the student's advisor	<b>2.0</b>
<b>5. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5908 [1.0] M.A. Research Essay (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	<b>0.0</b>
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	<b>1.0</b>
ANTH 5401 [0.5] Theory in Anthropology	
ANTH 5402 [0.5] Research in Anthropology	
<b>4. 0.5 credit in</b> a 5000-level ANTH course with sufficient climate change content, with departmental approval	<b>0.5</b>
<b>5. 2.5 credits in</b> approved electives, chosen in consultation with the student's advisor	<b>2.5</b>
<b>Total Credits</b>	<b>5.0</b>

### M. Architecture 2-year stream with Collaborative Specialization in Climate Change (8.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 2.5 credits in core:</b>	<b>2.5</b>
ARCH 5224 [0.5] Advanced Building Systems	
ARCH 5333 [0.5] Selected Topics in Architectural Theory	
ARCH 5444 [0.5] Comprehensive Studio Workshop	
ARCH 5551 [0.5] Professional Practice	
ARCH 5552 [0.5] Design Thesis Preparation	
<b>4. 2.0 credits in studio:</b>	<b>2.0</b>
ARCH 5114 [1.0] Comprehensive Studio: Climate + Integration	
ARCH 5115 [1.0] Graduate Studio Abroad: Agency + Justice	
<b>5. 2.0 credits in:</b>	<b>2.0</b>
ARCH 5555 [2.0] Architecture Thesis	
Thesis topic must be related to climate change.	
<b>6. 0.5 credits in free electives at the 4000-level or higher</b>	<b>0.5</b>
<b>Total Credits</b>	<b>8.0</b>

### M. Architecture 3-year stream with Collaborative Specialization in Climate Change (15.0 credits)

Note: Please consult the School regarding registration sequence.

#### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 6.0 credits in core:</b>	<b>6.0</b>
ARCH 5221 [0.5] Ecological & Regulatory Systems	
ARCH 5222 [0.5] Structures	
ARCH 5223 [1.0] Assemblies and Environmental Systems	
ARCH 5224 [0.5] Advanced Building Systems	
ARCH 5331 [0.5] Modernism and Global Urbanism	
ARCH 5332 [0.5] Contemporary Theories in Architecture	
ARCH 5333 [0.5] Selected Topics in Architectural Theory	
ARCH 5441 [0.5] Studio 1: Workshop	
ARCH 5444 [0.5] Comprehensive Studio Workshop	
ARCH 5551 [0.5] Professional Practice	
ARCH 5552 [0.5] Design Thesis Preparation	
<b>4. 5.0 credits in studio:</b>	<b>5.0</b>
ARCH 5111 [1.0] Studio I: Land & Environment	
ARCH 5112 [1.0] Studio II: Materiality + Adaptation	

ARCH 5113 [1.0]	Studio III: Urbanism + Society
ARCH 5114 [1.0]	Comprehensive Studio: Climate + Integration
ARCH 5115 [1.0]	Graduate Studio Abroad: Agency + Justice

**5. 2.0 credits in:** **2.0**

ARCH 5555 [2.0]	Architecture Thesis (in the Specialization)
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**6. 1.0 credits in free electives at the 4000-level or higher** **1.0**

**Total Credits** **15.0**

### M.A.Sc. Civil Engineering with Collaborative Specialization in Climate Change (6.0 credits)

#### Requirements:

**1. 1.0 credit in:** **1.0**

CLIM 5000 [1.0]	Climate Collaboration
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**2. 0.0 credit in:** **0.0**

CLIM 5800 [0.0]	Climate Seminar Series
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**3. 2.5 credits in** courses listed below (other courses may be taken with prior departmental approval) **2.5**

**4. 0.0 credit in:**

CIVE 5901 [0.0]	Master's Seminar
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**5. 2.5 credits in:** **2.5**

CIVE 5909 [2.5]	M.A.Sc. Thesis (in the specialization)
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**Note: no more than 0.5 credit may be taken from the following: CIVE 5103, CIVE 5200, CIVE 5305**

**Total Credits** **6.0**

### M.Eng. Civil Engineering with Collaborative Specialization in Climate Change (6.0 credits)

#### Requirements - Project pathway:

**1. 1.0 credit in:** **1.0**

CLIM 5000 [1.0]	Climate Collaboration
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**2. 0.0 credit in:**

CLIM 5800 [0.0]	Climate Seminar Series
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**3. 4.0 credits in** courses listed below (other courses may be taken with prior departmental approval) **4.0**

**4. 1.0 credit in:** **1.0**

CIVE 5900 [1.0]	Civil Engineering Project (in the specialization)
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**Note: no more than 1.0 credit may be taken from the following: CIVE 5103, CIVE 5200, CIVE 5305**

**Total Credits** **6.0**

#### Requirements - Coursework pathway:

**1. 1.0 credit in:** **1.0**

CLIM 5000 [1.0]	Climate Collaboration
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**2. 0.0 credit in:**

CLIM 5800 [0.0]	Climate Seminar Series
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**3. 4.0 credits in** courses listed below (other courses may be taken with prior departmental approval) **4.0**

**4. 1.0 credit from:** **1.0**

ENVE 5105 [0.5]	Atmospheric Aerosols
ENVE 5200 [0.5]	Climate Change and Engineering
ENVE 5201 [0.5]	Geo-Environmental Engineering

ENVE 5205 [0.5]	Sludge Treatment and Disposal
ENVJ 5908 [0.5]	Anaerobic Digestion
ENVJ 5212 [0.5]	Climate Change Impacts on Water Resources

or approved Special Topics in the area of climate change

**Total Credits** **6.0**

### M.A. Communication with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Research essay pathway:

**1. 1.0 credit in:** **1.0**

CLIM 5000 [1.0]	Climate Collaboration
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**2. 0.0 credit in:**

CLIM 5800 [0.0]	Climate Seminar Series
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**3. 1.5 credits in:** **1.5**

COMS 5101 [1.0]	Foundations of Communication Studies
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COMS 5605 [0.5]	Approaches to Communication Research
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**4. 1.0 credit in:** **1.0**

COMS 5908 [1.0]	Research Essay (in the specialization)
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**5. 1.5 credits from** the list of optional courses **1.5**

**Total Credits** **5.0**

#### Requirements - Thesis pathway:

**1. 1.0 credit in:** **1.0**

CLIM 5000 [1.0]	Climate Collaboration
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**2. 0.0 credit in:**

CLIM 5800 [0.0]	Climate Seminar Series
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**3. 1.5 credits in:** **1.5**

COMS 5101 [1.0]	Foundations of Communication Studies
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COMS 5605 [0.5]	Approaches to Communication Research
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**4. 2.0 credits in:** **2.0**

COMS 5909 [2.0]	M.A. Thesis (in the specialization)
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**5. 0.5 credit from** the list of optional courses **0.5**

**Total Credits** **5.0**

### M.A. Economics with Collaborative Specialization in Climate Change (4.0 credits)

#### Requirements - Coursework pathway (4.0 credits)

**1. 1.0 credit in:** **1.0**

CLIM 5000 [1.0]	Climate Collaboration
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**2. 0.0 credit in:**

CLIM 5800 [0.0]	Climate Seminar Series
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**3. 1.5 credit in:** **1.5**

ECON 5020 [0.5]	Microeconomic Theory
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ECON 5021 [0.5]	Macroeconomic Theory
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ECON 5027 [0.5]	Econometrics I
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**4. 0.5 credit in:** **0.5**

ECON 5029 [0.5]	Methods of Economic Research (including a research paper on a Climate Change-related topic)
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**5. 0.5 credit in:** **0.5**

ECON 5507 [0.5]	Environmental Aspects of Economic Development	
ECON 5803 [0.5]	Economics of Natural Resources	
ECON 5804 [0.5]	Economics of the Environment	
ECON 5805 [0.5]	Topics in Environmental and Resource Economics	
or approved Special Topic in the area of Climate Change		
<b>6. 0.5 credit in</b>	ECON at the 5000 level with sufficient Climate Change content (may be an additional course from Item 5 above), chosen in consultation with Department of Economics	0.5
<b>Total Credits</b>		<b>4.0</b>

#### Requirements - Thesis pathway (4.0 credits)

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		1.5
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
<b>4. 1.5 credits in:</b>		1.5
ECON 5909 [1.5]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>4.0</b>

#### M.A. English with Collaborative Specialization in Climate Change (4.5 credits)

##### Requirements - Coursework pathway (4.5 credits)

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 2.5 credits in</b>	ENGL at the 5000-level (excluding ENGL 5908 and ENGL 5909)	2.5
<b>4. 0.5 credit in</b>	a graduate seminar with sufficient Climate Change content in ENGL or another department, as approved by the Coordinator of the Climate Change Specialization.	0.5
<b>5. 0.5 credit in:</b>		0.5
ENGL 5005 [0.5]	M.A. Seminar	
<b>Total Credits</b>		<b>4.5</b>

##### Requirements - Research essay pathway (4.5 credits)

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 0.5 credit in:</b>		0.5
ENGL 5005 [0.5]	M.A. Seminar	
<b>4. 2.0 credits in</b>	ENGL at the 5000 level (excluding ENGL 5908)	2.0
<b>5. 1.0 credit in:</b>		1.0
ENGL 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

#### Requirements - Thesis pathway (4.5 credits)

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in</b>	ENGL at the 5000-level (excluding ENGL 5909)	1.0
<b>4. 0.5 credit in:</b>		0.5
ENGL 5005 [0.5]	M.A. Seminar	
<b>5. 2.0 credits in:</b>		2.0
ENGL 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

#### M.A. Geography with Collaborative Specialization in Climate Change (5.5 credits)

##### Requirements:

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		0.0
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in:</b>		1.0
GEOG 5000 [0.5]	Approaches to Geographical Inquiry	
GEOG 5905 [0.5]	Masters Research Workshop	
<b>4. 2.5 credits in:</b>		2.5
GEOG 5909 [2.5]	M.A. Thesis (in the specialization and including oral examination of the thesis)	
<b>5. 1.0 credit in</b>	approved graduate-level electives	1.0
<b>6. In addition to the formal requirements, MA students are required to attend the Departmental Seminar series, and the Graduate Field Camp.</b>		
<b>Total Credits</b>		<b>5.5</b>

#### M.Sc. Geography with Collaborative Specialization in Climate Change (5.5 credits)

##### Requirements:

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		0.0
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in:</b>		1.0
GEOG 5001 [0.5]	Modeling Environmental Systems	
GEOG 5905 [0.5]	Masters Research Workshop	
<b>4. 0.5 credit in</b>	Physical Geography selected from:	0.5
GEOG 5002 [0.5]	Quantitative Analysis for Geographical Research	
GEOG 5103 [0.5]	Hydrologic Principles and Methods	
GEOG 5104 [0.5]	Advanced Biogeography	
GEOG 5107 [0.5]	Field Study and Methodological Research	
GEOG 5303 [0.5]	Geocryology	
GEOG 5307 [0.5]	Soil Resources	
GEOG 5803 [0.5]	Seminar in Geomatics	
GEOG 5804 [0.5]	Geographic Information Systems	
GEOG 5900 [0.5]	Graduate Tutorial	

up to 0.5 credit in GEOG or GEOM at the 4000 level, with departmental approval

<b>5. 3.0 credits in:</b>	<b>3.0</b>
GEOG 5906 [3.0] M.Sc. Thesis (in the specialization and including oral examination of the thesis)	

6. In addition to the formal requirements, M.Sc. students are required to attend the DGES Departmental Seminar series, and the Graduate Field Camp.

<b>Total Credits</b>	<b>5.5</b>
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## M.A. History with Collaborative Specialization in Climate Change (4.5 credits)

### Requirements - research essay pathway (4.5 credits):

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	

<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	

<b>3. 0.5 credit in:</b>	<b>0.5</b>
HIST 5003 [0.5] Historical Theory and Method	

<b>4. 1.5 credits in HIST</b> at the graduate level of which only 0.5 credit may be taken in a designated public history course. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	<b>1.5</b>
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<b>5. 0.5 credit in:</b>	<b>0.5</b>
HIST 5900 [0.5] Directed Research	

<b>6. 1.0 credit in:</b>	<b>1.0</b>
HIST 5908 [1.0] M.A. Research Essay (in the specialization)	

<b>Total Credits</b>	<b>4.5</b>
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### Requirements - thesis pathway (4.5 credits):

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	

<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	

<b>3. 0.5 credit in:</b>	<b>0.5</b>
HIST 5003 [0.5] Historical Theory and Method	

<b>4. 1.0 credit in HIST</b> at the graduate level of which only 0.5 credit may be taken in a designated public history course. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	<b>1.0</b>
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<b>5. 2.0 credits in:</b>	<b>2.0</b>
HIST 5909 [2.0] M.A. Thesis (in the specialization)	

<b>Total Credits</b>	<b>4.5</b>
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## M.A. International Affairs with Collaborative Specialization in Climate Change (5.0 credits)

### Requirements - Thesis Pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	

<b>2. 0.0 credit in:</b>	<b>0.0</b>
CLIM 5800 [0.0] Climate Seminar Series	

<b>3. 1.5 credits in:</b>	<b>1.5</b>
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INAF 5015 [0.5]	Research Design and Methods for International Affairs
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INAF 5016 [0.5]	Statistical Analysis for International Affairs
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INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
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INAF 5018 [0.25]	Law and International Affairs
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<b>4. 0.5 credit in economics</b> , successfully completed by the end of the second term, from: (see Note 1 below)	<b>0.5</b>
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INAF 5009 [0.5]	International Aspects of Economic Development
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INAF 5205 [0.5]	Economics of Conflict
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INAF 5214 [0.5]	Economics for Defence and Security
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INAF 5221 [0.5]	Economics of Security and Intelligence
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INAF 5308 [0.5]	International Trade: Theory and Policy
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INAF 5309 [0.5]	International Finance: Theory and Policy
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INAF 5600 [0.5]	The Economics of Human Development
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INAF 5703 [0.5]	International Public Economics
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<b>4. 2.0 credits in:</b>	<b>2.0</b>
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INAF 5909 [2.0] M.A. Thesis (in the Specialization)	
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<b>5. Successful completion of second language proficiency examination</b> (see Note 2 below)	
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<b>Total Credits</b>	<b>5.0</b>
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### Requirements - Research Essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	

<b>2. 0.0 credit in:</b>	<b>0.0</b>
CLIM 5800 [0.0] Climate Seminar Series	

<b>3. 1.5 credit in:</b>	<b>1.5</b>
INAF 5015 [0.5] Research Design and Methods for International Affairs	

INAF 5016 [0.5]	Statistical Analysis for International Affairs
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INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
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INAF 5018 [0.25]	Law and International Affairs
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<b>4. 0.5 credit in economics</b> , successfully completed by the end of the second term, from: (see Note 1 below)	<b>0.5</b>
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INAF 5009 [0.5]	International Aspects of Economic Development
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INAF 5205 [0.5]	Economics of Conflict
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INAF 5214 [0.5]	Economics for Defence and Security
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INAF 5221 [0.5]	Economics of Security and Intelligence
-----------------	--

INAF 5308 [0.5]	International Trade: Theory and Policy
-----------------	--

INAF 5309 [0.5]	International Finance: Theory and Policy
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INAF 5600 [0.5]	The Economics of Human Development
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INAF 5703 [0.5]	International Public Economics
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<b>3. 1.0 credit in:</b>	<b>1.0</b>
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INAF 5908 [1.0] Research Essay (in the Specialization)	
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<b>4. 1.0 credits in:</b>	1.0
Field and/or Elective courses (See Note 3 below)	
5. Successful completion of second language proficiency examination (see Note 2 below)	
<b>Total Credits</b>	<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>	
<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	1.0
INAF 5016 [0.5] Statistical Analysis for International Affairs	
INAF 5017 [0.25] International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25] Law and International Affairs	
<b>4. 0.5 credit in economics, successfully completed by the end of the second term, from: (see Note 1 below)</b>	0.5
INAF 5009 [0.5] International Aspects of Economic Development	
INAF 5205 [0.5] Economics of Conflict	
INAF 5214 [0.5] Economics for Defence and Security	
INAF 5221 [0.5] Economics of Security and Intelligence	
INAF 5308 [0.5] International Trade: Theory and Policy	
INAF 5309 [0.5] International Finance: Theory and Policy	
INAF 5600 [0.5] The Economics of Human Development	
INAF 5703 [0.5] International Public Economics	
<b>5. 0.5 credit from:</b>	0.5
INAF 5701 [0.5] Global Environmental Change: Human Implications	
INAF 5702 [0.5] International Environmental Affairs	
A graduate course [0.5] with significant climate change content, approved by the MA Associate Director and Coordinator of the Climate Change Specialization	
<b>6. 2.0 credits in Field and/or Elective courses (see Note 3 below)</b>	2.0
7. Successful completion of second language proficiency examination (see Note 2 below)	
<b>Total Credits</b>	<b>5.0</b>

**Notes:**

1. All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309, or approved equivalent, must be completed in order to receive the field designation.
2. Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies.
3. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in

other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.

**M.A. Migration and Diaspora Studies with Collaborative Specialization in Climate Change (5.0 credits)**

**Requirements - Thesis Pathway:**

<b>1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	
<b>4. 1.0 credit from Migration and Diaspora Studies</b>	1.0
electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	
<b>5. 2.0 credits in:</b>	2.0
MGDS 5909 [2.0] M.A. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Research Essay Pathway:**

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	
<b>4. 0.5 credit in MGDS at the 5000 level. May not include MGDS 5101.</b>	0.5
<b>5. 1.5 credits from Migration and Diaspora Studies</b>	1.5
electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	
<b>6. 1.0 credit in:</b>	1.0
MGDS 5908 [1.0] Research Essay (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Coursework Pathway**

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	
<b>4. 0.5 credit in MGDS at the 5000 level. May not include MGDS 5101.</b>	0.5

<b>5. 2.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	2.0
<b>6. 0.5 credit in</b> a graduate course with sufficient climate change content as approved by the Coordinator of the Climate Change Specialization.	0.5
<b>Total Credits</b>	<b>5.0</b>

### M.A. Psychology with Collaborative Specialization in Climate Change (5.5 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in</b> PSYC 5410 and PSYC 5411 (recommended to complete during the first two terms of the program)	1.0
<b>4. 0.5 credit from</b> Professional Development courses:	0.5
PSYC 5002 [0.5] Ethics in Psychology	
PSYC 5003 [0.5] Open Science and Methodological Improvements	
PSYC 5004 [0.5] Knowledge Mobilization	
PSYC 5802 [0.5] Special Topics: Professional Development	
PSYC 5903 [0.5] Practicum in Psychology	
<b>5. 0.5 credit in</b> PSYC at the 5000-level, excluding Professional Development courses listed above, and excluding Elective Statistics courses	0.5
<b>6. 0.0 credit in:</b>	
PSYC 5906 [0.0] Pro-Seminar in Psychology	
<b>7. 2.5 credits in:</b>	2.5
PSYC 5909 [2.5] M.A. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.5</b>

### M.A. Sociology with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5] Recurring Debates in Social Thought	
SOCI 5809 [0.5] The Logic of the Research Process	
<b>4. 1.0 credit in</b> approved electives, chosen in consultation with the student's advisor	1.0
<b>5. 2.0 credits in:</b>	2.0
SOCI 5909 [2.0] M.A. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	

<b>3. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5] Recurring Debates in Social Thought	
SOCI 5809 [0.5] The Logic of the Research Process	
<b>4. 2.0 credit in</b> approved electives, chosen in consultation with the student's advisor	2.0
<b>5. 1.0 credit in:</b>	1.0
SOCI 5908 [1.0] M.A. Research Essay (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

### M.A.Sc. Aerospace Engineering with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.5 credits in</b> courses offered by the OCIMAE.	1.5
<b>4. Participation in the Mechanical and Aerospace Engineering seminar series</b>	
<b>5. 2.5 credits in:</b>	2.5
MECH 5909 [2.5] M.A.Sc. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

### M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.5 credits in</b> courses	1.5
<b>4. 2.5 credits in:</b>	2.5
SYSC 5909 [2.5] M.A.Sc. Thesis (in the area of climate change)	
<b>Total Credits</b>	<b>5.0</b>

### M.A.Sc. Environmental Engineering with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.5 credits in</b> courses, with at least 0.5 credit from two different areas of study listed below outside the area of EIA, Sustainability and Climate Change	1.5
<b>4. 0.0 credit in:</b>	
ENVE 5800 [0.0] Master's Seminar (participation in the graduate student seminar series)	
<b>5. 2.5 credits in:</b>	2.5
ENVE 5909 [2.5] Master's Thesis (in the specialization)	

6. Note: no more than 0.5 credit may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301

<b>Total Credits</b>	<b>5.0</b>
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### M.A.Sc. Materials Engineering with Collaborative Specialization in Climate Change (5.0 credits)

**Requirements:**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 1.5 credits in courses offered by the OCIMAE.</b>	<b>1.5</b>
<b>4. Participation in the Mechanical and Aerospace Engineering seminar series</b>	
<b>5. 2.5 credits in:</b>	<b>2.5</b>
MECH 5909 [2.5]      M.A.Sc. Thesis (in the specialization)	

<b>Total Credits</b>	<b>5.0</b>
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### M.A.Sc. Mechanical Engineering with Collaborative Specialization in Climate Change (5.0 credits)

**Requirements:**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 1.5 credits in courses offered by the OCIMAE.</b>	<b>1.5</b>
<b>4. Participation in the Mechanical and Aerospace Engineering seminar series</b>	
<b>5. 2.5 credits in:</b>	<b>2.5</b>
MECH 5909 [2.5]      M.A.Sc. Thesis (in the specialization)	

<b>Total Credits</b>	<b>5.0</b>
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### M.B.A. with Collaborative Specialization in Climate Change (8.5 credits)

**Requirements:**

<b>1. 1.0 credit in</b>	<b>1.0</b>
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 0.25 credit in</b>	<b>0.25</b>
BUSI 5108 [0.25]      Sustainable Business Development	
<b>4. 1.0 credit in elective specialization courses designated as having sufficient climate change content, within the School of Business or elsewhere, with permission of the School of Business.</b>	<b>1.0</b>
<b>5. 4.25 credits in compulsory core courses</b>	<b>4.25</b>
<b>6. 1.0 credit in elective courses</b>	<b>1.0</b>
<b>7. 1.0 credit in:</b>	<b>1.0</b>
BUSI 5999 [1.0]      Internship <sup>1</sup>	
<b>8. 0.0 credit in</b>	
BUSI 5998 [0.0]      MBA Skills Workshop <sup>2</sup>	

<b>Total Credits</b>	<b>8.5</b>
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<sup>1</sup> Students with less than two (2) years of professional employment experience must successfully complete BUSI 5999 [1.0] Internship in order to graduate. Students with two or more years work experience may apply for an exemption.

<sup>2</sup> Non-credit required skills workshop.

### M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Climate Change (4.5 credits)

**Requirements - project pathway (4.5 credits)**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	<b>0.0</b>
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
ELEC 5302 [0.5]      Renewable and Distributed Energy Resource Technologies	
SERG 5001 [0.5]      Sustainable Energy Policy for Engineers	
SERG 5003 [0.5]      Energy Evaluation and Assessment Tools	
SYSC 5104 [0.5]      Methodologies For Discrete-Event Modeling And Simulation	
or approved Advanced Topic in the area of climate change	
<b>4. 2.5 credits in courses</b>	<b>2.5</b>
<b>5. 0.5 credit in:</b>	<b>0.5</b>
SYSC 5900 [0.5]      Systems Engineering Project (in the area of climate change)	

<b>Total Credits</b>	<b>4.5</b>
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**Requirements - coursework pathway (4.5 credits)**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	<b>0.0</b>
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
ELEC 5302 [0.5]      Renewable and Distributed Energy Resource Technologies	
SERG 5001 [0.5]      Sustainable Energy Policy for Engineers	
SERG 5003 [0.5]      Energy Evaluation and Assessment Tools	
SYSC 5104 [0.5]      Methodologies For Discrete-Event Modeling And Simulation	
or approved Advanced Topic in the area of climate change	
<b>4. 3.0 credits in courses</b>	<b>3.0</b>

<b>Total Credits</b>	<b>4.5</b>
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### M.Eng. Environmental Engineering with Collaborative Specialization in Climate Change (5.0 credits)

**Requirements - Project pathway**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]      Climate Seminar Series	

<b>3. 0.5 credit from:</b>	0.5
ENVE 5105 [0.5] Atmospheric Aerosols	
ENVE 5200 [0.5] Climate Change and Engineering	
ENVE 5201 [0.5] Geo-Environmental Engineering	
ENVE 5205 [0.5] Sludge Treatment and Disposal	
ENVJ 5908 [0.5] Anaerobic Digestion	
ENVJ 5212 [0.5] Climate Change Impacts on Water Resources	
or approved Special Topics in the area of climate change	
<b>4. 2.5 credits in courses, with at least 0.5 credit from two different areas of study listed below outside the area of EIA, Sustainability and Climate Change</b>	2.5
<b>5. 0.0 credit in:</b>	
ENVE 5800 [0.0] Master's Seminar	
<b>6. 1.0 credit in:</b>	1.0
ENVE 5900 [1.0] Environmental Engineering Project (in the specialization)	
<b>Note: no more than 1.0 credit may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301</b>	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.5 credits from:</b>	1.5
ENVE 5105 [0.5] Atmospheric Aerosols	
ENVE 5200 [0.5] Climate Change and Engineering	
ENVE 5201 [0.5] Geo-Environmental Engineering	
ENVE 5205 [0.5] Sludge Treatment and Disposal	
ENVJ 5908 [0.5] Anaerobic Digestion	
ENVJ 5212 [0.5] Climate Change Impacts on Water Resources	
or approved Special Topics in the area of climate change	
<b>4. 2.5 credits in courses, with at least 0.5 credit from two different areas of study listed below outside the area of EIA, Sustainability and Climate Change</b>	2.5
<b>Note: no more than 1.5 credits may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301</b>	
<b>Total Credits</b>	<b>5.0</b>

### M.A. Political Economy with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	1.0
PECO 5000 [0.5] Theories of Political Economy	
PECO 5001 [0.5] Methodologies of Political Economy	
<b>4. 2.0 credits in:</b>	2.0
PECO 5909 [2.0] M.A. Thesis (in the specialization, including an oral examination)	

**5. 1.0 credit in** approved graduate level electives (see Selection of Courses, below) <sup>1</sup> 1.0

**Total Credits** **5.0**

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	0.0
<b>3. 1.0 credit in:</b>	1.0
PECO 5000 [0.5] Theories of Political Economy	
PECO 5001 [0.5] Methodologies of Political Economy	
<b>4. 1.0 credit in:</b>	1.0
PECO 5908 [1.0] Research Essay (in the specialization)	
<b>5. 2.0 credits in</b> approved graduate level electives (see Selection of Courses, below) <sup>1</sup> 2.0	
<b>Total Credits</b>	<b>5.0</b>

<sup>1</sup> Up to one (1.0) credit may be taken at the 4000 (honours undergraduate) level.

### Master of Public Policy and Administration with Collaborative Specialization in Climate Change (7.0 credits)

#### Requirements - coursework pathway (7.0 credits)

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 4.5 credits in core courses:</b>	4.5
PADM 5120 [0.5] Modern Challenges to Governance	
PADM 5121 [0.5] Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5] Public Management: Principles and Approaches	
PADM 5123 [0.5] Public Management in Practice	
PADM 5125 [0.5] Qualitative Methods for Public Policy	
PADM 5126 [0.5] Quantitative Methods for Public Policy	
PADM 5127 [0.5] Microeconomics for Policy Analysis	
PADM 5128 [0.5] Macroeconomics for Policy Analysis	
PADM 5129 [0.5] Capstone Course	
<b>4. 1.0 credits in</b> approved climate change electives (see School website for details) 1.0	
<b>5. 0.5 credit in</b> approved electives (see School website for details) 0.5	
<b>Total Credits</b>	<b>7.0</b>

#### Requirements - research essay pathway (7.0 credits)

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 4.5 credits in core courses:</b>	4.5
PADM 5120 [0.5] Modern Challenges to Governance	

PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
PADM 5908 [1.0]	Research Essay (in the Specialization)	
<b>5. 0.5 credit in</b> approved electives (see School website for details)		<b>0.5</b>
<b>Total Credits</b>		<b>7.0</b>

### Master of Public Policy - Sustainable Energy and the Environment with Collaborative Specialization in Climate Change (6.0 credits)

#### Requirements - Coursework pathway:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		<b>1.5</b>
SERG 5002 [0.5]	Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
PADM 5510 [0.5]	Energy Economics	
<b>7. 0.5 credit in:</b>		<b>0.5</b>
PADM 5515 [0.5]	Sustainable Energy Policy or PADM 5615 [0.5] Politics and Policy of Energy in Canada	
<b>8. 2.0 credits from</b> Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor		<b>2.0</b>
<b>Total Credits</b>		<b>6.0</b>

#### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		<b>1.5</b>
SERG 5002 [0.5]	Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	

SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
PADM 5510 [0.5]	Energy Economics	
<b>7. 0.5 credit in:</b>		<b>0.5</b>
PADM 5515 [0.5]	Sustainable Energy Policy or PADM 5615 [0.5] Politics and Policy of Energy in Canada	
<b>6. 1.0 credit from</b> Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor		<b>1.0</b>
<b>8. 1.0 credit in:</b>		<b>1.0</b>
PADM 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>6.0</b>

#### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		<b>1.5</b>
SERG 5002 [0.5]	Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
PADM 5510 [0.5]	Energy Economics	
<b>7. 0.5 credit in:</b>		<b>0.5</b>
PADM 5515 [0.5]	Sustainable Energy Policy or PADM 5615 [0.5] Politics and Policy of Energy in Canada	
<b>8. 2.0 credits in:</b>		<b>2.0</b>
SERG 5909 [2.0]	MA Sustainable Energy Thesis (in the specialization)	
<b>Total Credits</b>		<b>6.0</b>

#### Notes:

1. Courses must be appropriate to the student's qualifications and selected with the approval of the student's program supervisor.

### M.Eng. Sustainable Energy with Collaborative Specialization in Climate Change (5.0 Credits)

#### Requirements:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		<b>1.5</b>

SERG 5001 [0.5]	Sustainable Energy Policy for Engineers	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>		
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>		0.5
<b>Mechanical Engineering Focus:</b>		
Mechanical Energy Conversion courses (listed below), or Sustainable Energy Policy courses		
or		
<b>Electrical Engineering focus:</b>		
Efficient Electrical Energy Systems courses (listed below) or Sustainable Energy Policy courses		
<b>6. 2.0 credits in:</b>		2.0
<b>Mechanical Engineering focus:</b>		
Graduate-level MECH courses		
or		
<b>Electrical Engineering focus:</b>		
Graduate-level ELEC, SYSC or EACJ courses		
<b>Total Credits</b>		<b>5.0</b>

### M.Sc. Management with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		1.5
BUSI 5980 [0.5]	Foundations of Management Theory and Research	
BUSI 5981 [0.5]	Statistics for Business Research	
BUSI 5982 [0.5]	Research Methodology in Business	
<b>4. 0.5 credit from:</b>		0.5
BUSI 5983 [0.5]	Qualitative Research Design	
BUSI 5984 [0.5]	Quantitative Research Design	
<b>5. 0.0 credit in:</b>		
BUSI 5987 [0.0]	M.Sc. Thesis Tutorial	
<b>6. 2.0 credits in:</b>		2.0
BUSI 5989 [2.0]	M.Sc. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits):

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in approved electives</b>		1.0
<b>4. 1.5 credits in:</b>		1.5
BUSI 5980 [0.5]	Foundations of Management Theory and Research	
BUSI 5981 [0.5]	Statistics for Business Research	
BUSI 5982 [0.5]	Research Methodology in Business	
<b>4. 0.5 credit from:</b>		0.5
BUSI 5983 [0.5]	Qualitative Research Design	

BUSI 5984 [0.5]	Quantitative Research Design	
<b>6. 1.0 credit in:</b>		1.0
BUSI 5988 [1.0]	M.Sc. Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### Regulations

See the General Regulations section of this Calendar and the regulations of the participating unit.

### Admission

Admission to the collaborative master's program in Climate Change is available to master's students who are admitted in one of the participating master's programs. To apply to one of the participating master's programs, please visit the Graduate Students Admissions page.

### Climate Change (CLIM) Courses

#### CLIM 5000 [1.0 credit]

##### Climate Collaboration

A seminar on the climate crisis from an interdisciplinary perspective. Drawing on a range of disciplinary approaches from the humanities, social sciences, public policy, engineering and natural science, students will engage with the many factors bearing on the climate crisis and how to address it.

#### CLIM 5800 [0.0 credit]

##### Climate Seminar Series

A series of seminars presented by researchers and practitioners in the area of climate change. To complete this course, a student must attend six seminars.

## Clinical Trials and Regulatory Affairs

This section presents the requirements for programs in:

- **M.Sc. Clinical Trials and Regulatory Affairs**

### Program Requirements

#### M.Sc. Clinical Trials and Regulatory Affairs (4.5 credits)

##### Requirements:

##### 1. 0.0 credit in:

HLTH 5101 [0.0]	Statistical Software and its Application to Health Sciences Primer (must be completed within two weeks of first semester)
HLTH 5811 [0.0]	Clinical Trials Primer (must be completed within two weeks of first semester)

##### 2. 4.0 credits in: 4.0

HLTH 5812 [0.5]	Clinical Trials 1: Introduction
HLTH 5813 [0.5]	Clinical Trials 2
HLTH 5814 [0.5]	Assessment and Patient Safety for Clinical Trials
HLTH 5815 [0.5]	Principles of Data Management and Analysis in Clinical Trials
HLTH 5816 [0.5]	Government Regulatory Processes
HLTH 5817 [0.5]	Government, Research Organizations, and Industry
HLTH 5818 [0.5]	Ethics, Community and Patient Engagement
HLTH 5819 [0.5]	Clinical Trials Protocols, Operations and Management

##### 3. 0.5 credit from: 0.5

BIOC 4708 [0.5]	Principles of Toxicology
CHEM 4305 [0.5]	Environmental Chemistry and Toxicology
HLTH 5150 [0.5]	Statistics for Health Sciences
HLTH 5151 [0.5]	Principles of Epidemiology
HLTH 5350 [0.5]	New Health Technologies
HLTH 5700 [0.5]	Special Topics in Biostatistics and Epidemiology
HLTH 5704 [0.5]	Special Topics in the Science of Disease
HLTH 5821 [0.5]	Effective Communication in Clinical Research and Regulatory Environments
STAT 5602 [0.5]	Analysis of Categorical Data
STAT 5603 [0.5]	Reliability and Survival Analysis

**Total Credits 4.5**

#### M.Sc. Clinical Trials and Regulatory Affairs (practicum pathway - 6.0 credits)

##### Requirements:

##### 1. 0.0 credit in:

HLTH 5101 [0.0]	Statistical Software and its Application to Health Sciences Primer (must be completed within two weeks of first semester)
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HLTH 5811 [0.0]	Clinical Trials Primer (must be completed within two weeks of first semester)
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##### 2. 4.0 credits in: 4.0

HLTH 5812 [0.5]	Clinical Trials 1: Introduction
HLTH 5813 [0.5]	Clinical Trials 2
HLTH 5814 [0.5]	Assessment and Patient Safety for Clinical Trials
HLTH 5815 [0.5]	Principles of Data Management and Analysis in Clinical Trials
HLTH 5816 [0.5]	Government Regulatory Processes
HLTH 5817 [0.5]	Government, Research Organizations, and Industry
HLTH 5818 [0.5]	Ethics, Community and Patient Engagement
HLTH 5819 [0.5]	Clinical Trials Protocols, Operations and Management

##### 3. 0.5 credit from: 0.5

BIOC 4708 [0.5]	Principles of Toxicology
CHEM 4305 [0.5]	Environmental Chemistry and Toxicology
HLTH 5150 [0.5]	Statistics for Health Sciences
HLTH 5151 [0.5]	Principles of Epidemiology
HLTH 5350 [0.5]	New Health Technologies
HLTH 5700 [0.5]	Special Topics in Biostatistics and Epidemiology
HLTH 5704 [0.5]	Special Topics in the Science of Disease
HLTH 5821 [0.5]	Effective Communication in Clinical Research and Regulatory Environments
STAT 5602 [0.5]	Analysis of Categorical Data
STAT 5603 [0.5]	Reliability and Survival Analysis

##### 4. 1.5 credits in: 1.5

HLTH 5820 [1.5]	Clinical Trials Practicum
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**Total Credits 6.0**

### Admission

#### M.Sc. Clinical Trials and Regulatory Affairs - Practicum pathway:

- 4-year (honours) bachelor degree or equivalent professional degree in a related discipline
- minimum B+ (77%) average over last 2 years of study (or last 20 one-term courses)
- one undergraduate course in statistics or equivalent (desirable)

#### M.Sc. Clinical Trials and Regulatory Affairs - Non-practicum pathway:

- in addition to the admission requirements listed above, non-practicum pathway applicants must possess two years of experience in clinical trials.

Applicants must submit their transcripts, a professional resume, two or three letters of recommendation, a statement of intent outlining their career goals and their alignment with the learning outcomes and degree level expectations of the program, and provide information about relevant work experience.

## **Health Sciences (HLTH) Courses**

### **HLTH 5100 [0.5 credit]**

#### **Fundamentals of Research Methods**

Experimental design, statistical analysis and interpretation of results in health science research, principles and methods of epidemiology, fundamentals of research ethics.

Includes: Experiential Learning Activity

Prerequisite(s): university-level statistics.

### **HLTH 5101 [0.0 credit]**

#### **Statistical Software and its Application to Health Sciences Primer**

Introduction to statistical softwares used to analyze health research data. Data management topics include data entry, manipulation, and elementary statistical analyses using SAS, SPSS, Stata and R. Other topics include privacy/maintaining security of health datasets. For students without strong backgrounds in biostatistics/data handling.

Includes: Experiential Learning Activity

### **HLTH 5150 [0.5 credit]**

#### **Statistics for Health Sciences**

Statistical methods commonly used in analyses of health data. This applied course covers topics related to descriptive and graphical methods, tests of hypotheses in both paired and independent samples, linear regression, survival analysis, and logistic regression.

Includes: Experiential Learning Activity

Lecture three hours a week, lab/workshop three hours a week.

### **HLTH 5151 [0.5 credit]**

#### **Principles of Epidemiology**

Introduction to epidemiologic concepts and methods.

Different types of epidemiological study designs.

Fundamental concepts of: definitions and measures of disease frequency and effects, causality, bias, sample size, confounding and interaction.

Includes: Experiential Learning Activity

### **HLTH 5201 [0.5 credit]**

#### **Fundamentals of Policy I: Policy Analysis**

Policy analysis and policy processes with an emphasis on the stages of the policy process, as well as the influences of institutions, ideas and interests.

### **HLTH 5202 [0.5 credit]**

#### **Fundamentals of Policy II: The Health Sector**

Canadian health policies and programs with emphasis on the economics, politics and public administration of the healthcare sector.

### **HLTH 5300 [0.5 credit]**

#### **Knowledge Translation**

The application of knowledge translation in the formulation of policy and the development of skills required to maximize the impact of scientific findings through real world programs and policies and communication skills for diverse audiences.

Precludes additional credit for NEUR 5801.

Also offered at the undergraduate level, with different requirements, as HLTH 4701, for which additional credit is precluded.

### **HLTH 5350 [0.5 credit]**

#### **New Health Technologies**

Overview of new and emerging health technologies, including medical and assistive devices, diagnostics and screening, genetics, reproduction, tissue regeneration, imaging, and health informatics. Health technology assessment methods and issues. Regulatory, ethical and social implications; considerations in the developing world.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as HLTH 4102, for which additional credit is precluded.

### **HLTH 5401 [0.5 credit]**

#### **Interdisciplinary Problems in Health**

Development of an understanding of the scope and interdisciplinary nature of issues that impact the health of Canadians is the focus of this course.

Precludes additional credit for HLTH 5903.

### **HLTH 5402 [0.5 credit]**

#### **Biological and Social Fundamentals of Health**

What comprises a healthy body and mind? This course addresses the psycho-social and biological mechanisms that may interact to determine health outcomes. The course examines complex relationships between social, environmental, and biological factors underlying some of the most important and emerging health concerns today.

### **HLTH 5403 [0.5 credit]**

#### **Host-Pathogen Interactions**

Advanced cellular and molecular mechanisms governing host-pathogen interactions and their contribution to disease. Exploration of immune signaling and recognition, virulence factors, antimicrobial resistance and research techniques used in this field.

Prerequisite(s): Permission of the department.

Also offered at the undergraduate level, with different requirements, as HLTH 4304, for which additional credit is precluded.

**HLTH 5504 [1.0 credit]****Interdisciplinary Health Research Project - Group**

Student teams will collaborate on a research project that addresses a real-world health concern, supervised by a cross-disciplinary team of faculty. Students must be continually registered in this course throughout their degree program (five terms.).

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5502 (no longer offered), HLTH 5503(no longer offered), HLTH 5505.

**HLTH 5505 [1.0 credit]****Interdisciplinary Health Research Project – Individual**

An independent research project that addresses a real-world health concern, supervised by a faculty member and advised by a cross-disciplinary team of experts. Students must be continually registered in this course throughout their degree program (five terms).

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5502(no longer offered), HLTH 5503(longer offered), HLTH 5504.

Prerequisite(s): permission of the Faculty supervisor and the Department of Health Sciences.

**HLTH 5506 [1.0 credit]****Field Research and Placement**

This practicum supports students in gaining relevant and practical experience through applying course learning at approved organizations.

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5801.

Prerequisite(s): Completion of two terms of the MSc HSTP program, permission of the department and at the discretion of the practicum supervisor.

Schedules may vary depending on the field placement site, but students are required to spend a minimum of 32 weeks over summer, fall and winter in the second year.

**HLTH 5507 [1.0 credit]****Interdisciplinary Health Research Project**

Research project that addresses a real-world health concern, supervised by a faculty member and advised by a cross-disciplinary team of experts. Students must be continually registered in this course throughout their degree program (five terms).

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5504, HLTH 5505.

Prerequisite(s): Permission of the Faculty supervisor and the Department of Health Sciences.

**HLTH 5600 [0.25 credit]****Special Topics in Biostatistics and Epidemiology**

Selected topics in biostatistics and epidemiology, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

Includes: Experiential Learning Activity

**HLTH 5601 [0.25 credit]****Special Topics in Health Policy and Administration**

Selected topics in health policy and administration, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5602 [0.25 credit]****Special Topics: Social and Behavioural**

Selected topics in the social and behavioural sciences, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5603 [0.25 credit]****Special Topics in Environmental Health**

Selected topics in environmental health, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5604 [0.25 credit]****Special Topics in the Science of Disease**

Selected topics in the science of disease, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5605 [0.25 credit]****Special Topics: Engineering, Design and Computer Science**

Selected topics in applications of engineering, design or computer science in health, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5700 [0.5 credit]****Special Topics in Biostatistics and Epidemiology**

Selected topics in biostatistics and epidemiology, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

Includes: Experiential Learning Activity

**HLTH 5701 [0.5 credit]****Special Topics in Health Policy and Administration**

Selected topics in health policy and administration, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5702 [0.5 credit]****Special Topics: Social and Behavioural**

Selected topics in the social and behavioural sciences, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5703 [0.5 credit]****Special Topics in Environmental Health**

Selected topics in environmental health, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5704 [0.5 credit]****Special Topics in the Science of Disease**

Selected topics in the science of disease, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5705 [0.5 credit]****Special Topics: Engineering, Design and Computer Science**

Selected topics in applications of engineering, design or computer science in health, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5800 [0.5 credit]****Directed Studies in Health: Science, Technology and Policy**

Individualized instruction in selected aspects of specialized Health Sciences subjects not covered by other graduate courses. Students are permitted to only take this course once per program. Their project supervisor(s) may supervise if the research to be conducted is different from their thesis/project research.

Prerequisite(s): permission of the department.

**HLTH 5801 [0.5 credit]****Health: Science, Technology and Policy Practicum**

This practicum supports students in gaining relevant and practical experience through applying course learning at approved organizations. Students are responsible for arranging the placement with an external partner where the practicum will be held, preparing a learning contract, and completing a field-based project deliverable.

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5506.

Prerequisite(s): Completion of two semesters of the MSc in HSTP program, permission of the department and at the discretion of the practicum supervisor. Students may not be supervised by their MSc research supervisor(s) and are limited to one practicum per program.

**HLTH 5811 [0.0 credit]****Clinical Trials Primer**

Overview of the vast area of clinical trials of drugs and devices, and principles of informed consent, regulatory requirements, rigorous documentation, analysis, and reporting. Students will also work on certificates in biomedical ethics, good clinical practice, and others, for example from CITI Canada.

**HLTH 5812 [0.5 credit]****Clinical Trials 1: Introduction**

Fundamentals of trials of health products and different phases and types of clinical trials. Investigator vs. sponsor-initiated trials, different regulatory agencies, the use of randomization, blinding, registration regulatory requirements, rigorous documentation, and common trials.

**HLTH 5813 [0.5 credit]****Clinical Trials 2**

Other trial designs, recruitment of patients, data collection and quality control, interim monitoring, audits, inspections, timelines.

**HLTH 5814 [0.5 credit]****Assessment and Patient Safety for Clinical Trials**

The importance of efficacy and safety measurements, biosamples, pharmacokinetics, pharmacodynamics, drug mechanism of action, reporting of harm, Data and Safety Monitoring Board, pharmacovigilance, consideration of special populations. Good clinical practice, good medical practice, and good laboratory practice.

Includes: Experiential Learning Activity

**HLTH 5815 [0.5 credit]****Principles of Data Management and Analysis in Clinical Trials**

Randomization, biomarkers, endpoints, estimands, sample size requirements, random error and bias, multiple testing correction, intent-to-treat versus per-protocol, equipoise and stopping rules for trials, database development, validation and reporting/transferring, development of statistical analysis plans, considerations around missing data.

**HLTH 5816 [0.5 credit]****Government Regulatory Processes**

Regulatory agencies (Health Canada, US Food and Drug Administration, European Medicines Agency) will be compared. Harmonization efforts of national drug approval agencies, timelines for an investigational New Drug Application including labeling, accelerated approval, breakthrough designation, orphan drugs, and biologics licence application.

**HLTH 5817 [0.5 credit]****Government, Research Organizations, and Industry**

Overview of regulatory requirements of pharmaceutical companies, contracting research organizations, and communication with regulatory agencies. Negotiation and collaboration between sectors, incentives such as FDA priority review vouchers, project management, manufacturing and distribution, phase IV post-marketing and continued monitoring, pharmacovigilance and post-marketing changes.

**HLTH 5818 [0.5 credit]****Ethics, Community and Patient Engagement**

Patient engagement, equipoise, informed consent, ethics board, monitoring, reporting/release of data in the literature, compassionate/expanded access; patient foundations, liaisons and advocates. Engaging with Indigenous communities and special populations. Considerations around translational research, generics, biosimilars, and labeling.

**HLTH 5819 [0.5 credit]****Clinical Trials Protocols, Operations and Management**

Clinical protocols, electronic case report forms and guidelines, data management plan, monitoring plan, pharmacy manual, standard operating procedures, manual of operating procedures, delegation of authority logs and training logs. Leadership, logistics, budgeting.

**HLTH 5820 [1.5 credit]****Clinical Trials Practicum**

Capstone credit course required for students in the practicum pathway. Experiential learning at a clinical site, regulatory site, CRO, or similar institution involved in clinical trials. Students will demonstrate the knowledge and skills gained and will present on their experience, efforts and lessons learned.

Includes: Experiential Learning Activity

**HLTH 5821 [0.5 credit]****Effective Communication in Clinical Research and Regulatory Environments**

This course equips students with the skills to convey complex information in decision-based discussions and explain complex regulatory environments, preparing them for impactful roles in clinical trial research.

**HLTH 5901 [0.5 credit]****Advanced Topics in Interdisciplinary Health Sciences**

Discussion of current health problems and exploration of innovative interdisciplinary solutions. Development of skills required to perform critical analyses of health research to evaluate the quality, interpret the findings, and assess the impact of health sciences literature across disciplines. Precludes additional credit for HLTH 5903.

**HLTH 5902 [0.5 credit]****Seminars in Interdisciplinary Health Sciences for MSc**

Development of scientific communication skills through attendance at interdisciplinary seminars. Topics have specific or broad relevance to health sciences. Graded SAT/UNS.

**HLTH 5903 [0.5 credit]****Current Topics in Interdisciplinary Health Sciences**

Exploration of current health challenges and opportunities, and the role of interdisciplinary approaches to understand health and disease. Development of skills required for communication, collaboration, literature appraisal. Includes student, faculty, and invited seminar speakers.

Precludes additional credit for HLTH 5401, HLTH 5901. Prerequisite(s): Permission of the Department of Health Sciences.

**HLTH 5905 [0.0 credit]****Final Research Seminar Presentation for MSc**

Final seminar of MSc thesis research. Seminar presentation should occur within one month of the final oral thesis defence.

Includes: Experiential Learning Activity

**HLTH 5906 [0.0 credit]****Research Seminar Presentation for MSc**

Seminar of MSc thesis research. Seminar presentation should occur after two terms in the MSc, and prior to enrolment in the second year.

Prerequisite(s): permission of the department.

**HLTH 5909 [4.0 credits]****MSc Thesis**

Includes: Experiential Learning Activity

**HLTH 6902 [0.5 credit]****Seminars in Interdisciplinary Health Sciences**

Development of scientific communication skills through attendance at interdisciplinary seminars. Topics have specific or broad relevance to health sciences. Graded SAT/UNS.

**HLTH 6903 [0.5 credit]****Grant Proposals and Ethics**

Advanced course in writing successful grant proposals in Tri-Council (CIHR, NSERC, SSHRC) formats. Ethics associated with conducting health sciences research, including the preparation of ethics proposals for human and animal studies in health sciences research.

Includes: Experiential Learning Activity

**HLTH 6904 [0.0 credit]****Mid-Program Defence**

Departmental seminar and Graduate Advisory Committee meeting on PhD research including results to date and future research aims and directions, and on field-specific knowledge.

Includes: Experiential Learning Activity

**HLTH 6905 [0.0 credit]****Final Research Seminar Presentation**

Final seminar of PhD thesis research. Seminar presentation should occur within one month of the final oral thesis defence.

Includes: Experiential Learning Activity

**HLTH 6906 [0.0 credit]****Research Seminar Presentation for PhD**

Seminar of PhD thesis research. Seminar presentation should occur after two terms in the PhD in Health Sciences, and prior to enrolment in the second year.

Prerequisite(s): Permission of the department.

**HLTH 6909 [0.0 credit]****PhD Thesis**

Includes: Experiential Learning Activity

# Cognitive Science

This section presents the requirements for programs in:

- Master of Cognitive Science
- Master of Cognitive Science with Collaborative Specialization in Data Science
- Master of Cognitive Science with Collaborative Specialization in Digital Humanities
- Ph.D. Cognitive Science

## Program Requirements

### Master of Cognitive Science (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
CGSC 5100 [0.5]	Issues in Cognitive Science
<b>2. 0.5 credit from:</b>	0.5
CGSC 5101 [0.5]	Experimental Methods and Statistics
or CGSC 5103 [0.5]	Formal Methods
<b>3. 1.5 credits in</b> cognitive science or other courses, from at least two different cognitive disciplines, selected with approval of the thesis supervisor and the graduate supervisor.	1.5
<b>4. 2.5 credits in:</b>	2.5
CGSC 5909 [2.5]	M. Cog. Thesis

5. Students are required to present their research at the Cognitive Science Student Spring Conference (in either year).

**Total Credits** 5.0

#### Requirements - Research Project pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
CGSC 5100 [0.5]	Issues in Cognitive Science
<b>2. 0.5 credit in:</b>	0.5
CGSC 5101 [0.5]	Experimental Methods and Statistics
or CGSC 5103 [0.5]	Formal Methods
<b>3. 1.5 credits from:</b>	1.5
CGSC 5001 [0.5]	Cognition and Artificial Cognitive Systems
CGSC 5002 [0.5]	Experimental Research in Cognition
CGSC 5003 [0.5]	Language and Cognition
CGSC 5004 [0.5]	Cognition and Conceptual Issues
CGSC 5005 [0.5]	Cognition and Neuroscience
<b>4. 1.0 credit in:</b>	1.0
CGSC 5908 [1.0]	Research Project
<b>5. 1.5 credits in</b> cognitive science or other courses selected with approval of the project supervisor and graduate supervisor.	1.5

6. Students are required to present their research at the Cognitive Science Student Spring Conference (in either year)

**Total Credits** 5.0

**Guidelines for Completion of the M.Cog.Sc. Degree**  
The degree is expected to take no more than six terms to complete. Students will enroll in courses while also conducting research.

### Master of Cognitive Science with Collaborative Specialization in Data Science (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 0.5 credit in:</b>	0.5
CGSC 5100 [0.5]	Issues in Cognitive Science
<b>3. 0.5 credit in:</b>	0.5
CGSC 5101 [0.5]	Experimental Methods and Statistics
<b>4. 1.0 credit in</b> CGSC or other approved courses, from two different cognitive disciplines, selected in consultation with the graduate supervisor.	1.0
<b>5. 2.5 credits in:</b>	2.5
CGSC 5909 [2.5]	M. Cog. Thesis (The thesis must be approved as fulfilling the data science requirement and be supervised by a faculty member working in a data science related field.)

6. Preparation of research for presentation at the Carleton Cognitive Science Spring Conference.

**Total Credits** 5.0

#### Requirements - Research Project pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 0.5 credit in:</b>	0.5
CGSC 5100 [0.5]	Issues in Cognitive Science
<b>3. 0.5 credit in:</b>	0.5
CGSC 5101 [0.5]	Experimental Methods and Statistics
<b>4. 1.5 credits from:</b>	1.5
CGSC 5001 [0.5]	Cognition and Artificial Cognitive Systems
CGSC 5002 [0.5]	Experimental Research in Cognition
CGSC 5003 [0.5]	Language and Cognition
CGSC 5004 [0.5]	Cognition and Conceptual Issues
CGSC 5005 [0.5]	Cognition and Neuroscience
<b>5. 1.0 credit in</b> CGSC or other approved courses selected in consultation with the graduate supervisor.	1.0
<b>6. 1.0 credit in:</b>	1.0
CGSC 5908 [1.0]	Research Project (Project must be approved as fulfilling the data science requirement and be supervised by a faculty member working in a data science related field.)

7. Preparation of research for presentation at the Cognitive Science Spring Conference.

**Total Credits** 5.0

## Master of Cognitive Science with Collaborative Specialization in Digital Humanities (6.0 credits)

### Requirements - Thesis pathway (6.0 credits)

<b>1. 0.5 credit in:</b>	0.5
CGSC 5100 [0.5]	Issues in Cognitive Science
<b>2. 0.5 credit from:</b>	0.5
CGSC 5101 [0.5]	Experimental Methods and Statistics
or CGSC 5103 [0.5]	Formal Methods
<b>3. 1.5 credits in</b>	1.5
CGSC or other courses, from at least two different cognitive disciplines, selected with approval of the thesis supervisor and the graduate supervisor.	
<b>4. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>5. 0.5 credit from:</b>	0.5
DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities
DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities
or annually-listed DIGH course	
<b>6. 0.0 credit in:</b>	
DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>7. 2.5 credits in:</b>	2.5
CGSC 5909 [2.5]	M. Cog. Thesis (in the specialization)
8. Students are required to present their research at the Cognitive Science Student Spring Conference (in either year)	
<b>Total Credits</b>	<b>6.0</b>

### Requirements - Research Project pathway (6.0 credits)

<b>1. 0.5 credit in:</b>	0.5
CGSC 5100 [0.5]	Issues in Cognitive Science
<b>2. 0.5 credit in:</b>	0.5
CGSC 5101 [0.5]	Experimental Methods and Statistics
or CGSC 5103 [0.5]	Formal Methods
<b>3. 1.5 credits from:</b>	1.5
CGSC 5001 [0.5]	Cognition and Artificial Cognitive Systems
CGSC 5002 [0.5]	Experimental Research in Cognition
CGSC 5003 [0.5]	Language and Cognition
CGSC 5003 [0.5]	Language and Cognition
CGSC 5004 [0.5]	Cognition and Conceptual Issues
CGSC 5005 [0.5]	Cognition and Neuroscience
<b>4. 1.5 credits in</b>	1.5
CGSC or other courses selected with approval of the project supervisor and graduate supervisor.	
<b>5. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>6. 0.5 credit from:</b>	0.5
DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities
DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities
or annually-listed DIGH course	
<b>7. 0.0 credit in:</b>	

DIGH 5800 [0.0]	Digital Humanities: Professional Development
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<b>8. 1.0 credit in:</b>	1.0
CGSC 5908 [1.0]	Research Project (in the specialization)

9. Students are required to present their research at the Cognitive Science Student Spring Conference (in either year)	
<b>Total Credits</b>	<b>6.0</b>

## Ph.D. Cognitive Science (3.5 credits)

### Requirements:

<b>1. 0.5 credit in:</b>	0.5
CGSC 5100 [0.5]	Issues in Cognitive Science
<b>2. 0.5 credit in:</b>	0.5
CGSC 6801 [0.5]	Proseminar in Cognitive Science
<b>3. 0.5 credit in:</b>	0.5
CGSC 6002 [0.5]	Methodology Rotation I
<b>4. 0.5 credit in:</b>	0.5
CGSC 6003 [0.5]	Methodology Rotation II
<b>5. 0.0 credits in:</b>	0.0
CGSC 6909 [0.0]	Ph.D. Thesis
<b>6. 1.5 credits in</b>	1.5
cognition from two different cognitive disciplines, including at least 0.5 credit in cognitive neuroscience if not already completed.	
<b>Total Credits</b>	<b>3.5</b>

- Students are expected to present their research at the Cognitive Science Student Spring Conference during the first three years of their program.
- Course selection is with the approval of the Thesis Supervisor and the Graduate Supervisor of Cognitive Science.
- Any student planning a dissertation with an applied cognitive emphasis is required to work for at least one term at a facility approved by the student's research supervisor and the Director of the Cognitive Science Program. Such a facility may include any institution, governmental laboratory, corporation, hospital or educational centre conducting research in the area of the student's specialization. Students should complete this work while registered in either option:

### Methodology Rotation

CGSC 6002 [0.5]	Methodology Rotation I
CGSC 6003 [0.5]	Methodology Rotation II

### Ph.D. Thesis

CGSC 6909 [0.0]	Ph.D. Thesis
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### Methodology Rotation

The methodology rotation consists of two parts. Students spend one term in each of two laboratories or other research venues using two different methods for studying cognition (behavioural, linguistic-theoretic, computational, conceptual, neuroscientific).

The purpose of the methodology rotation is to give students sufficient background in two different approaches to cognition to allow the student to use work from these approaches in his or her own research.

Assignments will be as specified by each rotation supervisor. Each rotation will be graded separately by the rotation supervisor as either Satisfactory(S)/Unsatisfactory (U). In the event of a grade of U the student may repeat a rotation only once.

### **Prospectus, Prospectus Defence, Thesis and Defence**

When a student is ready to begin work on a thesis, the Graduate Supervisor approves a thesis committee which includes the thesis supervisor or co-supervisors, plus at least two additional members. The committee should include members from at least two different approaches to cognition. The Director of the Department of Cognitive Science is an ex officio member of the committee. Preparation of the thesis has two stages. First the student prepares a prospectus, which is examined at a prospectus defence on the subject matter of the thesis. Then the student prepares the thesis, which is defended at a public oral examination.

### **Prospectus**

The prospectus must describe the proposed research and review the relevant literature in the field of the research. The prospectus must be sufficiently detailed to allow the examining committee to judge the likelihood of a successful thesis ensuing from it. Preparation of the prospectus will follow the practices common in the Thesis Supervisor's area of research. The committee may add further requirements.

### **Prospectus Defence**

The prospectus is examined orally by a board consisting of the members of the thesis committee. The committee may add further examiners. The examination is a comprehensive examination of the thesis subject matter, to ensure that the student has a sound understanding of the context of his or her proposed research, and of appropriate methods, ethical considerations, and so on. The examining board will also consider the research that the student is proposing, which must be of sufficiently high quality and described in sufficient detail to allow the committee to judge whether, if completed successfully, it would be likely that the student would be awarded the degree. Should a student's prospectus be unacceptable, or the student fails the prospectus defence, the student may resubmit the prospectus and be reexamined once.

### **Thesis**

The completed thesis is examined orally by an examining board consisting at minimum of the thesis committee, an examiner at arm's length to the project from within Carleton University (the internal examiner) and an examiner from another university who is at arm's length to the student and the committee and who is a recognized expert in the area of the thesis (the external examiner). All university regulations apply.

### **Residence Requirement**

All Ph.D. candidates must be registered full-time in a minimum of six terms to satisfy the residence requirement.

### **Language Requirement**

A second language is required when relevant to the student's program of research. Whether a second

language is required and the level of proficiency expected is determined at the time of admission, based on the student's description of his or her proposed area of thesis research.

### **Milestones (to be completed by the end of the specified year)**

**First year:** Completion of CGSC 6801\* and CGSC 5100, and elective coursework. Spring Conference presentation.

**Second year:** Completion of remaining program coursework and the methodology rotations (CGSC 6002) and (CGSC 6003). Begin work on Prospectus. Spring Conference presentation.

**Third year:** Prospectus defence. Continue to work on thesis CGSC 6909 Ph.D. Thesis. Spring Conference Presentation.

**Fifth Year:** Thesis completion (CGSC 6909 Ph.D. Thesis) and defence.

\*Please note CGSC 6801 is offered in alternate years. Course to be completed in second year if it is not offered in the first year of program.

### **Regulations**

See the General Regulations section of this Calendar.

### **Admission**

The requirement for admission into the M.Cog.Sc. program is an honours bachelor's degree with an average of at least A-.

Applicants whose first language is not English, or who have not completed a previous degree at an English-language university, must demonstrate fluency in English as outlined in the General Regulations.

To be admitted, a candidate must submit a description of his or her proposed area of thesis research and a member of the core faculty must indicate in writing that he or she is willing to supervise the student.

### **Admission**

- Master's degree (or the equivalent) from one of the participating disciplines. An average of at least A- in courses in cognition is normally required.
- Applicants with a master's degree in one of the participating disciplines are normally admitted to a 10.0-credit program.
- Students eligible for admission to the 10.0 -credit program but with deficiencies may be required to take additional courses or may be directed to apply for the M. Cog.Sc.
- An overall score of 70 on the Canadian Academic English Language (CAEL) Assessment
- A TOEFL score of 230 CBT (computer-based test) or 580; or 86 IBT overall with a minimum score in each component of writing (22), speaking (22), reading (20) and listening (20).
- An overall IELTS score of 6.5, with a minimum of 6.0 in each band score; or

- An acceptable certification that the language of instruction in your most recently completed undergraduate or graduate degree was English.
- To be admitted, a candidate must submit a description of his or her proposed area of thesis research and a member of the core faculty must indicate in writing that he or she is willing to supervise the student.

## **Cognitive Science (CGSC) Courses**

### **CGSC 5001 [0.5 credit]**

#### **Cognition and Artificial Cognitive Systems**

An introduction to the contribution of artificial intelligence and computer modeling of cognitive processes to cognitive science.

### **CGSC 5002 [0.5 credit]**

#### **Experimental Research in Cognition**

An introduction to the contribution of experimental psychology to cognitive science.

### **CGSC 5003 [0.5 credit]**

#### **Language and Cognition**

An introduction to the contribution of theoretical linguistics and linguistic research to cognitive science.

Includes: Experiential Learning Activity

Also listed as ALDS 5301 and LING 5608.

### **CGSC 5004 [0.5 credit]**

#### **Cognition and Conceptual Issues**

An introduction to the contribution of philosophy of mind, philosophy of language, and other conceptual investigations to cognitive science.

### **CGSC 5005 [0.5 credit]**

#### **Cognition and Neuroscience**

An introduction to the contribution of neuroscience to cognitive science.

### **CGSC 5100 [0.5 credit]**

#### **Issues in Cognitive Science**

A survey of the central problems and issues of cognitive research to start the process of acquiring the interdisciplinary breadth required to understand research in cognitive science.

### **CGSC 5101 [0.5 credit]**

#### **Experimental Methods and Statistics**

An introduction to the design of experiments and the statistics needed to interpret data in cognitive science.

Also listed as HCIN 5400.

### **CGSC 5103 [0.5 credit]**

#### **Formal Methods**

The class introduces students to various formal methods relevant to cognitive science, possibly including (but not limited to) formal logic, the theory of computation, probability theory, decision theory.

Precludes additional credit for CGSC 5102.

Prerequisite(s): permission of the department.

Seminar.

### **CGSC 5303 [0.5 credit]**

#### **Linguistic Analysis, Culture and Cognition**

Universals of language from a cross-cultural perspective.

Study of lesser-known languages leading to critical

understanding of universal human concepts and

communication practices in culture-specific configurations.

Cross-linguistic analysis as a means to general

understanding of diversity and universality in human

cognition.

### **CGSC 5601 [0.5 credit]**

#### **Cognitive Architectures**

Cognitive architectures and how to evaluate them against human data; how to create cognitive models using cognitive architectures such as ACT-R.

Precludes additional credit for CGSC 5106 (no longer offered), CGSC 6004 (no longer offered).

Also offered at the undergraduate level, with different requirements, as CGSC 4601, for which additional credit is precluded.

### **CGSC 5605 [0.5 credit]**

#### **Hyperdimensional Cognitive Models**

Modelling cognition using artificial intelligence techniques such as reinforcement learning, vector-symbolic models, neural networks, and/or machine learning.

Also offered at the undergraduate level, with different requirements, as CGSC 4605, for which additional credit is precluded.

### **CGSC 5901 [0.5 credit]**

#### **Special Topics in Cognitive Science**

Seminar on current, important issues related to Cognition and Neuroscience, Philosophy, Computer Science, Linguistics and/or Psychology. Topics will vary from year to year.

### **CGSC 5907 [0.5 credit]**

#### **Independent Research**

Permission to register and approval of research plan must be obtained from the graduate supervisor. A final research report must be filed in the departmental office prior to submission of course grade. The course may be repeated for credit.

Includes: Experiential Learning Activity

**CGSC 5908 [1.0 credit]****Research Project**

Students may enroll in multiple sections of this course (as necessary) to complete their Research credits.

Includes: Experiential Learning Activity

**CGSC 5909 [2.5 credits]****M. Cog. Thesis**

Includes: Experiential Learning Activity

**CGSC 6002 [0.5 credit]****Methodology Rotation I**

Students spend one term in a laboratory or other research venue using a method for studying cognition (behavioural, linguistic-theoretic, computational, conceptual, neuroscientific). Assignments will be as specified by each rotation supervisor.

Includes: Experiential Learning Activity

**CGSC 6003 [0.5 credit]****Methodology Rotation II**

Students spend one term in a laboratory or other research venue using a different method for studying cognition (behavioural, linguistic-theoretic, computational, conceptual, neuroscientific). Assignments will be as specified by each rotation supervisor.

Includes: Experiential Learning Activity

**CGSC 6101 [0.5 credit]****Advanced Statistics for Cognitive Science**

Topics may include data wrangling, data visualization, advanced regression, mixed effects models, and procedures for seeing structure in data (e.g., clustering, multidimensional scaling).

Includes: Experiential Learning Activity

Prerequisite(s): CGSC 5101 or permission of the department.

**CGSC 6501 [0.5 credit]****Special Topics in Cognitive Science**

Seminar course on a topic of interest to students in Cognitive Science. Topics will vary from year to year.

Lectures three hours per week.

**CGSC 6801 [0.5 credit]****Proseminar in Cognitive Science**

A survey of the central problems and issues of natural and artificial cognition and a brief examination of contemporary neuroscience.

Precludes additional credit for CGSC 6800 (no longer offered).

**CGSC 6901 [0.5 credit]****Directed Studies in Cognitive Science I****CGSC 6902 [0.5 credit]****Directed Studies in Cognitive Science II****CGSC 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

# Communication

This section presents the requirements for programs in:

- **M.A. Communication**
- **M.A. Communication with Collaborative Specialization in Climate Change**
- **M.A. Communication with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. Communication with Collaborative Specialization in African Studies**
- **M.A. Communication with Collaborative Specialization in Data Science**
- **Ph.D. Communication**
- **Ph.D. Communication with Collaborative Specialization in Political Economy**

## Program Requirements

### M.A. Communication (5.0 credits)

Each student, in consultation with the supervisor of graduate studies, will be required to follow a thesis, research essay or a coursework program for a total of 5.0 credits. Students in the M.A. program are restricted to one directed studies course, COMS 5808. Students may take one optional course (0.5 credit) outside the program, with permission of the supervisor of graduate studies.

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
COMS 5101 [1.0] Foundations of Communication Studies	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
COMS 5605 [0.5] Approaches to Communication Research	
<b>3. 2.0 credits in:</b>	<b>2.0</b>
COMS 5909 [2.0] M.A. Thesis	
<b>4. 1.5 credits from the list of optional courses below</b>	<b>1.5</b>
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research Essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
COMS 5101 [1.0] Foundations of Communication Studies	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
COMS 5605 [0.5] Approaches to Communication Research	
<b>3. 1.0 credit in:</b>	<b>1.0</b>
COMS 5908 [1.0] Research Essay	
<b>4. 2.5 credits chosen from the list of optional courses</b>	<b>2.5</b>
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
COMS 5101 [1.0] Foundations of Communication Studies	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
COMS 5605 [0.5] Approaches to Communication Research	

<b>3. 3.5 credits chosen from the list of optional courses</b>	<b>3.5</b>
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<b>Total Credits</b>	<b>5.0</b>
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#### Optional Courses

COMS 5200 [0.5]	Civic Media
COMS 5202 [0.5]	Persuasion
COMS 5203 [0.5]	Communication, Technology, Society
COMS 5206 [0.5]	Communication, Culture, Regulation
COMS 5207 [0.5]	Communication and Racialization
COMS 5208 [0.5]	Audiences, Consumption, Reception
COMS 5212 [0.5]	History, Time, Memory
COMS 5214 [0.5]	The Local and the Global
COMS 5218 [0.5]	Special Studies of Media and Communication
COMS 5219 [0.5]	Regional Studies of Media
COMS 5220 [0.5]	Visual Culture
COMS 5221 [0.5]	Science and the Making of Knowledge
COMS 5222 [0.5]	Cultural Intersections
COMS 5223 [0.5]	Work in the Contemporary Media Environment
COMS 5224 [0.5]	Internet, Infrastructure, Materialities
COMS 5225 [0.5]	Critical Data Studies
COMS 5509 [0.5]	Gender, Sexuality, Culture
COMS 5808 [0.5]	Directed Studies

**Note:** students may take up to 0.5 credit outside the program with permission of the supervisor of graduate studies.

### M.A. Communication with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.5 credits in:</b>	<b>1.5</b>
COMS 5101 [1.0] Foundations of Communication Studies	
COMS 5605 [0.5] Approaches to Communication Research	
<b>4. 1.0 credit in:</b>	<b>1.0</b>
COMS 5908 [1.0] Research Essay (in the specialization)	
<b>5. 1.5 credits from the list of optional courses</b>	<b>1.5</b>
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.5 credits in:</b>	<b>1.5</b>
COMS 5101 [1.0] Foundations of Communication Studies	

COMS 5605 [0.5]	Approaches to Communication Research	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
COMS 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>5. 0.5 credit from the list of optional courses</b>		<b>0.5</b>
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Communication with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)**

#### **Requirements - Research essay pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
COMS 5101 [1.0]	Foundations of Communication Studies	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
COMS 5605 [0.5]	Approaches to Communication Research	
<b>5. 1.0 credit in:</b>		<b>1.0</b>
COMS 5908 [1.0]	Research Essay (in the specialization)	
<b>6. 2.0 credits from the list of optional courses</b>		<b>2.0</b>
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Thesis pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
COMS 5101 [1.0]	Foundations of Communication Studies	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
COMS 5605 [0.5]	Approaches to Communication Research	
<b>5. 2.0 credits in:</b>		<b>2.0</b>
COMS 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>6. 1.0 credit from the list of optional courses</b>		<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Communication with Collaborative Specialization in African Studies (5.0 credits)**

#### **Requirements - Research Essay pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>

COMS 5101 [1.0]	Foundations of Communication Studies	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
COMS 5605 [0.5]	Approaches to Communication Research	
<b>5. 1.0 credit in:</b>		<b>1.0</b>
COMS 5908 [1.0]	Research Essay	
<b>6. 2.0 credits chosen from the list of optional courses.</b>		<b>2.0</b>
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Thesis pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
COMS 5101 [1.0]	Foundations of Communication Studies	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
COMS 5605 [0.5]	Approaches to Communication Research	
<b>5. 2.0 credits in:</b>		<b>2.0</b>
COMS 5909 [2.0]	M.A. Thesis	
<b>6. 1.0 credits from the list of optional courses.</b>		<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Communication with Collaborative Specialization in Data Science (5.0 credits)**

#### **Requirements - Coursework pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
COMS 5101 [1.0]	Foundations of Communication Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
COMS 5605 [0.5]	Approaches to Communication Research	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
COMS 5225 [0.5]	Critical Data Studies	
<b>5. 0.5 credit from:</b>		<b>0.5</b>
COMS 5203 [0.5]	Communication, Technology, Society	
COMS 5221 [0.5]	Science and the Making of Knowledge	
COMS 5224 [0.5]	Internet, Infrastructure, Materialities	
<b>6. 2.0 credits in electives</b>		<b>2.0</b>
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research essay pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
COMS 5101 [1.0]	Foundations of Communication Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
COMS 5605 [0.5]	Approaches to Communication Research	

<b>4. 0.5 credit in:</b>	<b>0.5</b>
COMS 5225 [0.5] Critical Data Studies	
<b>5. 1.0 credit in:</b>	<b>1.0</b>
COMS 5908 [1.0] Research Essay	
Research Essay on a Data Science topic approved by the Advisory Board representative from Communication in consultation with the graduate Committee of the Institute of Data Science.	
<b>6. 1.5 credits in electives.</b>	<b>1.5</b>

**Total Credits 5.0**

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5] Introduction to Data Science	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
COMS 5101 [1.0] Foundations of Communication Studies	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
COMS 5605 [0.5] Approaches to Communication Research	

<b>4. 0.5 credit in:</b>	<b>0.5</b>
COMS 5225 [0.5] Critical Data Studies	

<b>5. 2.0 credits in:</b>	<b>2.0</b>
COMS 5909 [2.0] M.A. Thesis	

M.A. Thesis on a Data Science topic approved by the Advisory Board representative from Communication in consultation with the Graduate Committee of the Institute of Data Science.

<b>6. 0.5 credit in electives</b>	<b>0.5</b>
<b>Total Credits</b>	<b>5.0</b>

#### Ph.D. Communication (5.0 credits)

##### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
COMS 6000 [1.0] Doctoral Seminar in Communication Studies	
<b>2. 2.0 credits from the list of electives below; up to 0.5 credit may be taken in a relevant discipline outside of the School; students in the Ph.D. program are restricted to one (0.5 credit) directed studies course:</b>	<b>2.0</b>
COMS 6010 [0.5] Directed Studies	
<b>3. 2.0 credits in:</b>	<b>2.0</b>
COMS 6101 [0.5] Comprehensive Exam: Field I	
COMS 6102 [0.5] Comprehensive Exam: Field II	
COMS 6908 [1.0] Ph.D. Thesis Proposal	
<b>4. 0.0 credits in:</b>	<b>0.0</b>
COMS 6909 [0.0] Ph.D. Thesis (must be successfully defended at an oral examination)	
<b>Total Credits</b>	<b>5.0</b>

#### Ph.D. Communication with Collaborative Specialization in Political Economy (5.0 credits)

##### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
COMS 6000 [1.0] Doctoral Seminar in Communication Studies	

<b>2. 1.0 additional credit from the list of optional courses below: up to 0.5 credit may be taken in a relevant discipline outside of the School; students in the Ph.D. program are restricted to 0.5 credit in directed studies: COMS 6010 Directed Studies</b>	<b>1.0</b>
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<b>3. 2.0 credits in:</b>	<b>2.0</b>
COMS 6101 [0.5] Comprehensive Exam: Field I	
COMS 6102 [0.5] Comprehensive Exam: Field II	
COMS 6908 [1.0] Ph.D. Thesis Proposal	

<b>4. 0.5 credit in:</b>	<b>0.5</b>
PECO 6000 [0.5] Political Economy: Core Concepts	

<b>5. 0.5 credit in:</b>	<b>0.5</b>
A relevant political economy course from the approved list.	

<b>6. 0.0 credits in:</b>	<b>0.0</b>
COMS 6909 [0.0] Ph.D. Thesis (In the Specialization. Must be successfully defended at an oral examination.)	

**Total Credits 5.0**

#### Elective Courses

All doctoral candidates must complete 2.0 additional credits from the list of electives below; 0.5 credit may be taken in a relevant discipline outside of the School, particularly those that address central theoretical and/or methodological issues within the student's chosen field of concentration. Students in the Ph.D. program are restricted to one (0.5 credit) directed studies course (COMS 6010 Directed Studies).

COMS 5200 [0.5]	Civic Media	0.5
COMS 5202 [0.5]	Persuasion	0.5
COMS 5203 [0.5]	Communication, Technology, Society	0.5
COMS 5206 [0.5]	Communication, Culture, Regulation	0.5
COMS 5207 [0.5]	Communication and Racialization	0.5
COMS 5208 [0.5]	Audiences, Consumption, Reception	0.5
COMS 5212 [0.5]	History, Time, Memory	0.5
COMS 5214 [0.5]	The Local and the Global	0.5
COMS 5218 [0.5]	Special Studies of Media and Communication	0.5
COMS 5219 [0.5]	Regional Studies of Media	0.5
COMS 5220 [0.5]	Visual Culture	0.5
COMS 5221 [0.5]	Science and the Making of Knowledge	0.5
COMS 5222 [0.5]	Cultural Intersections	0.5
COMS 5223 [0.5]	Work in the Contemporary Media Environment	0.5
COMS 5224 [0.5]	Internet, Infrastructure, Materialities	0.5
COMS 5225 [0.5]	Critical Data Studies	0.5
COMS 5509 [0.5]	Gender, Sexuality, Culture	0.5
COMS 5605 [0.5]	Approaches to Communication Research	0.5
COMS 6001 [0.5]	Selected Topics in Communication	0.5
COMS 6005 [0.5]	Communication and History	0.5
COMS 6006 [0.5]	Political Economy of Communication	0.5
COMS 6007 [0.5]	Communication, Discourse, and Representation	0.5

COMS 6010 [0.5]	Directed Studies	0.5
JOUR 5401 [0.5]	Journalism Law	0.5

### **Comprehensive Examinations**

In addition to their course requirements, doctoral students are required to pass a comprehensive examination. The comprehensive examination (COMS 6101 and COMS 6102) tests the student's in-depth knowledge of two fields within communication and media studies. Fields to be examined are determined in consultation with their supervisor, with at least one being selected from a list pre-approved by the program. The exam consists of written answers to questions set by the student's supervisor and advisory committee and an oral defence.

Before taking the comprehensive examination, students must have completed all course work and earned a CGPA of 9.0 or higher. The comprehensive exam must be completed no later than six terms after initial full-time registration, or 15 terms after initial part-time registration. Students who do not fulfill this requirement within the prescribed time may be asked to withdraw from the program.

### **Regulations**

See the General Regulations section of this Calendar.

A standing of B- or better must be obtained in each credit counted towards the master's degree.

### **Regulations**

See the General Regulations section of this Calendar.

A standing of B- or better must be obtained in each course counted towards the Ph.D. degree.

### **Admission**

The minimum requirement for admission to the master's program is a B.A.(Honours) degree or the equivalent, with high honours standing in communication or a related discipline. Related disciplines may include sociology, political science, film studies, and Canadian studies.

Applicants without a background in communication studies may be required to take certain designated courses from the undergraduate Communication program in addition to their regular program.

Possession of the minimum entrance standing is not in itself, however, assurance of admission into the program.

Applicants who lack an Honours degree but who have a 3-year degree with honours standing (a minimum B standing overall) may be considered for admission to a qualifying-year program. Students who complete the qualifying year with high honours standing may be considered for admission to the master's program in the following year. Refer to the General Regulations section of this Calendar for regulations governing the qualifying year.

### **Admission**

The normal requirement for admission into the doctoral program is a master's degree (or the equivalent) in communication or a cognate field such as journalism studies, with an overall average of B+ or better.

Applicants who have deficiencies in certain areas may be admitted to the Ph.D. Program, but will normally be required to complete additional course work.

## **Communication and Media Studies (COMS) Courses**

### **COMS 5101 [1.0 credit]**

#### **Foundations of Communication Studies**

Origins and traditions of modern communication studies with attention to theoretical and methodological aspects of developments and debates shaping current communication research.

### **COMS 5102 [0.5 credit]**

#### **Sound Studies**

A critical examination of sound, listening, and audio reproduction technologies across a range of cultural and historical contexts. Topics can include the exploration of distinct listening cultures, audio media, policy, governance, and the politics of sound.

### **COMS 5200 [0.5 credit]**

#### **Civic Media**

The role of communication in relation to the emergence, development, and problematization of citizenship within civil society and the public sphere. Topics to be covered include the communicative strategies of NGOs, the aesthetics of protest, and alternative forms of journalism, among others.

### **COMS 5202 [0.5 credit]**

#### **Persuasion**

Examines various efforts to discover and apply techniques of successful persuasion from classical rhetoric to scientific public opinion research with attention to contemporary political, public information, and corporate campaigns.

### **COMS 5203 [0.5 credit]**

#### **Communication, Technology, Society**

Critically examines the technological context of social communication in terms of human agency, medium theory, and the idea of progress.

### **COMS 5205 [0.5 credit]**

#### **Political Marketing**

Using case studies and simulation exercises, the course will provide students with an understanding of political marketing strategy, market intelligence, consultation and participation, political product development and branding, and marketing practices in government.

Includes: Experiential Learning Activity

Also listed as POLM 5014.

Seminar

**COMS 5206 [0.5 credit]****Communication, Culture, Regulation**

Contemporary and historical modes of regulating and governing media and communication, including policy-making, moral regulation, markets, code and so on. Topics may include the regulation of ownership, content, production, circulation, and consumption.

**COMS 5207 [0.5 credit]****Communication and Racialization**

Provides theoretical and methodological foundations for graduate students studying the constructs of race, ethnicity, and indigeneity in communication and media contexts, particularly from a critical/cultural perspective.

**COMS 5208 [0.5 credit]****Audiences, Consumption, Reception**

How audiences and users consume, interact with, deploy and shape media; how they receive and interpret information; and the impacts of these practices on social relations and institutions. Consumerism, entertainment, and “sites” of consumption, including information technologies, space, and built environments.

**COMS 5209 [0.5 credit]****Climate Change and Communication**

The communication of climate change across a range of issues, which may include science, politics, popular culture, social movements, technology, food systems, Indigenous resurgence and societal transformation. Prerequisite(s): enrolment in MA or PhD Communication program, or Collaborative Specialization in Climate Change, or permission of the School of Journalism and Communication.

**COMS 5212 [0.5 credit]****History, Time, Memory**

Interactions among notions of time, environments, media technologies and artifacts, and the production of memory and history. Topics may include practices of memorialization through historical monuments or museums, contemporary challenges of data storage and media archiving, issues of technological obsolescence and waste, and more.

**COMS 5214 [0.5 credit]****The Local and the Global**

Communicative aspects of globalization in the context of the local. Among the areas to be addressed include global communication history, cultural imperialism, international regulation, transnational networking, cultural industries, media integration, diasporic communication, and the translocal circulation of content.

**COMS 5218 [0.5 credit]****Special Studies of Media and Communication**

Examines a specific traditional or non-traditional medium or practice of communication. Topics will vary from year to year.

**COMS 5219 [0.5 credit]****Regional Studies of Media**

An exploration of the media landscape of specific region or geographical/political territory. Attention will be given to understanding specific conditions of reception, the character of media industries, and the historical development of media forms. Topics will vary from year to year.

**COMS 5220 [0.5 credit]****Visual Culture**

The role of image in (re)producing culture. Diverse practices of visual communication such as photography, built environments, screen culture, and image sharing through virtual social networks.

**COMS 5221 [0.5 credit]****Science and the Making of Knowledge**

Issues related to science and communication. Topics may include: contemporary issues such as public health risks, climate change, science as ideology, the relationship between science and politics; historical considerations of the relationship between knowledge and expertise.

**COMS 5222 [0.5 credit]****Cultural Intersections**

Critically examines the engagement of cultures with each other in contexts such as the constructions of self and other, settler-colonial relations, postcolonial discourses, multiculturalism, cosmopolitanism, communication between groups and across borders, and the roles of media in cultural intersections .

**COMS 5223 [0.5 credit]****Work in the Contemporary Media Environment**

Modes of media work and labour. Topics may include studies of immaterial labour, emotional labour, user-generated content and active audiences, labour and labour relations in digitizing media industries.

**COMS 5224 [0.5 credit]****Internet, Infrastructure, Materialities**

The internet as infrastructure; how the technical characteristics of the internet influence our experience and use of this medium. Questions addressing the physical structures, power and control, and ecological impacts of the internet are also considered.

**COMS 5225 [0.5 credit]****Critical Data Studies**

Theoretical debates, research approaches and discursive regimes pertaining to the datafication of everyday life, data and living environments, and the quantified control of the future. Emphasis on the production of databased knowledge and the influence data have on the material and social world.

**COMS 5509 [0.5 credit]****Gender, Sexuality, Culture**

Theoretical debates and current research in the production and reproduction of gender, sexual and sexualized relations through communication processes, practices and institutions.

**COMS 5605 [0.5 credit]****Approaches to Communication Research**

Processes of conducting communication research in the context of writing a thesis or research essay. Topic selection, question framing, research design, the use of theory; specific methodologies such as content analysis, discourse analysis, survey research, ethnography, semiotics, and historical analysis.

Includes: Experiential Learning Activity

**COMS 5808 [0.5 credit]****Directed Studies**

Directed research or readings on a topic area not covered in that year's course offerings.

**COMS 5908 [1.0 credit]****Research Essay**

Includes: Experiential Learning Activity

**COMS 5909 [2.0 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

**COMS 6000 [1.0 credit]****Doctoral Seminar in Communication Studies**

A seminar encompassing the program's three fields of concentration: the history of communication as object and field of study, the political economy of communication, and socio-cultural analysis of communication. Includes substantive summative assessment.

**COMS 6001 [0.5 credit]****Selected Topics in Communication**

Examines a newly emerging issue, research method, or theory related to communication. Topic will vary from year to year.

**COMS 6005 [0.5 credit]****Communication and History**

The history of communication and its conceptualization from various perspectives as well as the way in which historical events arise through communication.

**COMS 6006 [0.5 credit]****Political Economy of Communication**

The history of political economy with attention to applications in the field of communication.

**COMS 6007 [0.5 credit]****Communication, Discourse, and Representation**

The processes and practices of representation through which meanings arise.

Precludes additional credit for COMM 6007 (no longer offered).

**COMS 6010 [0.5 credit]****Directed Studies**

Directed research or readings on a topic area not covered in that year's course offerings.

**COMS 6101 [0.5 credit]****Comprehensive Exam: Field I**

Demonstration of in-depth knowledge of an area of inquiry related to communication and media studies. Examination conducted by supervisory committee on basis of written answers and an oral defence. Graded as Satisfactory or Unsatisfactory.

Precludes additional credit for COMS 6900, COMS 6901.

**COMS 6102 [0.5 credit]****Comprehensive Exam: Field II**

Demonstration of in-depth knowledge of an area of inquiry related to communication and media studies. Examination conducted by supervisory committee on basis of written answers and an oral defence. Graded as Satisfactory or Unsatisfactory.

Precludes additional credit for COMS 6900, COMS 6901.

**COMS 6900 [1.0 credit]****Comprehensive Examination I**

Examination normally conducted in May of each year in connection with COMS 6000 and covering the program's three fields of concentration: history of communication as object and field of study; political economy of communication; socio-cultural analysis of communication. Graded as Satisfactory or Unsatisfactory.

**COMS 6901 [1.0 credit]**  
**Comprehensive Examination II**

Examination by the student's thesis supervisor and committee of an approved project related to a particular field of communication research; the field may or may not be related to the student's thesis. Graded as Satisfactory or Unsatisfactory.

**COMS 6908 [1.0 credit]**  
**Ph.D. Thesis Proposal**

The production and oral defence of a written proposal for the student's thesis research.

Prerequisite(s): COMS 6101, COMS 6102.

**COMS 6909 [0.0 credit]**  
**Ph.D. Thesis**

Includes: Experiential Learning Activity

## Computer Science

This section presents the requirements for programs in:

- **M.C.S. Computer Science**
- **M.C.S. Computer Science with Collaborative Specialization in Cybersecurity**
- **M.C.S. Computer Science with Collaborative Specialization in Data Science**
- **Ph.D. Computer Science**

### Program Requirements

#### M.C.S. Computer Science (5.0 credits)

##### Requirements - Thesis pathway (5.0 credits)

1. 2.5 credits in course work. Course work must include a minimum of 1.5 credits of OCICS courses in three different research areas (see OCICS course listing by research areas).	2.5
2. 2.5 credits in:	2.5
COMP 5905 [2.5]	M.C.S. Thesis (Each candidate submitting a thesis will be required to undertake an oral defence of the thesis.)

**Total Credits** 5.0

##### Requirements - Non-Thesis pathway (5.0 credits)

1. 4.0 credits in course work. Course work must include a minimum of 1.5 credits of OCICS courses in three different research areas (see OCICS course listing by research areas).	4.0
2. 1.0 credits in Graduate project OR additional OCICS courses	1.0
COMP 5903 [1.0]	Graduate Project (M.C.S.)
OR	
1.0 credits of additional OCICS courses	

**Total Credits** 5.0

#### M.C.S. Computer Science with Collaborative Specialization in Cybersecurity (5.0 credits)

##### Requirements - Thesis pathway (5.0 credits)

1. 1.0 credit in:	1.0
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
2. 1.5 credits in course work. Course work must include a minimum of 1.5 credits of OCICS courses in three different research areas (see OCICS course listing by research areas).	1.5
3. 2.5 credits in graduate thesis (Each candidate submitting a thesis will be required to undertake an oral defence of the thesis).	2.5
COMP 5905 [2.5]	M.C.S. Thesis (in the area of the specialization)

**Total Credits** 5.0

##### Requirements - Non-Thesis pathway (5.0 credits)

1. 1.0 credit in:	1.0
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity

<b>2. 3.0 credits in</b> course work. Course work must include a minimum of 1.5 credits of OCICS courses in three different research areas (see OCICS course listing by research areas).	3.0
<b>3. 1.0 credit in</b> Graduate project OR additional OCICS courses.	1.0
COMP 5903 [1.0] Graduate Project (M.C.S.) (in the area of the specialization)	
OR	
1.0 credits of additional OCICS courses	
<b>Total Credits</b>	<b>5.0</b>

### **M.C.S. Computer Science with Collaborative Specialization in Data Science (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5] Introduction to Data Science	
<b>2. 2.0 credits in</b> course work. Course work must include a minimum of 1.5 credits of OCICS courses in at least three different research areas. See OCICS course listing by research areas.	2.0
<b>3. 2.5 credits in:</b>	2.5
COMP 5905 [2.5] M.C.S. Thesis (M.C.S. Thesis must be in an area of Data Science and requires approval from the Institute of Data Science. Each candidate submitting a thesis will be required to undertake an oral defence of the thesis.)	
<b>Total Credits</b>	<b>5.0</b>

### **Ph.D. Computer Science (1.5 credits)**

#### **Requirements:**

<b>1. 1.5 credits in</b> OCICS courses within the first 4 terms.	1.5
The admission committee and the student's advisory committee may impose additional program requirements according to the student's background and research topic.	
<b>2. Requirement of two seminars.</b>	
<b>3. 0.0 credit in:</b>	0.0
COMP 6907 [0.0] Doctoral Comprehensive (involving breadth and depth components, must be taken within the first 4 terms)	
<b>4. 0.0 credit in:</b>	0.0
COMP 6908 [0.0] Doctoral Proposal (defended at an oral examination within the first 6 terms)	
<b>5. 0.0 credits in:</b>	
COMP 6909 [0.0] Ph.D. Thesis (defended at an oral examination)	
<b>Total Credits</b>	<b>1.5</b>

#### **OCICS Graduate Courses**

The Ottawa-Carleton Institute for Computer Science (OCICS) is a joint program consisting of the School of Electrical Engineering and Computer Science (EECS) at the University of Ottawa and the School of Computer Science (SCS) at Carleton University.

MCS students must complete a minimum of 1.5 credits of OCICS courses across at least three different research areas:

Software Engineering (E)  
Theory of Computing (T)  
Computer Applications (A)  
Computer Systems (S)

Please note that courses with COMP (CSI) designation are offered by SCS, while courses with CSI (COMP) designation are offered by EECS.

For a list of courses in the various research areas, please refer to the OCICS List of Courses page. Please note that not all courses on the OCICS List of Courses page are offered in a given year. Please consult the Public Class Schedule for up-to-date course offerings for each academic term and refer to the OCICS Course Timetable for specific area requirements.

### **Admission**

#### **M.C.S.**

#### **M.C.S. with Collaborative Specialization in Data Science**

#### **M.C.S with Collaborative Specialization in Cybersecurity**

See the General Regulations section of this Calendar for detailed admission requirements. Applicants should have an honours bachelor's degree in computer science or the equivalent. By equivalent is meant an honours degree in a program that includes at least twelve computer science half-credits, two of which must be at the 4000-level, and eight half-credits in mathematics, one of which must be at the 3000- or 4000-level.

Applicants who have a three-year non-honours bachelor's degree, or who otherwise lack the required undergraduate preparation, may be admitted to a qualifying-year program. Refer to the General Regulations section of this Calendar for regulations governing the qualifying year.

#### **Accelerated Pathway**

The accelerated pathway in the M.C.S. Computer Science is a flexible and individualized plan of graduate study. Students in their third year of the Carleton B.C.S. Hons. degree with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third-year of study in the B.C.S. Hons. degree should consult with both an SCS Undergraduate Advisor and the Graduate Director to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

If admitted to the M.C.S Accelerated Pathway, students can take up 1.0 credit in 5000-level COMP. If the student wishes to apply for the M.C.S program, the COMP 5000-level courses taken as part of the B.C.S may receive advanced standing of up to 1.0 credit which can reduce their time to completion in the M.C.S program.

#### **Requirement for Eligibility to the Accelerated Pathway**

1. Minimum Major CGPA of A-.

### **Requirements for Admission to the MCS after completing the Accelerated Pathway**

1. 0.5 credit in COMP at the 5000-level with a grade of B+ or higher.
2. Minimum overall and Major CGPA of A-.

### **Admission**

See the General Regulations section of this Calendar for detailed admission requirements. Admission to the Ph.D. in Computer Science requires a Masters in Computer Science with thesis, or equivalent including demonstrated significant research ability.

In exceptional cases, students who are currently in the M.C.S. program and who have completed all course requirements with a grade of no less than A in each course may be permitted to transfer into the Ph.D. program.

### **Co-operative Education**

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

### **Application Requirements**

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

### **Participation Requirements**

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.
- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

### **Co-op Participation Agreement**

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

### **Communication with the Co-op Office**

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

### **Graduation with the Co-op Designation**

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

### **Employment**

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

### **Work Term Assessment and Evaluation**

#### **Work Term Evaluation**

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

#### **Work Term Assessment**

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

#### **Voluntary Withdrawal from the Co-op Option**

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

#### **Involuntary or Required Withdrawal from the Co-op Option**

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;

6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### International Students

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

### Co-op Fees

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

### Computer Science Co-operative Education Option

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the Master of Computer Science;
2. have achieved, by the end of their first term of academic study, a minimum grade of A- in at least two 5000-level COMP courses;
3. have achieved, by the start-date of the first work term, a minimum grade of A- in at least four 5000-level COMP courses;
4. be registered as a full-time student in each academic term prior to a work term;
5. be eligible to work in Canada (for off-campus work terms)

For more information, please refer to the Co-operative Education Policy.

### Regulations

See the General Regulations section of this Calendar.

### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the Master of Computer Science program, including all specializations/concentrations within the program, is considered a regularly scheduled break approved by Carleton University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### Computer Science (COMP) Courses

#### Note:

- Course credit preclusions: certain Computer Science courses listed below may have been available as an

undergraduate section. Students who have completed an undergraduate course at Carleton University with the same instructor and a similar title are not eligible to take the graduate section for credit. Please consult the department with questions.

### COMP 5001 [0.5 credit] (CSI 5113)

#### Foundations of Programming Languages

Advanced study of programming paradigms from a practical perspective. Paradigms may include functional, imperative, concurrent, distributed, generative, aspect- and object-oriented, and logic programming. Emphasis on underlying principles. Topics may include: types, modules, inheritance, semantics, continuations, abstraction and reflection.

### COMP 5002 [0.5 credit] (CSI 5128)

#### Swarm Intelligence

Collective computation, collective action, and principles of self-organization in social agent systems. Algorithms for combinatorial optimization problems, division of labour, task allocation, task switching, and task sequencing with applications in security, routing, wireless and ad hoc networks and distributed manufacturing.

### COMP 5003 [0.5 credit] (CSI 5308)

#### Principles of Distributed Computing

Formal models of distributed environment; theoretical issues in the design of distributed algorithms; message and time complexity; problem solving in distributed settings. Problems discussed may include: coordination and control, information diffusion, leader election, consensus, distributed data operations, computing by mobile entities.

### COMP 5004 [0.5 credit] (CSI 5134)

#### Fault Tolerance

Hardware and software techniques for fault tolerance. Topics include modeling and evaluation techniques, error detecting and correcting codes, module and system level fault detection mechanisms, design techniques for fault-tolerant and fail-safe systems, software fault tolerance through recovery blocks, N-version programming, algorithm-based fault tolerance, checkpointing.

### COMP 5005 [0.5 credit] (CSI 5390)

#### Learning Systems for Random Environments

Computerized adaptive learning for random environments and its applications. Topics include a mathematical review, learning automata which are deterministic/stochastic, with fixed/variable structures, of continuous/discretized design, with ergodic/absorbing properties and of estimator families.

**COMP 5007 [0.5 credit] (CSI 5149)****Graphical Models and Applications**

Bayesian networks, factor graphs, Markov random fields, maximum a posteriori probability (MAP) and maximum likelihood (ML) principles, elimination algorithm, sum-product algorithm, decomposable and non-decomposable models, junction tree algorithm, completely observed models, iterative proportional fitting algorithm, expectation-maximization (EM) algorithm, iterative conditional modes algorithm.

**COMP 5008 [0.5 credit] (CSI 5164)****Computational Geometry**

Study of design and analysis of algorithms to solve geometric problems; emphasis on applications such as robotics, graphics, and pattern recognition. Topics include: visibility problems, hidden line and surface removal, path planning amidst obstacles, convex hulls, polygon triangulation, point location.

**COMP 5100 [0.5 credit] (CSI 5180)****Topics in Artificial Intelligence**

Areas in knowledge-based systems including recent approaches to machine learning and data mining, inference methods, knowledge-based and fuzzy systems, heuristic search, and natural language processing. Precludes additional credit for COMP 4106 (no longer offered).

**COMP 5101 [0.5 credit] (CSI 5311)****Distributed Databases and Transaction Processing Systems**

Principles in the design and implementation of distributed databases and distributed transaction processing systems. Topics include: distributed computing concepts, computing networks, distributed and multi-database system architectures and models, atomicity, synchronization and distributed concurrency control algorithms, data replication, recovery techniques, reliability in distributed databases.

**COMP 5102 [0.5 credit] (CSI 5312)****Distributed Operating Systems**

An advanced course on the software infrastructure supporting large-scale cloud computing applications. Topics may include: distributed file systems, distributed databases, overlay networks, container orchestration, coordination services, security and privacy services, and large-scale AI pipelines.

Also offered at the undergraduate level, with different requirements, as COMP 4000, for which additional credit is precluded.

**COMP 5103 [0.5 credit] (CSI 5148)****Wireless Ad Hoc Networking**

Self-organized, mobile, and hybrid ad hoc networks. Physical, medium access, networks, transport and application layers, and cross-layering issues. Power management. Security in ad hoc networks. Topology control and maintenance. Data communication protocols, routing and broadcasting. Location service for efficient routing.

**COMP 5104 [0.5 credit] (CSI 5314)****Object-Oriented Software Development**

Issues in modeling and verifying quality and variability in object-oriented systems. Testable models in model-driven and test-driven approaches. System family engineering. Functional conformance: scenario modeling and verification, design by contract. Conformance to non functional requirements: goals, forces and tradeoffs, metrics.

**COMP 5107 [0.5 credit] (CSI 5185)****Statistical and Syntactic Pattern Recognition**

Topics include a mathematical review, Bayes decision theory, maximum likelihood and Bayesian learning for parametric pattern recognition, non-parametric methods including nearest neighbor and linear discriminants. Syntactic recognition of strings, substrings, subsequences and tree structures. Applications include speech, shape and character recognition.

**COMP 5108 [0.5 credit] (CSI 5126)****Algorithms in Bioinformatics**

Fundamental mathematical and algorithmic concepts underlying computational molecular biology; physical and genetic mapping, sequence analysis (including alignment and probabilistic models), genomic rearrangement, phylogenetic inference, computational proteomics and systemics modelling of the whole cell.

**COMP 5110 [0.5 credit] (CSI 5136)****Computer Security and Usability**

This course focuses on designing and evaluating security and privacy software with particular attention to human factors and how interaction design impacts security. Topics include current approaches to usable security, methodologies for empirical analysis, and design principles for usable security and privacy.

**COMP 5111 [0.5 credit] (CSI 5153)****Data Management for Business Intelligence**

Application of computational techniques to support business such as decision making, business understanding, data analysis, business process automation, learning from data, producing and using business models, data integration, data quality assessment and cleaning, use of contextual data, etc. Also offered at the undergraduate level, with different requirements, as COMP 4111, for which additional credit is precluded.

**COMP 5112 [0.5 credit] (CSI 5154)****Algorithms for Data Science**

Algorithmic techniques to handle (massive/big) data arising from, for example, social media, mobile devices, sensors financial transactions. Algorithmic techniques may include locality-sensitive hashing, dimensionality reduction, streaming, clustering, VC-dimensions, external memory, core sets, link analysis and recommendation systems.

**COMP 5113 [0.5 credit] (CSI 5350)****Machine Learning for Healthcare**

Principles, techniques, technology and applications of machine learning for medical data such as medical imaging data, genomic data, physiological signals, speech and language.

**COMP 5114 [0.5 credit] (CSI 5351)****Quantum Communications and Networking**

Quantum communications and networking; the use of individual photons and teleportation to represent and transmit information. Theoretical (mathematical) principles. Practical aspects (implementation and software simulation) of quantum communications and networking.

**COMP 5115 [0.5 credit] (CSI 5344)****Geometry Processing**

Concepts, representations, and algorithms for processing 3D geometric datasets. Topics include shape representations (e.g., triangle meshes and implicit functions), and the geometry processing pipeline covering the acquisition (e.g., with laser scanning or depth cameras), reconstruction, manipulation, editing, analysis, and fabrication (3D printing) of geometric models.

**COMP 5116 [0.5 credit] (CSI 5155)****Machine Learning**

Broad introduction to the fundamental concepts, techniques and algorithms in machine learning. Many of these concepts use probability, statistics, linear algebra and calculus; since some of the algorithms are implemented, programming skills at a level sufficient to write a reasonable non-trivial computer program are desirable.

**COMP 5117 [0.5 credit] (CSI 5346)****Mining Software Repositories**

Introduction to the methods and techniques of mining software engineering data. Software repositories and their associated data. Data extraction and mining. Data analysis and interpretation (statistics, metrics, machine learning). Empirical case studies.

**COMP 5118 [0.5 credit] (CSI 5347)****Trends in Big Data Management**

In-depth study of recent research articles in the field of data management, with focus on data integration, Internet of Things, large scale data management, recommendation systems, text processing, and question answering. Students will work on a term-long project.

**COMP 5119 [0.5 credit] (CSI 5345)****Internet of Things Security**

Security issues related to the Internet of Things (IoT). IoT device software design and device lifecycle, device pairing and configuration, management and security infrastructure, smart home platforms, data and communication protocol security, IoT operating systems, malware, firmware in embedded systems, security administration and best practices.

**COMP 5120 [0.5 credit] (CSI 5106)****Cryptography**

Security in encryption algorithms. Encryption and decryption. Entropy, equivocation, and unicity distance. Cryptanalysis and computational complexity. Substitution, transposition, and product ciphers. Symmetric ciphers: block and stream modes. Modular arithmetic. Public key cryptosystems. Factorization methods. Elliptic curve, lattice-based, and homomorphic cryptography. Proofs of security.

**COMP 5137 [0.5 credit] (CSI 5187)****Applications of NLP and ML in Software Engineering**

Qualitative Coding of Software Engineering Artifacts, Case Study Research, Natural Language Processing Pipelines and Lexicons, Text Similarity Measures, Information Extraction and Classification, Clustering, Supervised Machine Learning, Quantitative Evaluation of NLP and ML Techniques, Deep Learning, Word Embeddings, Transformers.

**COMP 5138 [0.5 credit] (CSI 5186)****AI-enabled Software Verification and Testing**

Automated decision procedures, SAT/SMT solvers; symbolic execution, random and local search algorithms; evolutionary and genetic programming; multi-objective and bio-inspired optimization, search-based software engineering; machine learning for software engineering; and software testing case studies for cyber-physical, deep learning, autonomous driving, and network systems.

**COMP 5139 [0.5 credit]****Advanced Machine Learning**

Advanced topics in machine learning such as deep learning including CNNs, RNNs, GANs, Diffusion models, Transformers, Deep clustering, transfer learning, domain adaptation, few-shot learning, zero-shot learning, self-supervised learning and Interpretability of ML methods.

**COMP 5201 [0.5 credit] (CSI 5147)****Computer Animation**

Theories and techniques in 3D modeling and animation. Animation principles, categories, and history. Forward and inverse kinematics. Motion capture, editing and retargeting. Flexible bodies. Particle animation. Behavioral animation. Human modeling. Facial animation. Cloth animation and other sub-topics.

**COMP 5202 [0.5 credit] (CSI 5146)****Computer Graphics**

Principles and advanced techniques in rendering and modelling. Research field overview. Splines, subdivision surfaces and hierarchical surface representations. Physics of light transport, rendering equation and Bidirectional Reflectance Distribution Function. Classical ray tracing, radiosity, global illumination and modern hybrid methods. Plenoptic function and image-based rendering.

**COMP 5203 [0.5 credit] (CSI 5173)****Data Networks**

Mathematical and practical aspects of design and analysis of communication networks. Topics include: basic concepts, layering, delay models, multi-access communication, queuing theory, routing, fault-tolerance, and advanced topics on high-speed networks, ATM, mobile wireless networks, and optical networks.

**COMP 5204 [0.5 credit] (CSI 5124)****Computational Aspects of Geographic Information Systems**

Through recent advances in navigation systems, mobile devices, and new software such as Mapquest and Google Earth, GIS is becoming increasingly important and exciting from a CS perspective. This course lays the algorithmic foundations to understand, use and further this technology.

Also offered at the undergraduate level, with different requirements, as COMP 4202, for which additional credit is precluded.

**COMP 5205 [0.5 credit] (CSI 5151)****Virtual Environments**

Basic concepts. Virtual worlds. Hardware and software support. World modeling. Geometric modeling. Light modeling. Kinematic and dynamic models. Other physical modeling modalities. Multi-sensor data fusion. Anthropomorphic avatars. Animation: modeling languages, scripts, real-time computer architectures. Virtual environment interfaces. Case studies.

**COMP 5206 [0.5 credit] (CSI 5183)****Evolutionary Computation and Artificial Life**

Study of algorithms based upon biological theories of evolution, applications to machine learning and optimization problems. Possible topics: Genetic Algorithms, Classifier Systems, and Genetic Programming. Recent work in the fields of Artificial Life (swarm intelligence, distributed agents, behavior-based AI) and of connectionism.

Precludes additional credit for COMP 4107.

**COMP 5207 [0.5 credit] (CSI 5112)****Software Engineering**

Topics of current interest in Software Engineering, such as requirements engineering, precise and advanced modelling, development processes, change management, standards, and emerging types of applications.

**COMP 5209 [0.5 credit] (CSI 5135)****Visual Analytics**

Principles, techniques, technology and applications of information visualization for data analysis. Topics include human visual perception, cognitive processes, static and dynamic models of image semantics, interaction paradigms, big data visual analysis case studies. Includes: Experiential Learning Activity

**COMP 5210 [0.5 credit] (CSI 5167)****Human-Computer Interaction Models, Theories, and Frameworks**

Emphasis on the application of theory to user interface design. Review of main theories of human behaviour relevant to HCI, including especially cognitive dimensions of notations framework, mental models, distributed cognition, and activity theory, and their application to design and development of interactive systems.

Lecture

**COMP 5220 [0.5 credit] (CSI 5175)****Mobile Commerce Technologies**

Wireless networks support for m-commerce; m-commerce architectures and applications; mobile payment support systems; business models; mobile devices and their operating systems; mobile content presentation; security issues and solutions; relevant cross layer standards and protocols; case studies.

Includes: Experiential Learning Activity

**COMP 5301 [0.5 credit] (CSI 5122)****Software Usability**

Design principles and metrics for usability. Qualitative and quantitative methods for evaluation of software system usability: Heuristic evaluation, usability testing, usability inspections and walkthroughs, cognitive walkthroughs, formal usability experimentation. Ethical concerns.

Economics of usability. Integration of usability engineering lifestyle.

**COMP 5302 [0.5 credit] (CSI 5118)****Automated Verification & Validation of Software**

Topics in formal test derivation methods, test management, high-level, CASE-based verification and validation, data-flow and control-flow measures and metrics for assessing quality of designs and code, regression analysis and testing.

**COMP 5304 [0.5 credit] (CSI 5169)****Wireless Networks and Mobile Computing**

Computational aspects and applications of design and analysis of mobile and wireless networking. Topics include Physical, Link Layer, Media Access Control, Wireless, Mobile LANs, Ad-Hoc, Sensor Networks, Power Consumption optimization, Routing, Searching, Service Discovery, Clustering, Multicasting, Localization, Mobile IP/TCP, File Systems, Mobility Models, Wireless Apps.

**COMP 5305 [0.5 credit] (CSI 5129)****Advanced Database Systems**

In-depth study on developments in database systems shaping the future of information systems, including complex object, object-oriented, object-relational, and semi-structured databases. Data structures, query languages, implementation and applications.

**COMP 5306 [0.5 credit] (CSI 5100)****Data Integration**

Materialized and virtual approaches to integration of heterogeneous and independent data sources. Emphasis on data models, architectures, logic-based techniques for query processing, metadata and consistency management, the role of XML and ontologies in data integration; connections to schema mapping, data exchange, and P2P systems.

**COMP 5307 [0.5 credit] (CSI 5101)****Knowledge Representation**

KR is concerned with representing knowledge and using it in computers. Emphasis on logic-based languages for KR, and automated reasoning techniques and systems; important applications of this traditional area of AI to ontologies and semantic web.

**COMP 5308 [0.5 credit] (CSI 5102)****Topics in Medical Computing**

Introductory course on data structures, algorithms, techniques, and software development related to medical computing (in particular spatial modeling). Topics may include: computational geometry algorithms for cancer treatment, medical imaging, spatial data compression algorithms, dynamic programming for DNA analysis.

**COMP 5309 [0.5 credit] (CSI 5168)****Digital Watermarking**

Overview of recent advances in watermarking of image, video, audio, and other media. Spatial, spectral, and temporal watermarking algorithms. Perceptual models. Use of cryptography in steganography and watermarking. Content authentication, copy control, intellectual property, digital rights management and other applications.

**COMP 5310 [0.5 credit] (CSI 5152)****Evolving Information Networks**

Convergence of social and technological networks with WWW. Interplay between information content, entities creating it and technologies supporting it. Structure and analysis of such networks, models abstracting their properties, link analysis, search, mechanism design, power laws, cascading, clustering and connections with work in social sciences.

Also offered at the undergraduate level, with different requirements, as COMP 4206, for which additional credit is precluded.

**COMP 5340 [0.5 credit] (CSI 5340)****Introduction to Deep Learning and Reinforcement Learning**

Fundamentals of machine learning; multi-layer perceptron, universal approximation theorem, back-propagation; convolutional networks, recurrent neural networks, variational auto-encoder, generative adversarial networks; components and techniques in deep learning; Markov Decision Process; Bellman equation, policy iteration, value iteration, Monte-Carlo learning, temporal difference methods, Q learning, SARSA, applications.

**COMP 5341 [0.5 credit] (CSI 5341)****Learning-based Computer Vision**

Introduction to learning-based computer vision; statistical learning background; image processing and filtering primer; convolutional neural networks (CNNs), network layers, computer vision data sets and competitions; computer vision problems, in particular, image classification, detection and recognition, semantic segmentation, image generation, multi view problems and tracking.

**COMP 5342 [0.5 credit] (CSI 5342)****Ubiquitous Sensing for Smart Cities**

Sensor and actuator networks. Dedicated and non-dedicated sensing. Vehicular sensing and smart transportation. Software Defined Things. Sensing as a service. Machine and deep learning-based misbehaviour detection. IoT-data analytics ecosystems. Federated Learning. AI-based security solutions. Auction and game theory concepts in ubiquitous sensing.

**COMP 5343 [0.5 credit] (CSI 5343)****AI-Enabled Communications**

Wireless networking fundamentals. Device to-device communications. Networking with cognitive radio. Cyber physical systems (CPS). Self-organization. Supervised and unsupervised learning. Reinforcement learning. Deep learning.

**COMP 5401 [0.5 credit] (CSI 5389)****Electronic Commerce Technologies**

Introduction to business models and technologies. Search engines. Cryptography. Web services and agents. Secure electronic transactions. Value added e-commerce technologies. Advanced research questions.

**COMP 5402 [0.5 credit] (CSI 5142)****Protocols for Mobile and Wireless Networks**

Link and network layer protocols of wireless networks; applications of wireless networks may be discussed. Topics may include: protocol implementation, mobile IP, resource discovery, wireless LANs/PANs, and Spread spectrum.

Precludes additional credit for SYSC 5306.

**COMP 5405 [0.5 credit] (CSI 5380)****Systems and Architectures for Electronic Commerce**

E-commerce system architecture with a focus design patterns. Web servers and application frameworks. Web protocols, services, and client technologies. Scalability through load balancing, clustering, and code optimization. Internationalization, accessibility, and privacy. Data mining and sharing approaches for digital targeted advertising. E-commerce development project.

**COMP 5406 [0.5 credit] (CSI 5105)****Network Security and Cryptography**

Advanced methodologies selected from symmetric and public key cryptography, network security protocols and infrastructure, identification, anonymity, privacy technologies, secret-sharing, intrusion detection, firewalls, access control technologies, and defending network attacks.

**COMP 5407 [0.5 credit] (CSI 5116)****Authentication and Software Security**

Specialized topics in security including advanced authentication techniques, user interface aspects, electronic and digital signatures, security infrastructures and protocols, software vulnerabilities affecting security, untrusted software and hosts, protecting software and digital content.

**COMP 5408 [0.5 credit] (CSI 5121)****Advanced Data Structures**

Simple methods of data structure design and analysis that lead to efficient data structures for several problems. Topics include randomized binary search trees, persistence, fractional cascading, self-adjusting data structures, van Emde Boas trees, tries, randomized heaps, and lowest common ancestor queries.

**COMP 5409 [0.5 credit] (CSI 5127)****Applied Computational Geometry**

Computer-based representation and manipulation of geometric objects. Design and analysis of efficient algorithms for solving geometric problems in applied fields such as Computer-Aided Design and Manufacturing, Cartography, Materials Science, and Geometric Network Design.

**COMP 5500 [0.5 credit] (CSI 5352)****Internet Measurements and Security**

Measurement methodologies for understanding complex Internet phenomena and behaviors including: spread of vulnerabilities, remote network topologies, attack patterns, content popularity, Internet censorship, service quality, and adoption of security systems. Tools for efficient measurements, large-scale data analysis, stats, reproducibility of results. Ethical considerations.

**COMP 5501 [0.5 credit] (CSI 5111)****Software Quality Engineering**

Software quality issues. Quality components and metrics. Software process quality. Software reliability engineering. Software design for testability. Requirements capture and validation. Systematic design validation; grey-box approach, test design, implementation and management, case studies in validation and verification of communications software. Object-oriented design and test.

**COMP 5503 [0.5 credit] (CSI 5115)****Database Analysis & Design**

The dimensional and multidimensional data models for data warehousing. Data dependencies and decomposition. Structure and use of data definition and manipulation languages. Database economics, engineering, deployment and evolution. Issues in integrity, security, the Internet and distributed databases. Relationships to decision support systems.

**COMP 5505 [0.5 credit] (CSI 5386)****Natural Language Processing**

Overview of both rule-based or symbolic methods and statistical methods as approaches to Natural Language Processing (NLP), with more emphasis on the statistical ones. Applications such as information retrieval, text categorization, clustering, and statistical machine translation could be discussed.

**COMP 5604 [0.5 credit] (CSI 5174)****Validation Methods for Distributed Systems**

Review of formal specification and description techniques for distributed and open systems. Verification techniques. Correctness proofs. Verification of general properties of distributed systems. Analysis and relief strategies. Testing techniques. Test generation strategies. Test architectures.

**COMP 5606 [0.5 credit] (CSI 5161)****Principles of Distributed Simulation**

Distributed simulation principles and practices. Synchronization protocols: Optimistic vs Conservative, Deadlock detection in conservative simulations, Time warp simulation. Distributed interactive simulation: Data distribution management, Interest management, High Level Architectures (HLA), Run Time Infrastructure (RTI). Distributed web-based and agent based simulation. Real time applications.

**COMP 5700 [0.5 credit] (CSI 5108)****Introduction to Convex Optimization**

Linear, nonlinear and convex problems. Convex affine sets. Convex, quasiconvex and log-convex functions. Operations preserving convexity. Recognizing and formulating convex optimization problems. The Lagrange function, optimality conditions, duality, geometric and saddle-point interpretations. Least-norm, regularized and robust approximations. Statistical estimation, detector design. Adaptive antennas.

**COMP 5701 [0.5 credit] (CSI 5107)****Principle of Intelligent Transportation Systems**

Fundamental concepts of ITS. Computer information and communication for ITS. The backbone of ITS communication, network topologies and configurations. ITS models and evaluation Methods. Advanced transportation management, advanced traveler information and advanced driver assistant systems. Smart mobility and GPS localization algorithms.

**COMP 5703 [0.5 credit] (CSI 5163)****Algorithm Analysis and Design**

Topics of current interest in the analysis and design of sequential and parallel algorithms for non-numerical, algebraic and graph computations. Lower bounds on efficiency of algorithms. Complexity classes.

**COMP 5704 [0.5 credit] (CSI 5131)****Parallel Algorithms and Applications in Data Science**

Multiprocessor architectures from an application programmer's perspective: programming models, processor clusters, multi-core processors, GPU's, algorithmic paradigms, efficient parallel problem solving, scalability and portability. Projects on high performance computing in Data Science, incl. data analytics, bioinformatics, simulations. Programming experience on parallel processing equipment. Includes: Experiential Learning Activity

**COMP 5706 [0.5 credit] (CSI 5387)****Data Mining & Concept Learning**

Concepts and techniques of data mining. Methods for data summarization and data preprocessing. Algorithms for finding frequent patterns and association analysis; classification; cluster analysis and anomaly detection. Model selection, model evaluation and statistical significance testing. Applications of data mining and coping with Big Data.

**COMP 5707 [0.5 credit] (CSI 5110)****Principles of Formal Software Development**

Methodologies in formal software specification, development, and verification. The use of theorem proving, automated deduction, and other related formal methods for software correctness. Applications in program verification and secure computation.

**COMP 5709 [0.5 credit] (CSI 5165)****Combinatorial Algorithms**

Design of algorithms for solving problems that are combinatorial in nature, involving exhaustive generation, enumeration, search and optimization. Algorithms for generating basic combinatorial objects and for solving hard optimization problems. Metaheuristic search, backtracking, branch-and-bound. Computing isomorphism of combinatorial objects.

**COMP 5801 [0.5 credit] (CSI 5388)****Topics in Machine Learning****COMP 5805 [0.5 credit] (CSI 5166)****Applications of Combinatorial Optimization**

Topics in combinatorial optimization with emphasis on applications in Computer Science. Topics include network flows, various routing algorithms, polyhedral combinatorics, and the cutting plane method.

**COMP 5808 [0.5 credit]****Trusted Computing and Emerging Attacks**

A systematic discussion of current threats to code execution and the paradigm of employing hardware to achieve secure code execution. Topics include state-of-the-art security hardware support including trusted execution environments on various platforms/architectures, and applications of such hardware support to address various attack vectors.

**COMP 5900 [0.5 credit] (CSI 5140)****Special Topics in Computer Science**

Special topics not covered by other graduate courses. Details will be available from the School at the time of registration.

**COMP 5901 [0.5 credit] (CSI 5901)****Directed Studies (M.C.S.)**

A course of independent study under the supervision of a member of the School of Computer Science.

**COMP 5903 [1.0 credit] (CSI 6900)****Graduate Project (M.C.S.)**

A one- or two-session course. For M.C.S. non-thesis option students only.

**COMP 5905 [2.5 credits] (THM 7999)****M.C.S. Thesis****COMP 5913 [0.0 credit] (CGI 6001/CGI 6002)****Master's Co-operative Work Term****COMP 6100 [0.5 credit] (CSI 7131)****Advanced Parallel and Systolic Algorithms**

Continuation of COMP 5704.

**COMP 6104 [0.5 credit] (CSI 7314)****Advanced Topics in Object-Oriented Systems**

Advanced object-oriented software engineering, in particular the issues of reuse and testing. Sample topics include: interaction modeling; class and cluster testing; traceability; design patterns and testing; the C++ standard template library. Students will carry out research.

**COMP 6601 [0.5 credit] (CSI 7160)****Advanced Topics in the Theory of Computing****COMP 6602 [0.5 credit] (CSI 7170)****Advanced Topics in Distributed Computing****COMP 6603 [0.5 credit] (CSI 7161, CSI 7561)****Advanced Topics in Programming Systems and Languages****COMP 6604 [0.5 credit] (CSI 7162)****Advanced Topics in Computer Applications****COMP 6605 [0.5 credit] (CSI 7163)****Advanced Topics in Computer Systems****COMP 6901 [0.5 credit] (CSI 7901)****Directed Studies (Ph.D.)****COMP 6902 [0.5 credit] (CSI 7900)****Graduate Project (Ph.D.)****COMP 6907 [0.0 credit] (CSI 9998)****Doctoral Comprehensive**

Committee assembled approves at least 3 topics for written examination: typically, a major and two minor areas. An oral examination occurs if the written exam is passed. Both elements must take place within the first 4 terms following initial registration in the program. The comprehensive may be failed, passed conditionally (i.e., with extra course requirements) or passed unconditionally. If failed this course may be retaken at most one time.

**COMP 6908 [0.0 credit] (CSI 9997)****Doctoral Proposal**

Within 8 terms following initial registration in the program, a document generally defining the problem addressed, relating it to the literature, and outlining the hypotheses, goals, research methodology, initial results and validation approach must be submitted to an examination committee and successfully defended.

**COMP 6909 [0.0 credit] (CSI 9999)****Ph.D. Thesis**

## Cultural Mediations

This section presents the requirements for programs in:

- **Ph.D. Cultural Mediations**

**Program Requirements****Ph.D. Cultural Mediations (5.0 credits)****Requirements:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLMD 6101 [1.0]	Perspectives on Interdisciplinarity in Cultural Theory	
<b>2. 1.5 credits in</b>	approved CLMD courses. Up to 0.5 credit may be taken in a related program, subject to the approval of the Graduate Coordinator.	<b>1.5</b>
<b>3. 0.5 credit in:</b>		<b>0.5</b>
CLMD 6900 [0.5]	Research and Professional Development	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
CLMD 6907 [1.0]	Comprehensive I	
CLMD 6908 [1.0]	Comprehensive II	
<b>5. 0.0 credits in:</b>		<b>0.0</b>
CLMD 6909 [0.0]	Ph.D. Thesis	
<b>Total Credits</b>		<b>5.0</b>

**Language Requirements**

Upon graduation, each student is expected to be proficient in one language (preferably French) in addition to English. Additionally, students will be expected to deal with all material that is their primary object of research in its original language. The graduate coordinator should be consulted about the fulfillment of language requirements.

**Comprehensive Examinations**

Students are required to pass two written comprehensive examinations. Each comprehensive has a 1.0 credit value:

- The first comprehensive will be a general examination of the broad range of cultural theory of the twentieth century;
- The second comprehensive will be a discipline-specific examination from one of the following four areas of specialization chosen by the student:
  - Literary Studies
  - Visual Culture
  - Musical Culture
  - Technology and Culture

**Thesis**

All students are required to complete a thesis in partial fulfillment of the requirements of the degree offered by the program. The thesis must be defended at an oral examination.

All students will be required to prepare, present and defend a thesis proposal before proceeding to the writing of the thesis. The proposal will be discussed and defended before the members of the thesis advisory committee at an oral defense chaired by the graduate supervisor.

The program appoints a doctoral thesis advisory committee, the chair of which shall be the student's thesis supervisor. The committee will consist of at least three

members of the university faculty, at least two of whom will be core (or associate) faculty in the program. The advisory committee shall determine when a thesis may go forward for examination.

### **Regulations**

See the General Regulations section of this Calendar.

Doctoral students are required to obtain a grade of B- or better in each course counted toward the fulfillment of the requirements of the degree.

### **Admission**

The normal requirement for admission to the Ph.D. program in either a full-time or part-time capacity is an M.A. (or a recognized equivalent) in a discipline appropriate to the interdisciplinary strengths of the program.

A GPA of 10.0 (A-) or higher is required of course work completed at the master's level.

Appropriate disciplines might include English or French Literature, Art History, Film Studies, Music, Comparative Literature, Anthropology, Canadian Studies, Communication, Geography, History, Philosophy, Sociology, Gender Studies.

### **Cultural Mediations (CLMD) Courses**

#### **CLMD 6101 [1.0 credit]**

##### **Perspectives on Interdisciplinarity in Cultural Theory**

Theory and practice of interdisciplinary studies of culture. Attention will be paid to those issues in cultural theory of the twentieth century that inform interdisciplinary work today in literature, film, music, art and new media.

#### **CLMD 6102 [0.5 credit]**

##### **Issues in Transnationalism**

This course will consider cultural production in the context of global exchange, examining the processes of mediation -- conflict, collaboration, transformation and hybridization -- that govern the movement of populations, objects, and ideas as they travel across borders and between societies.

#### **CLMD 6103 [0.5 credit]**

##### **Issues of Cultural Mediation and Representation**

This course will examine how works from different cultures or works in the same or different media from the same culture pose questions about the nature of representation, interpretation, meaning and affect. Emphasis will be upon the relation between social intelligibility and textual features.

#### **CLMD 6104 [0.5 credit]**

##### **Issues in Cultural Politics**

The theory of the subject and its relations, with examples from specific cultural practices in literary studies, film, music, art, popular culture and new media.

#### **CLMD 6105 [0.5 credit]**

##### **Issues in the Technologies of Culture**

The role that technology plays in changing models of literacy, visibility and aurality. The technologies of the cultures of print, vision and sound will be discussed through specific examples of cultural practices in various media.

#### **CLMD 6106 [0.5 credit]**

##### **Issues in History and Culture**

History as an object of representation and a condition of human experience. Historical approaches to print, visual, and auditory culture in relation to theoretical texts and specific periods and genres. Topics may include history and the novel, visual culture in history, and historiography.

#### **CLMD 6900 [0.5 credit]**

##### **Research and Professional Development**

Students develop research methods to prepare for their second comprehensive examination and to write and defend the doctoral dissertation successfully. Practices of academic publishing, conference presentations and academic articles; grant writing, ethical conduct in research and private and public sector employment opportunities.

#### **CLMD 6901 [0.5 credit]**

##### **Directed Readings in Cultural Mediations**

This tutorial is designed to permit students to pursue research on topics chosen in consultation with members of faculty and the graduate supervisor.

#### **CLMD 6902 [0.5 credit]**

##### **Special Topic in Cultural Mediations**

This in-class course offers selected topics in interdisciplinary studies of culture not available in the regular course offerings.

#### **CLMD 6903 [0.5 credit]**

##### **Special Topic in Cultural Mediations**

This in-class course offers selected topics in interdisciplinary studies of culture not available in the regular course offerings.

#### **CLMD 6904 [0.5 credit]**

##### **Special Topic in Cultural Mediations**

This in-class course offers selected topics in interdisciplinary studies of culture not available in the regular course offerings.

**CLMD 6907 [1.0 credit]**  
**Comprehensive I**

A general examination of the broad range of cultural theory of the twentieth century as it informs interdisciplinary work today and the historical, intellectual and cultural frames of reference that this work invokes.

**CLMD 6908 [1.0 credit]**  
**Comprehensive II**

A discipline-specific examination in a specialized area of study chosen by the student in consultation with the graduate supervisor. Students will choose from one of the following comprehensive areas: Literary Studies; Visual Culture; Musical Culture; New Technologies.

**CLMD 6909 [0.0 credit]**  
**Ph.D. Thesis**

Includes: Experiential Learning Activity

## Curatorial Studies (Graduate Diplomas)

This section presents the requirements for programs in:

• **Graduate Diploma in Curatorial Studies**

### Program Requirements

The Type 2 and Type 3 master's level graduate diplomas are designed to serve professional development needs. The Type 2 diploma is for graduate students in other Carleton programs who seek to strengthen or broaden their conceptual and technical skills in curatorial studies. The Type 3 diploma is for individuals who are not currently registered in a Carleton graduate program. Both diplomas have the same requirements and are comprised of 3.0 credits, and are designed to be completed in one year (twelve months). Students may take the program on either a part-time or full-time basis.

**Cognate Courses:** All cognate courses will be determined in collaboration between the student, the Assistant Director of Curatorial Studies, and the Graduate Supervisor of the cognate department. For students with significant disciplinary knowledge, courses from the School of Business may be more appropriate as cognate courses.

### Graduate Diploma in Curatorial Studies (3.0 credits)

**Requirements:**

<b>1. 0.5 credit in:</b>	0.5
CURA 5000 [0.5]	Curatorial Studies Proseminar
<b>2. 0.5 credit from:</b>	0.5
CURA 5001 [0.5]	Curatorial Studies Pro-seminar: Visual Arts Stream
CURA 5002 [0.5]	Curatorial Studies Pro-seminar: Material and Intangible Cultures Stream
<b>3. 1.0 credit from:</b>	1.0
CURA 5011 [0.5]	Curatorial Studies Practicum 1
CURA 5012 [0.5]	Curatorial Studies Practicum 2
CURA 5013 [0.5]	Directed Exhibition Proposal
<b>4. 1.0 credit in cognate discipline, which may be selected from:</b>	1.0
ANTH 5706 [0.5]	Contemporary Material Cultures
ARCC 5401 [0.5]	Workshop: Technical Studies in Heritage Conservation
ARCH 5000 [0.5]	Directed Studies in History and Theory of Architecture
ARCH 5001 [0.5]	Topics in Architecture
ARCH 5002 [0.5]	Architecture Seminar II
ARCH 5100 [0.5]	Directed Studies in Architecture and Society
ARCH 5200 [0.5]	Graduate Seminar 1: Introduction to Critical Thought in Architecture
ARTH 5010 [1.0]	Theory and Practice of Art and Architectural History
ARTH 5112 [0.5]	Special Topics in Historiography, Methodology and Criticism
ARTH 5113 [0.5]	Special Topics in Pre-Modernity

ARTH 5114 [0.5]	Special Topics in Feminism and Gender
ARTH 5115 [0.5]	Special Topics in Modern and Contemporary Art
ARTH 5117 [0.5]	Special Topics in Community/ Identity
ARTH 5210 [0.5]	Special Topics in Indigenous Art
ARTH 5218 [0.5]	Special Topics in Museum Studies and Curatorial Practice
ARTH 5403 [0.5]	Special Topics in Architecture and Its Institutions
ARTH 5500 [0.5]	Special Topics in Photography and Its Institutions
ARTH 5788 [0.5]	Directed Art Exhibition
CDNS 5002 [0.5]	Interdisciplinary Methods
CDNS 5101 [0.5]	Indigenous Peoples, Canada and the North
CDNS 5301 [0.5]	Canadian Cultural Studies
CDNS 5302 [0.5]	Canadian Cultural Policy
CDNS 5401 [0.5]	Heritage Conservation: History, Principles, and Concepts
CDNS 5402 [0.5]	Heritage Conservation: Theory in Practice
CDNS 5501 [0.5]	Decolonizing Canada: Cultural Politics and Collective Identities
CDNS 5601 [0.5]	Constructing Canada: The Politics of National Identity
CLMD 6102 [0.5]	Issues in Transnationalism
CLMD 6103 [0.5]	Issues of Cultural Mediation and Representation
CLMD 6105 [0.5]	Issues in the Technologies of Culture
CLMD 6106 [0.5]	Issues in History and Culture
CURA 5003 [0.5]	Special Topics in Curatorial Studies
DIGH 5000 [0.5]	Issues in the Digital Humanities
DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities
DIGH 5800 [0.0]	Digital Humanities: Professional Development
DIGH 5902 [0.5]	Special Topics in Digital Humanities
ERTH 5104 [0.5]	Mineralogy
ERTH 5215 [0.5]	Natural Hazards in Canada - Risk and Impact
ERTH 5306 [0.5]	Paleobiology
ERTH 5903 [0.5]	Field Studies
HIST 5701 [0.5]	Archival Theory and Practice
HIST 5702 [0.5]	Public History Special Topics
HIST 5705 [0.5]	Museums, National Identity and Public Memory
MUSI 5007 [0.5]	Music and Visual Culture
MUSI 5008 [0.5]	Technologies of Music
MUSI 5011 [0.5]	Music and Social Institutions
MUSI 5015 [0.5]	Music, Migration and Diaspora in Canada
MUSI 5016 [0.5]	First Peoples Music in Canada
MUSI 5300 [0.5]	Practicum in Music
SOCI 5306 [0.5]	Cultural Studies
SOCI 5406 [0.5]	Citizenship and Globalization
WGST 5001 [0.5]	Research Seminar in Women's and Gender Studies

WGST 5901 [0.5] Advanced Topics in Women's and Gender Studies I

WGST 5906 [0.5] Feminist Theory

Note: additional cognate courses will be considered with the permission of the Director.

**Total Credits**

**3.0**

## Regulations

See the General Regulations section of this Calendar.

All candidates are required to obtain a grade of B- or higher in each course in the program.

## Admission

The minimum requirement for admission to the Diploma in Curatorial Studies is an honours bachelor's degree (or equivalent) in a related discipline, with an average of B+ or higher. Students pursuing a Type 2 diploma must also fulfil the admission requirements of their home departments.

Students wishing to obtain admission will be required to submit an application along with a statement of intent, reference letters, and a writing sample or curatorial portfolio.

## Curatorial Studies (CURA) Courses

### CURA 5000 [0.5 credit]

#### Curatorial Studies Proseminar

This proseminar explores a range of historical, social, economic, educational, ethical, legal, technological and administrative issues concerning the world of museums and related institutions.

### CURA 5001 [0.5 credit]

#### Curatorial Studies Pro-seminar: Visual Arts Stream

Practical examination of art exhibition practices; site visits and workshops designed to help students develop curatorial skills and navigate the museum world. This course trains students in the core competencies of curatorial practice.

Includes: Experiential Learning Activity

### CURA 5002 [0.5 credit]

#### Curatorial Studies Pro-seminar: Material and Intangible Cultures Stream

Taught in collaboration with an institution in the National Capital Region. Development of practical and professional competencies with focus on issues specific to curatorial practice in natural and cultural history museums, interpretation/discovery centres, and science centres.

### CURA 5003 [0.5 credit]

#### Special Topics in Curatorial Studies

Analysis of selected topics relevant to theory, research, and practice in Curatorial Studies. The choice of topics will vary and will be announced in advance of the registration period.

**CURA 5011 [0.5 credit]**  
**Curatorial Studies Practicum 1**

Practical on-site work in the collecting and programming institutions of the National Capital Region (as available), including a written assignment.

Includes: Experiential Learning Activity

**CURA 5012 [0.5 credit]**  
**Curatorial Studies Practicum 2**

Practical on-site work in the collecting and programming institutions of the National Capital Region (as available), including a written assignment.

Includes: Experiential Learning Activity

**CURA 5013 [0.5 credit]**  
**Directed Exhibition Proposal**

Project-oriented course focused on an immersive engagement with institutional curatorial practices. Completion and presentation of an individual exhibition proposal for submission to a professional institution. Stage-by-stage approach covering all required aspects of proposal development. Seminar format with thematic workshops, guest interventions, group discussions, progress reports.

Includes: Experiential Learning Activity

## Cybersecurity (Collaborative Specialization)

This section presents the requirements for programs in:

- **M.C.S. Computer Science with Collaborative Specialization in Cybersecurity**
- **M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Cybersecurity**
- **M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Cybersecurity**
- **M.Eng. Infrastructure Protection and International Security with Collaborative Specialization in Cybersecurity**
- **M.A.Sc. Digital Media with Collaborative Specialization in Cybersecurity**
- **Master of Networking Technology with Collaborative Specialization in Cybersecurity**
- **M. Infrastructure Protection and International Security with Collaborative Specialization in Cybersecurity**
- **M.A. International Affairs with Collaborative Specialization in Cybersecurity**

### Program Requirements

#### **M.C.S. Computer Science with Collaborative Specialization in Cybersecurity (5.0 credits)**

##### **Requirements - Thesis pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 1.5 credits in</b>	course work. Course work must include a minimum of 1.5 credits of OCICS courses in three different research areas (see OCICS course listing by research areas).	<b>1.5</b>
<b>3. 2.5 credits in</b>	graduate thesis (Each candidate submitting a thesis will be required to undertake an oral defence of the thesis).	<b>2.5</b>
COMP 5905 [2.5]	M.C.S. Thesis (in the area of the specialization)	
<b>Total Credits</b>		<b>5.0</b>

##### **Requirements - Non-Thesis pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 3.0 credits in</b>	course work. Course work must include a minimum of 1.5 credits of OCICS courses in three different research areas (see OCICS course listing by research areas).	<b>3.0</b>
<b>3. 1.0 credit in</b>	Graduate project OR additional OCICS courses.	<b>1.0</b>
COMP 5903 [1.0]	Graduate Project (M.C.S.) (in the area of the specialization)	
OR		
	1.0 credits of additional OCICS courses	
<b>Total Credits</b>		<b>5.0</b>

## M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Cybersecurity (5.0 credits)

### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
<b>3. 1.5 credits in courses</b>	<b>1.5</b>
<b>4. 2.5 credits in:</b>	<b>2.5</b>
SYSC 5909 [2.5]	M.A.Sc. Thesis (in the area of cybersecurity)
<b>Total Credits</b>	<b>5.0</b>

## M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Cybersecurity (4.5 credits)

### Requirements - project pathway (4.5 credits)

<b>1. 0.5 credit in:</b>	<b>0.5</b>
SYSC 5902 [0.5]	Research Methods for Engineers
<b>2. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
<b>4. 2.5 credits in courses</b>	<b>2.5</b>
<b>5. 0.5 credit in:</b>	<b>0.5</b>
SYSC 5900 [0.5]	Systems Engineering Project (in the area of cybersecurity)
<b>Total Credits</b>	<b>4.5</b>

### Requirements - coursework pathway (4.5 credits)

<b>1. 0.5 credit in:</b>	<b>0.5</b>
SYSC 5902 [0.5]	Research Methods for Engineers
<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
<b>4. 3.0 credits in courses, including 0.5 credit in approved elective in the area of the specialization</b>	<b>3.0</b>
<b>Total Credits</b>	<b>4.5</b>

## M.Eng. Infrastructure Protection and International Security with Collaborative Specialization in Cybersecurity (5.0 credits)

### Requirements - Research project pathway:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
<b>2. 1.5 credits in:</b>	<b>1.5</b>
IPIS 5101 [0.5]	Critical Infrastructure Protection: Issues and Strategies
IPIS 5105 [0.5]	Critical Infrastructure Risk Assessment
IPIS 5106 [0.5]	Management of Critical Infrastructure
<b>3. 0.5 credit from:</b>	<b>0.5</b>
IPIS 5104 [0.5]	Terrorism and International Security
IPIS 5301 [0.5]	Disarmament, Arms Control and Nonproliferation
IPIS 5302 [0.5]	Contemporary International Security

IPIS 5303 [0.5]	Intelligence Statecraft and International Affairs
IPIS 5304 [0.5]	Intelligence and National Security: Policies and Operations
IPIS 5305 [0.5]	National Security Policy and Law
IPIS 5306 [0.5]	Emergency and Business Continuity Management
IPIS 5320 [0.5]	Topics in Infrastructure Security Policy

Or 5000-level courses from the Intelligence and International Affairs (IIA) and Security Defence Policy (SDP) designated fields offered by the Norman Paterson School of International Affairs.

<b>4. 1.0 credit from:</b>	<b>1.0</b>
IPIS 5501 [0.5]	Transportation and Aviation Security
IPIS 5504 [0.5]	Fundamentals of Fire Safety
IPIS 5505 [0.5]	Natural Hazards in Canada: Risk and Impact
IPIS 5507 [0.5]	Blast Load Effects on Structures
IPIS 5508 [0.5]	Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components
IPIS 5509 [0.5]	Introduction to Cybersecurity
IPIS 5520 [0.5]	Selected Topics in Engineering of Critical Infrastructure

or an engineering course approved by the IPIS Director or Associate Director.

<b>5. 1.0 credit in:</b>	<b>1.0</b>
IPIS 5907 [1.0]	Research Project (in the area of the specialization)
<b>Total Credits</b>	<b>5.0</b>

### Requirements - Coursework pathway:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
<b>2. 1.5 credits in:</b>	<b>1.5</b>
IPIS 5101 [0.5]	Critical Infrastructure Protection: Issues and Strategies
IPIS 5105 [0.5]	Critical Infrastructure Risk Assessment
IPIS 5106 [0.5]	Management of Critical Infrastructure
<b>3. 1.0 credit from:</b>	<b>1.0</b>
IPIS 5104 [0.5]	Terrorism and International Security
IPIS 5301 [0.5]	Disarmament, Arms Control and Nonproliferation
IPIS 5302 [0.5]	Contemporary International Security
IPIS 5303 [0.5]	Intelligence Statecraft and International Affairs
IPIS 5304 [0.5]	Intelligence and National Security: Policies and Operations
IPIS 5305 [0.5]	National Security Policy and Law
IPIS 5306 [0.5]	Emergency and Business Continuity Management
IPIS 5320 [0.5]	Topics in Infrastructure Security Policy

Or 5000-level courses from the Intelligence and International Affairs (IIA) and Security Defence Policy (SDP) designated fields offered by the Norman Paterson School of International Affairs.

<b>4. 1.0 credit from:</b>	<b>1.0</b>
IPIS 5501 [0.5]      Transportation and Aviation Security	
IPIS 5504 [0.5]      Fundamentals of Fire Safety	
IPIS 5505 [0.5]      Natural Hazards in Canada: Risk and Impact	
IPIS 5507 [0.5]      Blast Load Effects on Structures	
IPIS 5508 [0.5]      Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components	
IPIS 5509 [0.5]      Introduction to Cybersecurity	
IPIS 5520 [0.5]      Selected Topics in Engineering of Critical Infrastructure	
or an engineering course approved by the IPIS Director or Associate Director.	
<b>5. 0.5 credit in</b> approved electives in the area of the specialization	
<b>6. 0.5 credit from</b> graduate courses from the Faculty of Engineering and Design that have been selected in consultation with, and approved by, the MIPIS Director and Associate Director.	<b>0.5</b>
<b>Total Credits</b>	<b>5.0</b>

### M.A.Sc. Digital Media with Collaborative Specialization in Cybersecurity (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]      Science and Social Science of Cybersecurity	
<b>2. 0.0 credit in:</b>	
ITEC 5001 [0.0]      Information Technology Seminars	
<b>3. 1.5 credit from</b> core courses:	<b>1.5</b>
ITEC 5002 [0.5]      Fundamentals of Information Technology Research	
ITEC 5200 [0.5]      Entertainment Technologies	
ITEC 5201 [0.5]      Computer Animation Technologies	
ITEC 5202 [0.5]      Visual Effects Technologies	
ITEC 5203 [0.5]      Game Design and Development Technologies	
ITEC 5204 [0.5]      Emerging Interaction Techniques	
ITEC 5205 [0.5]      Design and Development of Data-Intensive Applications	
ITEC 5206 [0.5]      Data Protection and Rights Management	
ITEC 5207 [0.5]      Data Interaction Techniques	
ITEC 5208 [0.5]      Virtual Reality and 3D User Interfaces	
ITEC 5209 [0.5]      Empirical Research Methods in HCI	
ITEC 5920 [0.5]      Special Topics in Digital Media	
<b>5. 2.5 credits in:</b>	<b>2.5</b>
ITEC 5909 [2.5]      Master's Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

### Master of Networking Technology with Collaborative Specialization in Cybersecurity (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]      Science and Social Science of Cybersecurity	
<b>2. 0.0 credit in:</b>	
ITEC 5001 [0.0]      Information Technology Seminars	
<b>3. 2.0 credits from</b> core courses:	<b>2.0</b>
ITEC 5100 [0.5]      Planning and Design of Computer Networks	
ITEC 5101 [0.5]      Cross Layer Design for Wireless Multimedia Networks	
ITEC 5102 [0.5]      Designing Secure Networking and Computer Systems	
ITEC 5103 [0.5]      Cloud and Datacentre Networking	
ITEC 5205 [0.5]      Design and Development of Data-Intensive Applications	
ITEC 5910 [0.5]      Special Topics in Network Technologies	
<b>4. 0.5 credit in</b> the area of the specialization, approved by the graduate supervisor or the Associate Director of Graduate Studies in the School.	<b>0.5</b>
<b>5. 1.5 credits in</b> electives at the 5000-level, chosen in consultation with your graduate advisor/supervisor or the Associate Director of Graduate Studies in the School.	<b>1.5</b>
<b>Total Credits</b>	<b>5.0</b>

### M. Infrastructure Protection and International Security with Collaborative Specialization in Cybersecurity (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]      Science and Social Science of Cybersecurity	
<b>2. 2.0 credits in:</b>	<b>2.0</b>
IPIS 5101 [0.5]      Critical Infrastructure Protection: Issues and Strategies	
IPIS 5103 [0.5]      Infrastructure Engineering Principles	
IPIS 5105 [0.5]      Critical Infrastructure Risk Assessment	
IPIS 5106 [0.5]      Management of Critical Infrastructure	
<b>3. 1.0 credit from:</b>	<b>1.0</b>
IPIS 5104 [0.5]      Terrorism and International Security	
IPIS 5301 [0.5]      Disarmament, Arms Control and Nonproliferation	
IPIS 5302 [0.5]      Contemporary International Security	
IPIS 5303 [0.5]      Intelligence Statecraft and International Affairs	
IPIS 5304 [0.5]      Intelligence and National Security: Policies and Operations	
IPIS 5305 [0.5]      National Security Policy and Law	
IPIS 5306 [0.5]      Emergency and Business Continuity Management	

IPIS 5320 [0.5]	Topics in Infrastructure Security Policy	
Or 5000-level courses from the IIA or SDP designated fields offered by the Norman Paterson School of International Affairs.		
<b>4. 0.5 credit from:</b>		<b>0.5</b>
IPIS 5501 [0.5]	Transportation and Aviation Security	
IPIS 5504 [0.5]	Fundamentals of Fire Safety	
IPIS 5505 [0.5]	Natural Hazards in Canada: Risk and Impact	
IPIS 5507 [0.5]	Blast Load Effects on Structures	
IPIS 5508 [0.5]	Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components	
IPIS 5509 [0.5]	Introduction to Cybersecurity	
IPIS 5520 [0.5]	Selected Topics in Engineering of Critical Infrastructure	
<b>5. 0.5 credit in</b> elective in the area of the specialization, selected in consultation with, and approved by, the MIPIS Director and Associate Director and associated faculty when necessary.		<b>0.5</b>
<b>Total Credits</b>		<b>5.0</b>

### M.A. International Affairs with Collaborative Specialization in Cybersecurity (5.0 credits)

#### Requirements - Thesis pathway

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 1.5 credits in:</b>		<b>1.5</b>
INAF 5015 [0.5]	Research Design and Methods for International Affairs	
INAF 5016 [0.5]	Statistical Analysis for International Affairs	
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	
<b>3. 0.5 credit in</b> economics, successfully completed by the end of the second term, from (See Note 1, below):		<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5221 [0.5]	Economics of Security and Intelligence	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
INAF 5909 [2.0]	M.A. Thesis (in the specialization)	
5. Successful completion of second language proficiency examination (See Note 3, below)		
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 1.5 credit in:</b>		<b>1.5</b>
INAF 5015 [0.5]	Research Design and Methods for International Affairs	
INAF 5016 [0.5]	Statistical Analysis for International Affairs	
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	
<b>3. 0.5 credit in</b> economics, successfully completed by the end of the second term, from: (See Note 1, below)		<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5221 [0.5]	Economics of Security and Intelligence	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
INAF 5908 [1.0]	Research Essay (in the specialization)	
<b>5. 1.0 credits in</b> Field and Elective courses (See Note 2, below)		<b>1.0</b>
6. Successful completion of second language proficiency examination (see Note 3, below)		
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
INAF 5016 [0.5]	Statistical Analysis for International Affairs	
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	
<b>3. 0.5 credit in</b> economics, successfully completed by the end of the second term, from: (See Note 1, below)		<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5221 [0.5]	Economics of Security and Intelligence	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	

INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>4. 0.5 credit</b>	in courses in the area of the specialization and approved by the NPSIA M.A. Program Supervisor or Associate Director as being relevant to the student's program of study.	0.5
<b>5. 2.0 credits</b>	in Field and Elective courses (See Note 2, below)	2.0
6.	Successful completion of second language proficiency examination (see Note 3, below)	
<b>Total Credits</b>		<b>5.0</b>
<ol style="list-style-type: none"> <li>All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309, or approved equivalent, must be completed.</li> <li>For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.</li> <li>Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Details of the language requirement are provided on the School website.</li> </ol>		

## Regulations

See the General Regulations section of this Calendar and the regulations of the participating unit.

## Admission Requirements

Admission to the collaborative master's program in Cybersecurity is available to master's students who are admitted in one of the participating master's programs. To apply to one of the participating master's programs, please visit the Graduate Studies Admissions page.

## Cybersecurity (CYBR) Courses

### CYBR 5000 [1.0 credit]

#### Science and Social Science of Cybersecurity

Overview of legal, governance, and strategic considerations of cybersecurity from a Canadian and international perspective, and the computer science and engineering concepts critical to effective cybersecurity operations.

## Data Science (Collaborative Specialization)

This section presents the requirements for programs in:

- **M.Sc. Biology with Collaborative Specialization in Data Science**
- **M.A.Sc. Biomedical Engineering with Collaborative Specialization in Data Science**
- **M.Eng. Biomedical Engineering with Collaborative Specialization in Data Science**
- **M.Sc. in Chemistry with Collaborative Specialization in Data Science**
- **Master of Cognitive Science with Collaborative Specialization in Data Science**
- **M.A. Communication with Collaborative Specialization in Data Science**
- **M.C.S. Computer Science with Collaborative Specialization in Data Science**
- **M.A. Economics with Collaborative Specialization in Data Science**
- **M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Data Science**
- **M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Data Science**
- **M.A. Geography with Collaborative Specialization in Data Science**
- **M.Sc. Geography with Collaborative Specialization in Data Science**
- **M.Sc. Health Sciences with Collaborative Specialization in Data Science**
- **M.A. History with Collaborative Specialization in Data Science**
- **M.A. International Affairs with Collaborative Specialization in Data Science**
- **M.A.Sc. Digital Media with Collaborative Specialization in Data Science**
- **M.Sc. Physics Medical Physics Stream with Collaborative Specialization in Data Science**
- **M.Sc. Physics Particle Physics Stream with Collaborative Specialization in Data Science**
- **M.A. Psychology with Collaborative Specialization in Data Science**
- **Master of Public Policy and Administration with Collaborative Specialization in Data Science**
- **M.A. Sociology with Collaborative Specialization in Data Science**

## Program Requirements

Students enrolled in the Collaborative Program in Data Science must meet the requirements of their respective home units as well as those of the Collaborative Program. The requirements of the Collaborative Program do not, however, add to the number of credits students are required to accumulate by their home unit and the credit value of the degree remains the same. Consult the individual programs for detailed program requirements.

## M.Sc. Biology with Collaborative Specialization in Data Science (5.0 credits)

### Requirements:

1. 0.5 credit in approved coursework	0.5
2. 0.5 credit in:	0.5
DATA 5000 [0.5] Introduction to Data Science	
3. 4.0 credits in:	4.0
BIOL 5909 [3.5] M.Sc. Thesis (in the specialization, including successful oral defence)	
<b>Total Credits</b>	<b>5.0</b>

## M.A.Sc. Biomedical Engineering with Collaborative Specialization in Data Science (5.0 credits)

### Requirements:

1. 0.5 credit in:	0.5
BIOM 5010 [0.5] Introduction to Biomedical Engineering	
2. 0.5 credit in:	0.5
DATA 5000 [0.5] Introduction to Data Science	
3. 1.0 credit in BIOM (BMG) courses	1.0
4. 0.5 credit in elective courses taken either at Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	0.5
5. 2.5 credits in:	2.5
BIOM 5909 [2.5] M.A.Sc. Thesis (in the specialization)	
6. 0.0 credit in:	0.0
BIOM 5800 [0.0] Biomedical Engineering Seminar	
<b>Total Credits</b>	<b>5.0</b>

**Note:** for the course work **Item 3** and **Item 4** above, one 0.5 credit data science elective course must be taken (one of BIOM 5202, BIOM 5405, COMP 5100, COMP 5101, COMP 5107, COMP 5108, COMP 5111, COMP 5112, COMP 5204, COMP 5209, COMP 5305, COMP 5306, COMP 5307, COMP 5308, COMP 5401, COMP 5703, COMP 5704, PHYS 5002, SYSC 5001, SYSC 5004, SYSC 5101, SYSC 5103, SYSC 5108, SYSC 5201, SYSC 5207, SYSC 5303, SYSC 5306, SYSC 5401, SYSC 5405, SYSC 5407, SYSC 5500, SYSC 5703).

## M.Eng. Biomedical Engineering with Collaborative Specialization in Data Science (5.0 credits)

### Requirements - by coursework:

1. 0.5 credit in:	0.5
BIOM 5010 [0.5] Introduction to Biomedical Engineering	
2. 0.5 credit in:	0.5
DATA 5000 [0.5] Introduction to Data Science	
3. 2.0 credits in BIOM (BMG) courses	2.0
4. 2.0 credits in elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	2.0
5. 0.0 credit in:	

BIOM 5800 [0.0] Biomedical Engineering Seminar

**Total Credits** **5.0**

**Note:** for the course work Item 3 and Item 4 above, three 0.5-credit data science elective courses must be taken (three of BIOM 5405, COMP 5100, COMP 5101, COMP 5107, COMP 5108, COMP 5111, COMP 5112, COMP 5204, COMP 5209, COMP 5305, COMP 5306, COMP 5307, COMP 5308, COMP 5401, COMP 5703, COMP 5704, PHYS 5002, SYSC 5001, SYSC 5004, SYSC 5101, SYSC 5103, SYSC 5108, SYSC 5201, SYSC 5207, SYSC 5303, SYSC 5306, SYSC 5401, SYSC 5405, SYSC 5407, SYSC 5500, SYSC 5703).

### Requirements - by project:

1. 0.5 credit in:	0.5
BIOM 5010 [0.5] Introduction to Biomedical Engineering	
2. 0.5 credit in:	0.5
DATA 5000 [0.5] Introduction to Data Science	
3. 1.5 credits in BIOM (BMG) courses	1.5
4. 1.0 credit in elective courses at either Carleton University or University of Ottawa with the approval of the OCIBME Director or Associate Director	1.0
5. 0.0 credit in:	
BIOM 5800 [0.0] Biomedical Engineering Seminar	
6. 1.5 credit in:	1.5
BIOM 5909 [1.5] Biomedical Engineering Project (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

**Note:** for the course work Item 3 and Item 4 above, three 0.5-credit data science elective courses must be taken (three of BIOM 5400, BIOM 5405, COMP 5100, COMP 5101, COMP 5107, COMP 5108, COMP 5111, COMP 5112, COMP 5204, COMP 5209, COMP 5305, COMP 5306, COMP 5307, COMP 5308, COMP 5401, COMP 5703, COMP 5704, PHYS 5002, SYSC 5001, SYSC 5003, SYSC 5004, SYSC 5007, SYSC 5101, SYSC 5102, SYSC 5103, SYSC 5108, SYSC 5201, SYSC 5207, SYSC 5300, SYSC 5303, SYSC 5306, SYSC 5401, SYSC 5404, SYSC 5405, SYSC 5407, SYSC 5500, SYSC 5703, SYSC 5706).

## M.Sc. in Chemistry with Collaborative Specialization in Data Science (5.0 credits)

### Requirements

1. 0.5 credit in:	0.5
DATA 5000 [0.5] Introduction to Data Science	
2. 0.5 credit in:	0.5
CHEM 5810 [0.5] Seminar	
3. 0.5 credit in:	0.5
CHEM 5804 [0.5] Modern Scientific Communication	
4. 0.5 credit in CHEM at the graduate level, which may include up to 0.5 credit in another discipline, with permission of the department.	0.5
5. 3.0 credits in:	3.0
CHEM 5909 [3.0] M.Sc. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

## Master of Cognitive Science with Collaborative Specialization in Data Science (5.0 credits)

### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 0.5 credit in:</b>	0.5
CGSC 5100 [0.5]	Issues in Cognitive Science
<b>3. 0.5 credit in:</b>	0.5
CGSC 5101 [0.5]	Experimental Methods and Statistics
<b>4. 1.0 credit in</b>	1.0
CGSC or other approved courses, from two different cognitive disciplines, selected in consultation with the graduate supervisor.	
<b>5. 2.5 credits in:</b>	2.5
CGSC 5909 [2.5]	M. Cog. Thesis (The thesis must be approved as fulfilling the data science requirement and be supervised by a faculty member working in a data science related field.)
6. Preparation of research for presentation at the Carleton Cognitive Science Spring Conference.	

**Total Credits** 5.0

### Requirements - Research Project pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 0.5 credit in:</b>	0.5
CGSC 5100 [0.5]	Issues in Cognitive Science
<b>3. 0.5 credit in:</b>	0.5
CGSC 5101 [0.5]	Experimental Methods and Statistics
<b>4. 1.5 credits from:</b>	1.5
CGSC 5001 [0.5]	Cognition and Artificial Cognitive Systems
CGSC 5002 [0.5]	Experimental Research in Cognition
CGSC 5003 [0.5]	Language and Cognition
CGSC 5004 [0.5]	Cognition and Conceptual Issues
CGSC 5005 [0.5]	Cognition and Neuroscience
<b>5. 1.0 credit in</b>	1.0
CGSC or other approved courses selected in consultation with the graduate supervisor.	
<b>6. 1.0 credit in:</b>	1.0
CGSC 5908 [1.0]	Research Project (Project must be approved as fulfilling the data science requirement and be supervised by a faculty member working in a data science related field.)

7. Preparation of research for presentation at the Cognitive Science Spring Conference.

**Total Credits** 5.0

## M.A. Communication with Collaborative Specialization in Data Science (5.0 credits)

### Requirements - Coursework pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science

<b>2. 1.0 credit in:</b>	1.0
COMS 5101 [1.0]	Foundations of Communication Studies

<b>3. 0.5 credit in:</b>	0.5
COMS 5605 [0.5]	Approaches to Communication Research

<b>4. 0.5 credit in:</b>	0.5
COMS 5225 [0.5]	Critical Data Studies

<b>5. 0.5 credit from:</b>	0.5
COMS 5203 [0.5]	Communication, Technology, Society
COMS 5221 [0.5]	Science and the Making of Knowledge
COMS 5224 [0.5]	Internet, Infrastructure, Materialities

**6. 2.0 credits in electives** 2.0

**Total Credits** 5.0

### Requirements - Research essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science

<b>2. 1.0 credit in:</b>	1.0
COMS 5101 [1.0]	Foundations of Communication Studies

<b>3. 0.5 credit in:</b>	0.5
COMS 5605 [0.5]	Approaches to Communication Research

<b>4. 0.5 credit in:</b>	0.5
COMS 5225 [0.5]	Critical Data Studies

<b>5. 1.0 credit in:</b>	1.0
COMS 5908 [1.0]	Research Essay

Research Essay on a Data Science topic approved by the Advisory Board representative from Communication in consultation with the graduate Committee of the Institute of Data Science.

**6. 1.5 credits in electives.** 1.5

**Total Credits** 5.0

### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science

<b>2. 1.0 credit in:</b>	1.0
COMS 5101 [1.0]	Foundations of Communication Studies

<b>3. 0.5 credit in:</b>	0.5
COMS 5605 [0.5]	Approaches to Communication Research

<b>4. 0.5 credit in:</b>	0.5
COMS 5225 [0.5]	Critical Data Studies

<b>5. 2.0 credits in:</b>	2.0
COMS 5909 [2.0]	M.A. Thesis

M.A. Thesis on a Data Science topic approved by the Advisory Board representative from Communication in consultation with the Graduate Committee of the Institute of Data Science.

**6. 0.5 credit in electives** 0.5

**Total Credits** 5.0

## M.C.S. Computer Science with Collaborative Specialization in Data Science (5.0 credits)

### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 2.0 credits in</b> course work. Course work must include a minimum of 1.5 credits of OCICS courses in at least three different research areas. See OCICS course listing by research areas.	2.0
<b>3. 2.5 credits in:</b>	2.5
COMP 5905 [2.5]	M.C.S. Thesis (M.C.S. Thesis must be in an area of Data Science and requires approval from the Institute of Data Science. Each candidate submitting a thesis will be required to undertake an oral defence of the thesis.)
<b>Total Credits</b>	<b>5.0</b>

## M.A. Economics with Collaborative Specialization in Data Science (4.0 credits)

### Requirements - Coursework pathway (4.0 credits)

<b>1. 1.5 credits in:</b>	1.5
ECON 5020 [0.5]	Microeconomic Theory
ECON 5021 [0.5]	Macroeconomic Theory
ECON 5027 [0.5]	Econometrics I
<b>2. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>3. 0.5 credit in:</b>	0.5
ECON 5029 [0.5]	Methods of Economic Research including a research paper on a data science related topic
<b>4. 0.5 credit from:</b>	0.5
ECON 5055 [0.5]	Financial Econometrics
ECON 5361 [0.5]	Labour Economics I
ECON 5362 [0.5]	Labour Economics II
ECON 5712 [0.5]	Micro-Econometrics
ECON 5713 [0.5]	Time-Series Econometrics
	or approved Special Topics course (ECON 5880) in the area of Data Science
<b>5. 0.5 credit in</b> ECON approved by the M.A. Supervisor of the Department of Economics	0.5
<b>6. 0.5 credit in</b> Data Science elective (which may be an additional course from the preceding list) approved by the M.A. Supervisor of the Department of Economics	0.5
<b>Total Credits</b>	<b>4.0</b>

### Requirements - Thesis pathway (4.0 credits)

<b>1. 1.5 credits in:</b>	1.5
ECON 5020 [0.5]	Microeconomic Theory
ECON 5021 [0.5]	Macroeconomic Theory
ECON 5027 [0.5]	Econometrics I
<b>2. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>3. 1.5 credit in:</b>	1.5
ECON 5909 [1.5]	M.A. Thesis
	on a data science topic approved by the Data Science governance committee

<b>4. 0.5 credit from:</b>	0.5
ECON 5055 [0.5]	Financial Econometrics
ECON 5361 [0.5]	Labour Economics I
ECON 5362 [0.5]	Labour Economics II
ECON 5712 [0.5]	Micro-Econometrics
ECON 5713 [0.5]	Time-Series Econometrics
	or approved Special Topics course (ECON 5880) in the area of Data Science

**Total Credits 4.0**

## M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Data Science (5.0 credits)

### Requirements - by Thesis (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 0.5 credit from</b> data science elective courses:	0.5
SYSC 5001 [0.5]	Simulation and Modeling
SYSC 5004 [0.5]	Optimization for Engineering Applications
SYSC 5101 [0.5]	Design of High Performance Software
SYSC 5103 [0.5]	Software Agents
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation
SYSC 5201 [0.5]	Computer Communication
SYSC 5207 [0.5]	Distributed Systems Engineering
SYSC 5303 [0.5]	Interactive Networked Systems and Telemedicine
SYSC 5306 [0.5]	Mobile Computing Systems
SYSC 5401 [0.5]	Adaptive and Learning Systems
SYSC 5405 [0.5]	Pattern Classification and Experiment Design
SYSC 5407 [0.5]	Planning and Design of Computer Networks
SYSC 5500 [0.5]	Designing Secure Networking and Computer Systems
SYSC 5703 [0.5]	Integrated Database and Cloud Systems
<b>3. 1.5 credits in</b> courses	1.5
<b>4. 2.5 credits in:</b>	2.5
SYSC 5909 [2.5]	M.A.Sc. Thesis
	in the area of data science (each candidate submitting a thesis will be required to undertake an oral defence of the thesis)
<b>Total Credits</b>	<b>5.0</b>

## M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Data Science (4.5 credits)

### Requirements - by Project (4.5 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 1.0 credit from</b> data science elective courses:	1.0
SYSC 5001 [0.5]	Simulation and Modeling
SYSC 5004 [0.5]	Optimization for Engineering Applications
SYSC 5101 [0.5]	Design of High Performance Software

SYSC 5103 [0.5]	Software Agents	
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5201 [0.5]	Computer Communication	
SYSC 5207 [0.5]	Distributed Systems Engineering	
SYSC 5303 [0.5]	Interactive Networked Systems and Telemedicine	
SYSC 5306 [0.5]	Mobile Computing Systems	
SYSC 5401 [0.5]	Adaptive and Learning Systems	
SYSC 5405 [0.5]	Pattern Classification and Experiment Design	
SYSC 5407 [0.5]	Planning and Design of Computer Networks	
SYSC 5500 [0.5]	Designing Secure Networking and Computer Systems	
SYSC 5703 [0.5]	Integrated Database and Cloud Systems	
<b>3. 2.5 credits in</b>	<b>courses, which may include up to an additional 0.5 credit in project</b>	<b>2.5</b>
<b>4. 0.5 credit in:</b>		<b>0.5</b>
SYSC 5900 [0.5]	Systems Engineering Project in the area of data science	
<b>Total Credits</b>		<b>4.5</b>
<b>Requirements - by Coursework (4.5 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.5 credits from</b>	<b>data science elective courses:</b>	<b>1.5</b>
SYSC 5001 [0.5]	Simulation and Modeling	
SYSC 5004 [0.5]	Optimization for Engineering Applications	
SYSC 5101 [0.5]	Design of High Performance Software	
SYSC 5103 [0.5]	Software Agents	
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5201 [0.5]	Computer Communication	
SYSC 5207 [0.5]	Distributed Systems Engineering	
SYSC 5303 [0.5]	Interactive Networked Systems and Telemedicine	
SYSC 5306 [0.5]	Mobile Computing Systems	
SYSC 5401 [0.5]	Adaptive and Learning Systems	
SYSC 5405 [0.5]	Pattern Classification and Experiment Design	
SYSC 5407 [0.5]	Planning and Design of Computer Networks	
SYSC 5500 [0.5]	Designing Secure Networking and Computer Systems	
SYSC 5703 [0.5]	Integrated Database and Cloud Systems	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
SYSC 5902 [0.5]	Research Methods for Engineers	
<b>4. 2.0 credits in</b>	<b>courses</b>	<b>2.0</b>
<b>Total Credits</b>		<b>4.5</b>
<b>M.A. Geography with Collaborative Specialization in Data Science (5.0 credits)</b>		
<b>Requirements:</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>

DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
GEOG 5000 [0.5]	Approaches to Geographical Inquiry	
<b>3. 2.5 credits in:</b>		<b>2.5</b>
GEOG 5909 [2.5]	M.A. Thesis (in the specialization and including oral examination of the thesis)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
GEOG 5905 [0.5]	Masters Research Workshop	
<b>5. 1.0 credit in</b>	<b>approved graduate-level electives</b>	<b>1.0</b>
6. In addition to the formal requirements, M.A. students are required to attend the Departmental Seminar series, and the Graduate Field Camp.		
<b>Total Credits</b>		<b>5.0</b>

### M.Sc. Geography with Collaborative Specialization in Data Science (5.0 credits)

<b>Requirements:</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
GEOG 5001 [0.5]	Modeling Environmental Systems	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
GEOG 5905 [0.5]	Masters Research Workshop	
<b>4. 0.5 credit in</b>	<b>Physical Geography selected from:</b>	<b>0.5</b>
GEOG 5002 [0.5]	Quantitative Analysis for Geographical Research	
GEOG 5103 [0.5]	Hydrologic Principles and Methods	
GEOG 5104 [0.5]	Advanced Biogeography	
GEOG 5107 [0.5]	Field Study and Methodological Research	
GEOG 5303 [0.5]	Geocryology	
GEOG 5307 [0.5]	Soil Resources	
GEOG 5803 [0.5]	Seminar in Geomatics	
GEOG 5804 [0.5]	Geographic Information Systems	
GEOG 5900 [0.5]	Graduate Tutorial	
up to 0.5 credit in GEOG or GEOM at the 4000 level, with departmental approval		
<b>5. 3.0 credits in:</b>		<b>3.0</b>
GEOG 5906 [3.0]	M.Sc. Thesis (in the specialization and including oral examination of the thesis)	
6. In addition to the formal requirements, M.Sc. students are required to attend the DGES Departmental Seminar series, and the Graduate Field Camp.		
<b>Total Credits</b>		<b>5.0</b>

### M.Sc. Health Sciences with Collaborative Specialization in Data Science (5.5 credits)

<b>Requirements (5.5 credits):</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences	
<b>2. 0.5 credit from:</b>		<b>0.5</b>
HLTH 5902 [0.5]	Seminars in Interdisciplinary Health Sciences for MSc	

or elective, approved by Thesis Supervisor and Graduate Advisor	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5] Introduction to Data Science	
<b>4. 0.0 credit in:</b>	<b>0.0</b>
HLTH 5906 [0.0] Research Seminar Presentation for MSc	
HLTH 5905 [0.0] Final Research Seminar Presentation for MSc	
<b>5. 4.0 credits in:</b>	<b>4.0</b>
HLTH 5909 [4.0] MSc Thesis (in the specialization)	
<b>6. Twice-yearly meetings with the thesis Graduate Advisory Committee, with students meeting a level of progress as determined by the Committee.</b>	
<b>Total Credits</b>	<b>5.5</b>

### M.A. History with Collaborative Specialization in Data Science (4.5 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
HIST 5003 [0.5] Historical Theory and Method	
<b>2. 1.5 credits in HIST</b> at the graduate level of which only 0.5 credit may be taken in a designated public history course; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	<b>1.5</b>
<b>3. 0.5 credit in:</b>	<b>0.5</b>
HIST 5706 [0.5] Digital History	
<b>4. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5] Introduction to Data Science	
<b>5. 0.5 credit in:</b>	<b>0.5</b>
HIST 5900 [0.5] Directed Research	
<b>6. 1.0 credit in:</b>	<b>1.0</b>
HIST 5908 [1.0] M.A. Research Essay (in the specialization)	
<b>Total Credits</b>	<b>4.5</b>

### M.A. International Affairs with Collaborative Specialization in Data Science (5.0 credits)

#### Requirements - Thesis pathway:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5] Introduction to Data Science	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
INAF 5016 [0.5] Statistical Analysis for International Affairs	
INAF 5017 [0.25] International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25] Law and International Affairs	
<b>3. 0.5 credit in Economics</b> , successfully completed by the end of the second term from: (see Note 1, below)	<b>0.5</b>
INAF 5009 [0.5] International Aspects of Economic Development	
INAF 5205 [0.5] Economics of Conflict	
INAF 5214 [0.5] Economics for Defence and Security	
INAF 5308 [0.5] International Trade: Theory and Policy	

INAF 5309 [0.5] International Finance: Theory and Policy	
INAF 5600 [0.5] The Economics of Human Development	
INAF 5703 [0.5] International Public Economics	
<b>4. 2.0 credits in:</b>	<b>2.0</b>
INAF 5909 [2.0] M.A. Thesis (in the specialization)	
<b>5. 1.0 credit in Field or Elective courses</b>	<b>1.0</b>
6. Successful completion of second language proficiency examination (See Note 4, below)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5] Introduction to Data Science	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
INAF 5016 [0.5] Statistical Analysis for International Affairs	
INAF 5017 [0.25] International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25] Law and International Affairs	
<b>3. 0.5 credit in Economics</b> , successfully completed by the end of the second term, from: (See Note 1, below)	<b>0.5</b>
INAF 5009 [0.5] International Aspects of Economic Development	
INAF 5205 [0.5] Economics of Conflict	
INAF 5214 [0.5] Economics for Defence and Security	
INAF 5308 [0.5] International Trade: Theory and Policy	
INAF 5309 [0.5] International Finance: Theory and Policy	
INAF 5600 [0.5] The Economics of Human Development	
INAF 5703 [0.5] International Public Economics	
<b>4. 1.0 credit in:</b>	<b>1.0</b>
INAF 5908 [1.0] Research Essay (in the specialization)	
<b>5. 2.0 credits in Field or Elective Courses</b> (See Note 3, below)	<b>2.0</b>
6. Successful completion of second language proficiency examination (See Note 4, below)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5] Introduction to Data Science	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
INAF 5016 [0.5] Statistical Analysis for International Affairs	
INAF 5017 [0.25] International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25] Law and International Affairs	
<b>3. 0.5 credit in specialization:</b> (see Note 1, below)	<b>0.5</b>
INAF 5904 [0.5] Quantitative Research Methods	
INAF 6002 [0.5] Quantitative Research Methods	
<b>4. 0.5 credit in Economics</b> , successfully completed by the end of the second term, from: (see Note 2, below)	<b>0.5</b>
INAF 5009 [0.5] International Aspects of Economic Development	

INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>5. 2.5 credits in</b> Field or Elective courses (See Note 3, below)		<b>2.5</b>
6. Successful completion of second language proficiency examination (see Note 4, below)		
<b>Total Credits</b>		<b>5.0</b>

#### Notes:

1. The course must include at least one major assignment with a significant data science component. The selected course must be approved by the School and Institute for Data Science. An accepted data science specialization course from outside the School can be used for this requirement with approval.
2. All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309, or approved equivalent, must be completed.
3. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.
4. Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Details of the language requirement are provided on the School website.

### M.A.Sc. Digital Media with Collaborative Specialization in Data Science (5.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.5 credit from</b> core courses:		<b>1.5</b>
ITEC 5002 [0.5]	Fundamentals of Information Technology Research	
ITEC 5010 [0.5]	Applied Programming I	
ITEC 5200 [0.5]	Entertainment Technologies	
ITEC 5201 [0.5]	Computer Animation Technologies	
ITEC 5202 [0.5]	Visual Effects Technologies	
ITEC 5203 [0.5]	Game Design and Development Technologies	
ITEC 5204 [0.5]	Emerging Interaction Techniques	

ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5206 [0.5]	Data Protection and Rights Management	
ITEC 5207 [0.5]	Data Interaction Techniques	
ITEC 5208 [0.5]	Virtual Reality and 3D User Interfaces	
ITEC 5209 [0.5]	Empirical Research Methods in HCI	
ITEC 5920 [0.5]	Special Topics in Digital Media	
<b>4. 0.5 credit in</b> electives, which may include up to 0.5 credit from a 4000-level course, or a 0.5 credit graduate course from another discipline, with permission from their graduate supervisor or the Associate Director of Graduate Studies in the School.		<b>0.5</b>
<b>5. 2.5 credits in:</b>		<b>2.5</b>
ITEC 5909 [2.5]	Master's Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

**Note:** No additional IT seminar requirements for this stream.

### M.Sc. Physics

#### Medical Physics Stream with Collaborative Specialization in Data Science (5.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
PHYS 5002 [0.5]	Statistical Data Analysis Techniques for Physics (or equivalent course in computing physics)	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
PHYS 5203 [0.5]	Medical Radiation Physics	
<b>4. 0.5 credits from:</b>		<b>0.5</b>
PHYS 5204 [0.5]	Physics of Medical Imaging (for imaging)	
PHYS 5206 [0.5]	Medical Radiotherapy Physics (for therapy)	
PHYS 5207 [0.5]	Radiobiology (for biophysics)	
<b>5. 0.5 credit in</b> PHYS or PHYJ. With approval of the graduate supervisor, an appropriate graduate-level course outside the department of physics can be used.		<b>0.5</b>
<b>6. 2.5 credits in</b>		<b>2.5</b>
PHYS 5909 [2.5]	M.Sc. Thesis (on a data science topic approved by the Data Science governance committee and defended at an oral examination)	

7. Participation in the seminar series of the Ottawa-Carleton Institute for Physics

<b>Total Credits</b>		<b>5.0</b>
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### M.Sc. Physics

#### Particle Physics Stream with Collaborative Specialization in Data Science (5.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 0.5 credit in:</b>		<b>0.5</b>

PHYS 5002 [0.5]	Statistical Data Analysis Techniques for Physics (or equivalent course in computing physics)	
<b>3. 1.5 credit in:</b>		<b>1.5</b>
PHYS 5602 [0.5]	Physics of Elementary Particles	
PHYS 5701 [0.5]	Intermediate Quantum Mechanics with Applications	
PHYS 5702 [0.5]	Relativistic Quantum Mechanics	
<b>4. 2.5 credits in:</b>		<b>2.5</b>
PHYS 5909 [2.5]	M.Sc. Thesis (on a data science topic approved by the Data Science governance committee and defended at an oral examination)	
5. Participation in the seminar series of the Ottawa- Carleton Institute of Physics		
<b>Total Credits</b>		<b>5.0</b>

### M.A. Psychology with Collaborative Specialization in Data Science (5.0 credits)

Notes:

- Students must receive a minimum grade of A in each of the courses included in the Specialization.
- Courses for each research area are listed on the departmental website: [carleton.ca/psychology](http://carleton.ca/psychology).

#### Requirements:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
PSYC 5410 [0.5]	Foundations of the General Linear Model	
PSYC 5411 [0.5]	Extension of the General Linear Model	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 0.5 credit in PSYC at the 5000 level, excluding the professional development courses listed in Item 4 and excluding the elective statistics courses listed below.</b>		<b>0.5</b>
<b>4. 0.5 credit from the following professional development courses:</b>		<b>0.5</b>
PSYC 5000 [0.5]	Introduction to Program Evaluation	
PSYC 5002 [0.5]	Ethics in Psychology	
PSYC 5003 [0.5]	Open Science and Methodological Improvements	
PSYC 5004 [0.5]	Knowledge Mobilization	
PSYC 5802 [0.5]	Special Topics: Professional Development	
PSYC 5903 [0.5]	Practicum in Psychology	
<b>5. Completion of:</b>		<b>0.0</b>
PSYC 5906 [0.0]	Pro-Seminar in Psychology	
<b>6. 2.5 credits in:</b>		<b>2.5</b>
PSYC 5909 [2.5]	M.A. Thesis (in the area of Data Science, which must be defended at an oral examination)	
<b>Total Credits</b>		<b>5.0</b>

### Master of Public Policy and Administration with Collaborative Specialization in Data Science (7.0 credits)

#### Requirements - Coursework pathway:

<b>1. 4.0 credits in core courses:</b>		<b>4.0</b>
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 1.5 credits in data science core courses:</b>		<b>1.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5218 [0.5]	Analysis of Socio-economic Data	
<b>3. 0.5 credit from data science electives:</b>		<b>0.5</b>
COMP 5111 [0.5]	Data Management for Business Intelligence	
COMP 5209 [0.5]	Visual Analytics	
COMP 5305 [0.5]	Advanced Database Systems	
COMP 5306 [0.5]	Data Integration	
PADM 5372 [0.5]	Policy Seminar (Data Science Specialization)	
PADM 5391 [0.5]	Directed Studies (Data Science Specialization)	
<b>4. 1.0 credit in approved elective (see School website for details)</b>		<b>1.0</b>
<b>Total Credits</b>		<b>7.0</b>
<b>Requirements - Research essay pathway:</b>		
<b>1. 4.0 credits in core courses:</b>		<b>4.0</b>
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 1.5 credits in data science core courses:</b>		<b>1.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5218 [0.5]	Analysis of Socio-economic Data	
<b>3. 0.5 credit in approved elective (see School website for details)</b>		<b>0.5</b>
<b>4. 1.0 credit in:</b>		<b>1.0</b>

PADM 5908 [1.0]	Research Essay (on a Data Science topic approved by the MPPA Graduate Supervisor and the Data Science governance committee)	
<b>Total Credits</b>		<b>7.0</b>
<b>Master of Public Policy and Administration with Collaborative Specialization in Data Science (Advanced completion, 5.0 credits)</b>		
<b>Requirements - Coursework pathway (Advanced completion, 5.0 credits):</b>		
<b>1. 2.5 credits from</b>	<b>core courses:</b>	<b>2.5</b>
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5218 [0.5]	Analysis of Socio-economic Data	
<b>4. 0.5 credit from</b>	<b>data science electives:</b>	<b>0.5</b>
COMP 5111 [0.5]	Data Management for Business Intelligence	
COMP 5209 [0.5]	Visual Analytics	
COMP 5305 [0.5]	Advanced Database Systems	
COMP 5306 [0.5]	Data Integration	
PADM 5372 [0.5]	Policy Seminar (Data Science Specialization)	
PADM 5391 [0.5]	Directed Studies (Data Science Specialization)	
<b>5. 1.0 credit in</b>	<b>approved elective (see School website for details)</b>	<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (Advanced completion, 5.0 credits):</b>		
<b>1. 2.5 credits from</b>	<b>core courses:</b>	<b>2.5</b>
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	

<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5218 [0.5]	Analysis of Socio-economic Data	
<b>4. 0.5 credit in</b>	<b>approved elective (see School website for details)</b>	<b>0.5</b>
<b>5. 1.0 credit in:</b>		<b>1.0</b>
PADM 5908 [1.0]	Research Essay (on a Data Science topic approved by the MPPA Graduate Supervisor and the Data Science governance committee)	
<b>Total Credits</b>		<b>5.0</b>

## **M.A. Sociology with Collaborative Specialization in Data Science (5.0 credits)**

### **Requirements - Thesis pathway (5.0 credits):**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
SOCI 5102 [0.5]	Multiple Regression Analysis	
SOCI 5104 [0.5]	Advanced Multivariate Analysis	
<b>4. 0.5 credit in</b>	<b>SOCI at the graduate level (not including those listed above). May be selected from courses at the 4000-level, with department permission.</b>	<b>0.5</b>
<b>5. 2.0 credits in:</b>		<b>2.0</b>
SOCI 5909 [2.0]	M.A. Thesis (in the specialization)	
6.0 An oral examination on the candidate's thesis and program		
<b>Total Credits</b>		<b>5.0</b>

### **Requirements – Research Essay pathway (5.0 credits):**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
SOCI 5102 [0.5]	Multiple Regression Analysis	
SOCI 5104 [0.5]	Advanced Multivariate Analysis	
<b>4. 1.5 credits in</b>	<b>SOCI at the graduate level (not including those listed above). With department permission 0.5 credit may be selected from courses at the 4000-level.</b>	<b>1.5</b>
<b>5. 1.0 credit in:</b>		<b>1.0</b>
SOCI 5908 [1.0]	M.A. Research Essay (in the specialization)	
6. An oral examination on the candidate's research essay and program		
<b>Total Credits</b>		<b>5.0</b>

## Regulations

See the General Regulations section of this Calendar, as well as regulations pertaining to the specific collaborative programs offering the data science specialization.

## Admission

Students who are enrolled in a master's program in one of the participating units may apply to the Data Science governance committee for admission to the Collaborative Program. Admission to the program is determined by the governance committee and will normally take place before the end of October the year of admittance in one of the participating master's programs.

Admission requirements to the Collaborative Master's with Specialization in Data Science are:

- Registration in the master's program of one of the participating units
- Approval of a student's program of study by the Data Science governance committee and the student's home department. Students in a thesis program will be expected to choose a thesis topic that is directly related to Data Science. Students in an approved course work program will be required to take some elective courses in designated or approved courses with significant Data Science content.

## Data Science, Analytics, and Artificial Intelligence

This section presents the requirements for programs in:

- **M.A.Sc. Data Science, Analytics, and Artificial Intelligence**
- **M.C.S. Data Science, Analytics, and Artificial Intelligence**
- **M.Eng. Data Science, Analytics, and Artificial Intelligence**
- **M.I.T. Data Science, Analytics, and Artificial Intelligence**
- **M.Sc. Data Science, Analytics, and Artificial Intelligence**
- **Ph.D. Data Science, Analytics, and Artificial Intelligence**

### M.A.Sc. Data Science, Analytics, and Artificial Intelligence (5.0 credits)

#### M.A.Sc. Data Science, Analytics, and Artificial Intelligence - thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
DATA 5000 [0.5]	Introduction to Data Science
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics
<b>2. 0.5 credit in approved SYSC electives (see DSAAI program website for list of applicable electives)</b>	<b>0.5</b>
<b>3. 0.5 credit in approved electives not in SYSC (see DSAAI program website for list of applicable electives)</b>	<b>0.5</b>
<b>4. 0.5 credit in elective from any participating DSAAI unit</b>	<b>0.5</b>
<b>Note: 0.5 credit from above electives must be in applications of artificial intelligence or machine learning (see DSAAI program website for list of applicable electives)</b>	
<b>5. 2.5 credits in:</b>	<b>2.5</b>
DATA 5929 [2.5]	Thesis - MASC
<b>Total Credits</b>	<b>5.0</b>

### M.C.S. Data Science, Analytics, and Artificial Intelligence (5.0 credits)

#### Requirements - thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
DATA 5000 [0.5]	Introduction to Data Science
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics
<b>2. 0.5 credit in approved COMP electives (see DSAAI program website for list of applicable electives)</b>	<b>0.5</b>
<b>3. 0.5 credit in approved electives not in COMP (see DSAAI program website for list of applicable electives)</b>	<b>0.5</b>
<b>4. 0.5 credit in elective from any participating DSAAI unit</b>	<b>0.5</b>
<b>5. 0.5 credit from above electives must be in applications of artificial intelligence or machine learning (See DSAAI program website for list)</b>	
<b>6. 2.5 credits in:</b>	<b>2.5</b>
DATA 5939 [2.5]	Thesis - MCS
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
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DATA 5000 [0.5]	Introduction to Data Science	
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 2.0 credits in</b>	approved COMP electives (see DSAAI program website for list of applicable electives)	2.0
<b>3. 1.0 credit in</b>	approved electives from two units not in COMP (see DSAAI program website for list of applicable electives)	1.0
<b>4. 1.0 credit in</b>	electives from any participating DSAAI unit	1.0
<b>Note: 0.5 credit from the above electives must be in applications of artificial intelligence or machine learning (see DSAAI program website for list)</b>		
<b>Total Credits</b>		<b>5.0</b>

### M.Eng. Data Science, Analytics, and Artificial Intelligence (4.5 credits)

#### M.Eng. Data Science, Analytics, and Artificial Intelligence - coursework pathway (4.5 credits)

<b>1. 1.0 credit in:</b>		1.0
DATA 5000 [0.5]	Introduction to Data Science	
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 1.0 credit in</b>	approved SYSC electives (see DSAAI program website for list of applicable electives)	1.0
<b>3. 0.5 credit in</b>	any graduate-level SYSC course	0.5
<b>4. 1.0 credit in</b>	approved electives from two units not in SYSC (see DSAAI program website for list of applicable electives)	1.0
<b>5. 1.0 credit in</b>	electives from any participating DSAAI unit	1.0
<b>Note: 0.5 credit from above electives must be in application of artificial intelligence or machine learning (see DSAAI program website for list of applicable electives)</b>		
<b>Total Credits</b>		<b>4.5</b>

#### M.Eng. Data Science, Analytics, and Artificial Intelligence - project pathway (4.5 credits)

<b>1. 1.0 credit in:</b>		1.0
DATA 5000 [0.5]	Introduction to Data Science	
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 1.0 credit in</b>	approved SYSC electives (see DSAAI program website for list of applicable electives)	1.0
<b>3. 1.0 credit in</b>	approved electives from two units not in SYSC (see DSAAI program website for list of applicable electives)	1.0
<b>4. 0.5 credit in</b>	elective from any participating DSAAI unit	0.5
<b>Note: 0.5 credit from above electives must be in applications of artificial intelligence and machine learning (see DSAAI program website for list of applicable electives)</b>		
<b>5. 1.0 credit in:</b>		1.0
DATA 5928 [1.0]	Project - MEng	
<b>Total Credits</b>		<b>4.5</b>

### M.I.T. Data Science, Analytics, and Artificial Intelligence (5.0 credits)

#### M.I.T. Data Science, Analytics, and Artificial Intelligence - thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		1.0
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DATA 5000 [0.5]	Introduction to Data Science	
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 0.5 credit in</b>	approved ITEC electives (see DSAAI program website for list of applicable electives)	0.5
<b>3. 0.5 credit in</b>	approved electives not in ITEC (see DSAAI program website for list of applicable electives)	0.5
<b>4. 0.5 credit in</b>	elective from any participating DSAAI unit	0.5
<b>Note: 0.5 credit from above electives must be in applications of artificial intelligence or machine learning (see DSAAI program website for list of applicable electives)</b>		
<b>5. 2.5 credits in:</b>		2.5
DATA 5919 [2.5]	Thesis - MIT	
<b>Total Credits</b>		<b>5.0</b>

#### M.I.T. Data Science, Analytics, and Artificial Intelligence - project pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		1.0
DATA 5000 [0.5]	Introduction to Data Science	
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 1.0 credit in</b>	approved ITEC electives (see DSAAI program website for list of applicable electives)	1.0
<b>3. 1.0 credit in</b>	approved electives from two units not in ITEC (see DSAAI program website for list of applicable electives)	1.0
<b>4. 0.5 credit in</b>	elective from any participating DSAAI unit	0.5
<b>Note: 0.5 credit from above electives must be in applications of artificial intelligence or machine learning (see DSAAI program website for list of applicable electives)</b>		
<b>5. 1.5 credits in:</b>		1.5
DATA 5918 [1.5]	Project - MIT	
<b>Total Credits</b>		<b>5.0</b>

#### M.I.T. Data Science, Analytics, and Artificial Intelligence - coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		1.0
DATA 5000 [0.5]	Introduction to Data Science	
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 2.0 credits in</b>	approved ITEC electives (see DSAAI program website for list of applicable electives)	2.0
<b>3. 1.0 credit in</b>	approved electives from two units not in ITEC (see DSAAI program website for list of applicable electives)	1.0
<b>4. 1.0 credit in</b>	electives from any participating DSAAI unit	1.0
<b>Note: 0.5 credit from above electives must be in applications of artificial intelligence or machine learning (see DSAAI program website for list of applicable electives)</b>		
<b>Total Credits</b>		<b>5.0</b>

### M.Sc. Data Science, Analytics, and Artificial Intelligence (5.0 credits)

#### M.Sc. Data Science, Analytics and Artificial Intelligence - thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		1.0
DATA 5000 [0.5]	Introduction to Data Science	

DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 0.5 credit in</b> approved MATH or STAT elective (see DSAAI program website for list of applicable electives)		0.5
<b>3. 0.5 credit in</b> approved electives not in MATH or STAT (see DSAAI program website for list of applicable electives)		0.5
<b>4. 0.5 credit in</b> elective from any participating DSAAI unit		0.5
<b>Note: 0.5 credit from above electives must be in applications of artificial intelligence or machine learning (see DSAAI program website for list of applicable electives)</b>		
<b>5. 2.5 credits in:</b>		2.5
DATA 5909 [2.5]	Thesis - MSc	
<b>Total Credits</b>		<b>5.0</b>

#### **M.Sc. Data Science, Analytics, and Artificial Intelligence - project pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>		1.0
DATA 5000 [0.5]	Introduction to Data Science	
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 1.0 credit in</b> approved MATH or STAT electives (see DSAAI program website for list of applicable electives)		1.0
<b>3. 1.0 credit in</b> approved electives from two units not in MATH OR STAT (see DSAAI program website for list of applicable electives)		1.0
<b>4. 0.5 credit in</b> elective from any participating DSAAI unit		0.5
<b>Note: 0.5 credit from above electives must be in applications of artificial intelligence or machine learning (see DSAAI program website for list of applicable electives)</b>		
<b>5. 1.5 credits in:</b>		1.5
DATA 5908 [1.5]	Project - MSc	
<b>Total Credits</b>		<b>5.0</b>

#### **M.Sc. Data Science, Analytics and Artificial Intelligence - coursework pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>		1.0
DATA 5000 [0.5]	Introduction to Data Science	
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 2.0 credits in</b> approved MATH OR STAT electives (see DSAAI program website for list of applicable electives)		2.0
<b>3. 1.0 credit in</b> approved electives from two units not in MATH OR STAT (see DSAAI program website for list of applicable electives)		1.0
<b>4. 1.0 credit in</b> elective from any participating DSAAI unit		1.0
<b>Note: 0.5 credit from above electives must be in applications of artificial intelligence or machine learning (see DSAAI program website for list of applicable electives)</b>		
<b>Total Credits</b>		<b>5.0</b>

#### **Ph.D. Data Science, Analytics, and Artificial Intelligence (1.5 credits)**

##### **Requirements (1.5 credits):**

<b>1. 0.5 credit in:</b>		0.5
DATA 5001 [0.5]	Fundamentals in Data Science and Analytics	
<b>2. 1.0 credit in</b> elective, approved by supervisor (see DSAAI program website for list of applicable electives)		1.0

##### **3. 0.0 credit in:**

DATA 6907 [0.0]	Doctoral Comprehensive	
<b>4. 0.0 credit in:</b>		
DATA 6908 [0.0]	Doctoral Proposal	
<b>5. 0.0 credit in:</b>		0.0
DATA 6909 [0.0]	Thesis - PhD	

**Total Credits** **1.5**

## **Regulations**

See the General Regulations section of this Calendar.

### **Regularly Scheduled Break**

For immigration purposes, the summer term (May to August) for master's programs in Data Science, Analytics, and Artificial Intelligence is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## **Admission**

### **M.A.Sc.**

The normal requirement for admission to the M.A.Sc. Data Science, Analytics, and Artificial Intelligence is a bachelor's degree in electrical engineering, software engineering, computer systems engineering, or a related discipline with an average of at least B+.

### **M.C.S.**

The normal requirement for admission to the M.C.S. Data Science, Analytics and Artificial Intelligence is an honours bachelor's degree in computer science or equivalent with an average of at least B+. An equivalent degree would include at least twelve computer science half-credits, two of which must be at the 4000-level, and eight half-credits in mathematics, one of which must be at the 3000- or 4000-level.

### **M.Eng.**

The normal requirement for admission to the M.Eng. Data Science and Analytics is a bachelor's degree in electrical engineering, software engineering, computer systems engineering, or a related discipline with an average of at least B+.

### **M.I.T.**

The normal requirement for admission to the M.I.T. Data Science, Analytics, and Artificial Intelligence is an undergraduate degree in information technology, computer science, computer systems engineering, electrical engineering, arts, humanities, psychology, communication, and business, or a related discipline with an average of at least B+. Intermediate programming and data science (statistics, data analysis, or related) courses are expected.

### **M.Sc.**

The normal requirement for admission to the M.Sc. Data Science, Analytics, and Artificial Intelligence is an honours bachelor's degree in mathematics, statistics or

the equivalent, with an average of B+ or higher in the honours subject and B- or higher overall.

### **Admission (Ph.D.)**

See the General Regulations section of this Calendar for detailed admission requirements. The normal requirement for admission to the DSAAI Ph.D. program is a master's degree in data science or in a discipline relevant to the home unit of the supervisor, or the equivalent, including demonstrated significant research ability, with at least B+ standing.

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

### **Application Requirements**

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

### **Participation Requirements**

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.
- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

### **Co-op Participation Agreement**

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

### **Communication with the Co-op Office**

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

### **Graduation with the Co-op Designation**

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two

work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

### **Employment**

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

### **Work Term Assessment and Evaluation**

#### **Work Term Evaluation**

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

#### **Work Term Assessment**

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

#### **Voluntary Withdrawal from the Co-op Option**

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

#### **Involuntary or Required Withdrawal from the Co-op Option**

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### **International Students**

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to**

accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.

#### **Co-op Fees**

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

#### **Data Science, Analytics, and Artificial Intelligence Co-operative Education Option**

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the M.A.S.c., M.C.S., M.Eng., M.I.T., or M.Sc. in Data Science, Analytics, and Artificial Intelligence;
2. have completed, by the start-date of the first work term, DATA 5000 and/or DATA 5001;
3. have achieved, by the start-date of the first work term, a minimum grade of A- in at least four 5000-level courses;
4. be registered as a full-time student in each academic term prior to a work term;
5. be eligible to work in Canada (for off-campus work terms).

For more information, please refer to the Co-operative Education Policy.

#### **Data Science (DATA) Courses**

##### **DATA 5000 [0.5 credit]**

##### **Introduction to Data Science**

Machine learning; statistics; data science; data ethics; data cleaning; data preparation; data visualization; communication skills to explain advanced analytics. Students work on an interdisciplinary project in data science.

##### **DATA 5001 [0.5 credit]**

##### **Fundamentals in Data Science and Analytics**

Ethics in Data Science and Analytics, visualization and knowledge discovery in massive datasets; unsupervised learning: clustering algorithms; dimension reduction; supervised learning: pattern recognition, smoothing techniques, classification.

Precludes additional credit for STAT 5703.

##### **DATA 5002 [0.5 credit]**

##### **Data Science, Ethics & Society**

The ethical, social, political, and environmental implications of data science including the roles and responsibilities of data scientists in contemporary and emerging technological systems and the impact these systems may have at multiple scales, individual, group, institution, across sectors and nation-states.

Includes: Experiential Learning Activity

Also listed as COMS 5225.

Precludes additional credit for COMS 5225, ITEC 5206.

##### **DATA 5900 [0.5 credit]**

##### **Special Topics in Data Science**

Special topics, not covered by other graduate courses.

Details will be available at the time of registration.

##### **DATA 5901 [0.5 credit]**

##### **Directed Studies in DSAAI (Master's)**

A course of independent study under the supervision of a faculty member in the Data Science, Analytics, and Artificial Intelligence program.

##### **DATA 5908 [1.5 credit]**

##### **Project - MSc**

##### **DATA 5909 [2.5 credits]**

##### **Thesis - MSc**

##### **DATA 5913 [0.0 credit]**

##### **Co-operative Work Term**

Includes: Experiential Learning Activity

Prerequisite(s): registration in the Co-operative Education Option in the Data Science, Analytics, and Artificial Intelligence program.

##### **DATA 5918 [1.5 credit]**

##### **Project - MIT**

##### **DATA 5919 [2.5 credits]**

##### **Thesis - MIT**

##### **DATA 5928 [1.0 credit]**

##### **Project - MEng**

##### **DATA 5929 [2.5 credits]**

##### **Thesis - MASc**

##### **DATA 5939 [2.5 credits]**

##### **Thesis - MCS**

**DATA 6901 [0.5 credit]**  
**Directed Studies in DSAAI (PhD)**

A course of independent study under the supervision of a faculty member in the Data Science, Analytics, and Artificial Intelligence program.

**DATA 6907 [0.0 credit]**  
**Doctoral Comprehensive**

Serves as starting point for the PhD literature survey and selection of a research topic. Student submits a document focusing on the problem statement, literature review, and gap analysis for the comprehensive exam. The student defends their submission in an oral exam.

**DATA 6908 [0.0 credit]**  
**Doctoral Proposal**

Written proposal outlines a specific problem, connects it to current literature, and presents the hypothesis and goals. Summarizes preliminary results and details the research methodology and validation procedures(s). Proposal is defended in an oral exam, highlighting completed work and what is expected in final dissertation.

**DATA 6909 [0.0 credit]**  
**Thesis - PhD**

## Design

This section presents the requirements for programs in:

- **Master of Design**
- **Master of Design with Collaborative Specialization in Accessibility**

### Program Requirements

#### Master of Design (5.0 credits)

The program may be completed over two years. Consult the School regarding registration sequence.

**Requirements:**

<b>1. 1.5 credits in:</b>	<b>1.5</b>
IDES 5101 [0.5]	Interdisciplinary Design Development Seminar
IDES 5102 [0.5]	Design Research Methods
IDES 5103 [0.5]	Interdisciplinary Design Development Studio
<b>2. 1.5 credits in</b> elective courses, chosen in consultation with the Graduate Program Coordinator. A minimum of 1.0 credit should be selected from outside the MDes program, 0.5 credit may be in Directed Study. Exceptions subject to approval. 4.5 credits of the credits presented for this degree must be at the 5000-level or higher.	<b>1.5</b>
<b>4. 2.0 credits in:</b>	<b>2.0</b>
IDES 5909 [2.0]	Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

#### Master of Design with Collaborative Specialization in Accessibility (5.0 credits)

**Requirements:**

<b>1. 1.5 credits in:</b>	<b>1.5</b>
IDES 5101 [0.5]	Interdisciplinary Design Development Seminar
IDES 5102 [0.5]	Design Research Methods
IDES 5103 [0.5]	Interdisciplinary Design Development Studio
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>3. 0.5 credit in</b> elective course	<b>0.5</b>
<b>4. 2.0 credits in:</b>	<b>2.0</b>
IDES 5909 [2.0]	Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

### Regulations

See the General Regulations section of this Calendar.

Industrial Design does not permit the C+ option as stipulated in Section 11.2 of the General Regulations.

### Admission

The University's general requirements for admission are outlined in Section 2.1 of the General Regulations in the Graduate Calendar.

Applicants must have successfully completed a bachelor's degree in a design discipline, or the equivalent, with B+ or higher overall.

Applicants with a design-related background, but not a degree in design, will be required to demonstrate significant links between their academic background and professional experience in the design development process.

In addition to these academic credentials, applicants must submit the following materials to the School of Industrial Design:

- Application Form
- Statement of Intent (one page)

The quality of the statement of intent is critical to the likelihood of an applicant's admission. The writing should be succinct and as carefully considered as the content of the statement, which should address at least the four following areas:

- What is the area of intended research with specific reference to the program courses and the expertise of the faculty members
- How the applicant's academic background and professional experience relates to the program with reference to any previous research, scholarship, or project experience with interdisciplinary or collaborative teams
- How the intended research program will align with the objectives of the program relating to: design research, interdisciplinary design development, strategic design planning, knowledge creation and dissemination
- An explanation of the specific reasons for choosing the School of Industrial Design at Carleton University

### **Portfolio**

The portfolio should provide the best examples of creative intellectual activity and recent professional work that indicates the applicant is sufficiently prepared to pursue studies in the program. These activities may be represented by proposals, reports, and/or analysis documents. Emphasis should be placed on evidence of understanding the communication of design ideas in visual form.

The presentation of the portfolio should be professional and facilitate the review process of the content, and should be submitted in prescribed format.

### **Two Letters of Recommendation**

Applicants must provide two (2) confidential letters of reference appended to prescribed recommendation forms.

### **Language Proficiency**

Proficiency in English is necessary to pursue graduate studies at Carleton University. All applicants are required to meet the requirements set out in Section 3.6 of the General Regulations of this Calendar.

### **Qualifying Year Program**

Candidates with admission deficiencies would be required to successfully complete additional prescribed courses to qualify for admission. Applicants without a degree in

design may be required to register for up to 2.0 credits of courses selected from the undergraduate Bachelor of Industrial Design program, in consultation with the Graduate Program Coordinator.

All courses must be approved by the Graduate Program Coordinator of the School in consultation with Graduate Studies. (See General Regulations Section 2.3, "Completion of the Qualifying Year", for more details.) Completion of the Qualifying Year is not a guarantee of admission to the Master of Design. Re-application to the M.Des. program is required.

### **Accelerated Pathway**

The accelerated pathway in Industrial Design is a flexible and individualized plan of graduate study for students in the final year of the Bachelor of Industrial Design.

Students in their third-year of study in the Bachelor of Industrial Design should consult with both the Director and the Graduate Program Coordinator to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses.

### **Accelerated Pathway Requirements**

1. A maximum of 1.0 credits with 5000-level courses.
2. Minimal overall CGPA of B+

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### **Industrial Design (IDES) Courses**

#### **IDES 5000 [0.5 credit]**

#### **Directed Studies in Industrial Design**

Reading and research tutorials.

Includes: Experiential Learning Activity

#### **IDES 5101 [0.5 credit]**

#### **Interdisciplinary Design Development Seminar**

Investigation of interdisciplinary design discourse about disciplines, themes, and concepts involved in design development. Examines a range of different professional perspectives and methods for integrating collaborative practices affected by leadership, negotiation, conflict management, and team building. Introduction to graduate academic writing.

Includes: Experiential Learning Activity

#### **IDES 5102 [0.5 credit]**

#### **Design Research Methods**

Critical review of qualitative and quantitative research methods to support interdisciplinary design. Methods used by collaborators from the sciences and humanities as well as methods designers bring to interdisciplinary collaborations are introduced. Research for design, research through design and theoretical frameworks are discussed.

Includes: Experiential Learning Activity

Also listed as HCIN 5404.

**IDES 5103 [0.5 credit]****Interdisciplinary Design Development Studio**

Team-based studio projects draw on interdisciplinary design development methods in achieving a common design objective. Projects will be supervised by academic and industry advisors from a wide range of disciplines, and conducted in collaboration with professionals from external organizations. Open to students from other programs.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 5101 and IDES 5102 or permission of the School of Industrial Design.

**IDES 5104 [0.5 credit]****Accessibility and Inclusive Design Seminar**

Provides foundational knowledge, exploring interdisciplinary approaches for incorporating accessible, inclusive, and human-centered design principles into the research, design, and development of products, information, and environments that can be used by all people, regardless of ability.

Includes: Experiential Learning Activity

Also listed as ACCS 5002.

**IDES 5500 [0.5 credit]****Special Topics in Industrial Design**

Seminar course in contemporary design issues of an interdisciplinary nature. Guided by a faculty member and supported by external professionals.

Includes: Experiential Learning Activity

**IDES 5909 [2.0 credits]****Thesis**

A comprehensive project that demonstrates the student's ability to conduct critical research in a specific area in which design can contribute to competitive advantage through design planning and interdisciplinary design development processes.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 5101, IDES 5102, and IDES 5103.

## Digital Humanities (Collaborative Specialization)

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This section presents the requirements for programs in:

- **M.A. Anthropology with Collaborative Specialization in Digital Humanities**
- **M.A. Applied Linguistics with Collaborative Specialization in Digital Humanities**
- **M.A. Art and Architectural History with Collaborative Specialization in Digital Humanities**
- **M.A. Canadian Studies with Collaborative Specialization in Digital Humanities**
- **M.A. English with Collaborative Specialization in Digital Humanities**
- **M.A. Film Studies with Collaborative Specialization in Digital Humanities**
- **M.A. History with Collaborative Specialization in Digital Humanities**
- **M.A. Music and Culture with Collaborative Specialization in Digital Humanities**
- **M.A. Philosophy with Collaborative Specialization in Digital Humanities**
- **M.A. Public History with Collaborative Specialization in Digital Humanities**
- **M.A. Sociology with Collaborative Specialization in Digital Humanities**
- **Master of Cognitive Science with Collaborative Specialization in Digital Humanities**

**Program Requirements**

### M.A. Anthropology with Collaborative Specialization in Digital Humanities (5.0 credits)

**Requirements - Thesis pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5401 [0.5] Theory in Anthropology	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5402 [0.5] Research in Anthropology	
<b>3. 1.0 credit in electives</b>	<b>1.0</b>
<b>4. 2.0 credits in:</b>	<b>2.0</b>
ANTH 5909 [2.0] M.A. Thesis (in the specialization)	
<b>5. 0.5 credit in:</b>	<b>0.5</b>
DIGH 5000 [0.5] Issues in the Digital Humanities	
<b>6. 0.5 credit in DIGH (DIGH 5011, DIGH 5012, or annually-listed DIGH course)</b>	<b>0.5</b>
<b>7. 0.0 credit in:</b>	<b>0.0</b>
DIGH 5800 [0.0] Digital Humanities: Professional Development	

<b>Total Credits</b>	<b>5.0</b>
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**Requirements - Research essay pathway:**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5401 [0.5] Theory in Anthropology (normally to be taken in the first fall term after admission to the program)	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
ANTH 5402 [0.5] Research in Anthropology	

<b>3. 2.0 credits in</b> electives	2.0
<b>4. 1.0 credit in:</b>	1.0
ANTH 5908 [1.0]    M.A. Research Essay (in the specialization)	
<b>5. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]    Issues in the Digital Humanities	
<b>6. 0.5 credit in</b> DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5
<b>7. 0.0 credit in</b> DIGH 5800	0.0
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
ANTH 5401 [0.5]    Theory in Anthropology (normally to be taken in the first fall term after admission to the program)	
<b>2. 0.5 credit in:</b>	0.5
ANTH 5402 [0.5]    Research in Anthropology	
<b>3. 2.5 credits in</b> electives	2.5
<b>4. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]    Issues in the Digital Humanities	
<b>5. 0.5 credit in</b> DIGH (DIGH 5011, DIGH 5012, or annually-listed DIGH course)	0.5
<b>6. 0.5 credit in</b> 5000-level ANTH course with a digital humanities focus	0.5
<b>7. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]    Digital Humanities: Professional Development	
<b>Total Credits</b>	<b>5.0</b>

### M.A. Applied Linguistics with Collaborative Specialization in Digital Humanities (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
ALDS 5001 [0.5]    Directions in Applied Linguistics and Discourse Studies	
ALDS 5002 [0.5]    Inquiry Strategies in Applied Linguistics and Discourse Studies	
<b>2. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]    Issues in the Digital Humanities	
<b>3. 0.5 credit in</b> DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5
<b>4. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]    Digital Humanities: Professional Development	
<b>5. 1.0 credit from</b> any 5000-level ALDS course	1.0
<b>6. 2.0 credits in:</b>	2.0
ALDS 5909 [2.0]    M.A. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research Essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
ALDS 5001 [0.5]    Directions in Applied Linguistics and Discourse Studies	
ALDS 5002 [0.5]    Inquiry Strategies in Applied Linguistics and Discourse Studies	
<b>2. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]    Issues in the Digital Humanities	
<b>3. 0.5 credit in</b> DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5

<b>4. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]    Digital Humanities: Professional Development	
<b>5. 2.0 credits from</b> any 5000-level ALDS course	2.0
<b>6. 1.0 credit in:</b>	1.0
ALDS 5908 [1.0]    Research Essay (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
ALDS 5001 [0.5]    Directions in Applied Linguistics and Discourse Studies	
ALDS 5002 [0.5]    Inquiry Strategies in Applied Linguistics and Discourse Studies	
<b>2. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]    Issues in the Digital Humanities	
<b>3. 0.5 credit in</b> DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5
<b>4. 0.5 credit in</b> 5000-level ALDS with Digital Humanities focus or a DIGH course, chosen in consultation with the SLALS graduate supervisor	0.5
<b>5. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]    Digital Humanities: Professional Development	
<b>6. 2.5 credits from</b> any 5000-level ALDS course	2.5
<b>Total Credits</b>	<b>5.0</b>

### M.A. Art and Architectural History with Collaborative Specialization in Digital Humanities (4.5 credits)

#### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>	1.0
ARTH 5010 [1.0]    Theory and Practice of Art and Architectural History	
<b>2. 0.5 credit in</b> ARTH, which can include ARTH 5011	0.5
<b>3. 0.5 credit in:</b>	0.5
ARTH 5011 [0.5]    Graduate Practicum	
<b>4. 0.0 credit in:</b>	0.0
ARTH 5800 [0.0]    Carleton Art Forum	
<b>5. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]    Issues in the Digital Humanities	
<b>6. 0.5 credit in</b> Digital Humanities (DIGH 5011, DIGH 5012, or annually listed Digital Humanities Course)	0.5
<b>7. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]    Digital Humanities: Professional Development	
<b>8. 1.5 credit in:</b>	1.5
ARTH 5909 [1.5]    M. A. Thesis	
<b>9. Language Requirement:</b>	
Students are required to demonstrate knowledge of a second language.	
<b>Total Credits</b>	<b>4.5</b>

#### Requirements - Major Research Project pathway:

<b>1. 1.0 credit in:</b>	1.0
ARTH 5010 [1.0]    Theory and Practice of Art and Architectural History	
<b>2. 1.0 credits in</b> ARTH graduate coursework, 0.5 credits of which can include ARTH 5011.	1.0

<b>3. 0.5 credits in:</b>	0.5
ARTH 5011 [0.5] Graduate Practicum	
<b>4. 0.0 credit in:</b>	0.0
ARTH 5800 [0.0] Carleton Art Forum	
<b>5. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5] Issues in the Digital Humanities	
<b>6. 0.5 credit in</b> Digital Humanities (DIGH 5011, DIGH 5012, or annually listed Digital Humanities course)	0.5
<b>7. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0] Digital Humanities: Professional Development	
<b>8. 1.0 credit in:</b>	1.0
ARTH 5908 [1.0] Major Research Project	
<b>9. Language Requirement:</b>	
Students are required to demonstrate knowledge of a second language.	
<b>Total Credits</b>	<b>4.5</b>
<b>Requirements - Coursework pathway:</b>	
<b>1. 1.0 credit in:</b>	1.0
ARTH 5010 [1.0] Theory and Practice of Art and Architectural History	
<b>2. 2.0 credits in</b> ARTH, 0.5 credits of which can include ARTH 5011.	2.0
<b>3. 0.5 credit in:</b>	0.5
ARTH 5011 [0.5] Graduate Practicum (with a Digital Humanities focus)	
<b>4. 0.0 credit in:</b>	0.0
ARTH 5800 [0.0] Carleton Art Forum	
<b>5. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5] Issues in the Digital Humanities	
<b>6. 0.5 credit in</b> Digital Humanities (DIGH 5011, DIGH 5012, or annually listed Digital Humanities course)	0.5
<b>7. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0] Digital Humanities: Professional Development	
<b>8. Language Requirement:</b>	
Students are required to demonstrate knowledge of a second language.	
<b>Total Credits</b>	<b>4.5</b>

### M.A. Canadian Studies with Collaborative Specialization in Digital Humanities (5.0 credits)

#### Requirements - coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
CDNS 5001 [0.5] M.A. Core Seminar: Conceptualizing Canada	
DIGH 5000 [0.5] Issues in the Digital Humanities	
DIGH 5800 [0.0] Digital Humanities: Professional Development	
<b>2. 1.0 credit in</b> approved Digital Humanities elective courses.	1.0
<b>3. 3.0 credits in</b> approved elective courses, Internship/Practicum, or Directed Studies.	3.0
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - research essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
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CDNS 5908 [1.0] Research Essay (in the specialization)	
<b>2. 0.5 credit in:</b>	0.5
CDNS 5001 [0.5] M.A. Core Seminar: Conceptualizing Canada	
<b>3. 0.5 credit from:</b>	0.5
DIGH 5000 [0.5] Issues in the Digital Humanities	
DIGH 5800 [0.0] Digital Humanities: Professional Development	
<b>4. 1.0 credit in</b> approved Digital Humanities elective courses.	1.0
<b>5. 2.0 credits in</b> approved elective courses, Internship/Practicum, or Directed Studies.	2.0
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - thesis pathway (5.0 credits)

<b>1. 2.0 credits in:</b>	2.0
CDNS 5909 [2.0] M.A. Thesis (in the specialization)	
<b>2. 0.5 credit in:</b>	0.5
CDNS 5001 [0.5] M.A. Core Seminar: Conceptualizing Canada	
<b>3. 0.5 credit from:</b>	0.5
DIGH 5000 [0.5] Issues in the Digital Humanities	
DIGH 5800 [0.0] Digital Humanities: Professional Development	
<b>4. 1.0 credit in</b> approved Digital Humanities elective courses.	1.0
<b>5. 1.0 credit in</b> approved elective courses, Internship/Practicum, or Directed Studies.	1.0
<b>Total Credits</b>	<b>5.0</b>

### Thesis/Research Essay Proposal

At the time of declaring their option, thesis/research essay students are encouraged to declare a preliminary topic and tentative list of potential supervisors. Thesis/research essay students must submit a research proposal to the School that has been approved by their thesis/research essay supervisor prior to registering in CDNS 5908 or CDNS 5909.

### M.A. English with Collaborative Specialization in Digital Humanities (4.5 credits)

#### Requirements - Coursework pathway (4.5 credits)

<b>1. 2.5 credits in</b> 5000-level ENGL (excluding ENGL 5908 and ENGL 5909)	2.5
<b>2. 0.5 credit in:</b>	0.5
ENGL 5005 [0.5] M.A. Seminar	
<b>3. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5] Issues in the Digital Humanities	
<b>3. 1.0 credit in</b> DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	1.0
<b>4. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0] Digital Humanities: Professional Development	
<b>Total Credits</b>	<b>4.5</b>

#### Requirements - Research essay pathway (4.5 credits)

<b>1. 2.0 credits in</b> ENGL at the 5000 level (excluding ENGL 5909)	2.0
<b>2. 0.5 credit in:</b>	0.5

ENGL 5005 [0.5]	M.A. Seminar	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
ENGL 5908 [1.0]	Research Essay (in the specialization)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed Digital Humanities course)	<b>0.5</b>
<b>6. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>4.5</b>

#### Requirements - Thesis pathway (4.5 credits)

<b>1. 1.0 credit in</b>	ENGL at the 5000 level (excluding ENGL 5908)	<b>1.0</b>
<b>2. 0.5 credit in:</b>		<b>0.5</b>
ENGL 5005 [0.5]	M.A. Seminar	
<b>3. 2.0 credits in:</b>		<b>2.0</b>
ENGL 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit from:</b>		<b>0.5</b>
DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities	
DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities	
	- or annually listed DIGH course	
<b>6. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>4.5</b>

### M.A. Film Studies with Collaborative Specialization in Digital Humanities (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	
<b>2. 1.5 credits in</b>	Film Studies graduate course work, excluding FILM 5801	<b>1.5</b>
<b>3. 1.5 credits in:</b>		<b>1.5</b>
FILM 5909 [1.5]	M.A. Thesis (in the specialization)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually-listed DIGH course)	<b>0.5</b>
<b>6. 0.0 credit in</b>	DIGH 5800	<b>0.0</b>
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	

**2. 2.0 credits in** Film Studies graduate course work, 0.5 credit of which can include:

FILM 5801 [0.5]	Graduate Internship	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
FILM 5908 [1.0]	Research Essay (in the specialization)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	<b>0.5</b>
<b>6. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>5.0</b>

**Note:** for **Item 2** above, students may take 0.5 credit of coursework outside the Film Studies program subject to the approval of the Graduate Supervisor. This credit may be a 4000-level Film Studies course.

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	
<b>2. 2.5 credits in</b>	Film Studies graduate course work, 0.5 credit of which can include:	<b>2.5</b>
FILM 5801 [0.5]	Graduate Internship	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>4. 1.0 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	<b>1.0</b>
<b>5. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>5.0</b>

**Note:** for **Item 2** above, students may take a 0.5 credit Film Studies course at the 4000-level subject to the approval of the Graduate Supervisor.

### M.A. History with Collaborative Specialization in Digital Humanities (4.5 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
HIST 5003 [0.5]	Historical Theory and Method	
<b>2. 1.0 credit in</b>	HIST at the graduate level at Carleton; up to 0.5 credit may be taken in a designated public history course; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	<b>1.0</b>
<b>3. 2.0 credits in:</b>		<b>2.0</b>
HIST 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	<b>0.5</b>
<b>6. 0.0 credit in:</b>		<b>0.0</b>

DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>4.5</b>
<b>M.A. Music and Culture with Collaborative Specialization in Digital Humanities (5.0 credits)</b>		
<b>Requirements - Thesis pathway (5.0 credits)</b>		
<b>1. 1.0 credits in:</b>		<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 1.0 credit in additional MUSI course work chosen from available electives</b>		<b>1.0</b>
<b>3. 2.0 credits in:</b>		<b>2.0</b>
MUSI 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit from DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)</b>		<b>0.5</b>
<b>6. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	0.0
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (5.0 credits)</b>		
<b>1. 1.0 credits in:</b>		<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.0 credits additional MUSI course work chosen from available elective courses</b>		<b>2.0</b>
<b>3. 1.0 credit in:</b>		<b>1.0</b>
MUSI 5908 [1.0]	Research Essay (in the specialization)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit from DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)</b>		<b>0.5</b>
<b>6. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>		
<b>1. 1.0 credits in:</b>		<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.5 credits in additional MUSI course work chosen from available elective courses</b>		<b>2.5</b>
<b>3. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>4. 1.0 credit from:</b>		<b>1.0</b>
DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities	

DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities	
DIGH 5902 [0.5]	Special Topics in Digital Humanities	
- or annually listed DIGH course		
<b>5. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>5.0</b>
<b>M.A. Philosophy with Collaborative Specialization in Digital Humanities (5.0 credits)</b>		
<b>Requirements - Thesis pathway (5.0 credits)</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
PHIL 5850 [0.5]	Proseminar	
PHIL 5900 [0.5]	Research Seminar	
<b>2. 2.0 credits in:</b>		<b>2.0</b>
PHIL 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>3. 1.0 credits in courses, subject to the following limitations:</b>		<b>1.0</b>
- They may include PHIL 5701 or PHIL 5751 but not both		
- They may include up to 0.5 credit from PHIL 5000, PHIL 5200, PHIL 5250, PHIL 5300, PHIL 5350, PHIL 5500, PHIL 5600, PHIL 5650, PHIL 5660, or, with permission of the department, other approved courses at the graduate or 4000-level at Carleton or other universities		
- They may include up to 0.5 credit in tutorials, or, with permission of the department, approved graduate-only courses at the graduate level in other departments or at other universities		
- They must include at least 0.5 credit in two of the following areas of study: history of philosophy, philosophy of mind, philosophy of language, logic, epistemology, or metaphysics, moral, social, or political philosophy		
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit in DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)</b>		<b>0.5</b>
<b>6. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (5.0 credits)</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
PHIL 5850 [0.5]	Proseminar	
PHIL 5900 [0.5]	Research Seminar	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
PHIL 5908 [1.0]	Research Essay (in the specialization)	
<b>3. 1.0 credit from:</b>		<b>1.0</b>
PHIL 5701 [0.5]	Fall Colloquium	
PHIL 5751 [0.5]	Winter Colloquium	
Or, with permission of the department, approved graduate-level courses in other departments or at other universities		
<b>4. 1.0 credit from:</b>		<b>1.0</b>
PHIL 5000 [0.5]	Special Topic in Philosophy	
PHIL 5200 [0.5]	Topics in Philosophy of Mind or Philosophy of Language	

PHIL 5250 [0.5]	Topics in Logic, Epistemology, Metaphysics or Philosophy of Science	
PHIL 5300 [0.5]	Topics in Value Theory	
PHIL 5350 [0.5]	Topics in Ethics or Political Philosophy	
PHIL 5500 [0.5]	Topics in Contemporary Philosophy	
PHIL 5600 [0.5]	Topics in the History of Philosophy	
PHIL 5650 [0.5]	Semantics	
PHIL 5660 [0.5]	Lexical Semantics	
Or, with permission of the department, approved courses at graduate or 4000-level at Carleton or other universities		
<b>5. 0.5 credit in</b>	DIGH 5000	0.5
<b>6. 0.5 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5
<b>7. 0.0 credit in:</b>		
	DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>Total Credits</b>		<b>5.0</b>

### M.A. Public History with Collaborative Specialization in Digital Humanities (5.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		0.5
	HIST 5003 [0.5]	Historical Theory and Method
<b>2. 0.5 credit in:</b>		0.5
	HIST 5700 [0.5]	Introduction to Public History
<b>3. 1.0 credit in</b>	designated public history courses.	1.0
<b>4. 0.5 credit in</b>	a graduate-level history course outside of public history.	0.5
<b>5. 0.5 credit in:</b>		0.5
	HIST 5703 [0.5]	Public History Internship
<b>6. 1.0 credit in:</b>		1.0
	HIST 5908 [1.0]	M.A. Research Essay (in the specialization)
<b>7. 0.5 credit in:</b>		0.5
	DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>8. 0.5 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5
<b>9. 0.0 credit in:</b>		0.0
	DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>Total Credits</b>		<b>5.0</b>

### M.A. Sociology with Collaborative Specialization in Digital Humanities (5.0 credits)

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		1.0
	SOCI 5005 [0.5]	Recurring Debates in Social Thought
	SOCI 5809 [0.5]	The Logic of the Research Process
<b>2. 2.0 credits in</b>	courses. With departmental permission one of the courses may be 0.5 credit at the 4000-level.	2.0
<b>3.</b>	An oral examination on the candidate's research essay and program	
<b>4. 1.0 credit in:</b>		1.0

SOCI 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>5. 0.5 credit in:</b>		0.5
	DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>6. 0.5 credit from:</b>		0.5
	DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities
	DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities
Or, annually listed DIGH course.		
<b>7. 0.0 credit in:</b>		0.0
	DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		1.0
	SOCI 5005 [0.5]	Recurring Debates in Social Thought
	SOCI 5809 [0.5]	The Logic of the Research Process
<b>2. 1.0 credit in</b>	courses	1.0
<b>3. 2.0 credits in:</b>		2.0
	SOCI 5909 [2.0]	M.A. Thesis (in the specialization)
<b>4.</b>	An oral examination on the candidate's thesis and program	
<b>5. 0.5 credit in:</b>		0.5
	DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>6. 0.5 credit from:</b>		0.5
	DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities
	DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities
Or, annual listed DIGH course		
<b>7. 0.0 credit in:</b>		0.0
	DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>Total Credits</b>		<b>5.0</b>

### Master of Cognitive Science with Collaborative Specialization in Digital Humanities (6.0 credits)

#### Requirements - Thesis pathway (6.0 credits)

<b>1. 0.5 credit in:</b>		0.5
	CGSC 5100 [0.5]	Issues in Cognitive Science
<b>2. 0.5 credit from:</b>		0.5
	CGSC 5101 [0.5]	Experimental Methods and Statistics
	or CGSC 5103 [0.5]	Formal Methods
<b>3. 1.5 credits in</b>	CGSC or other courses, from at least two different cognitive disciplines, selected with approval of the thesis supervisor and the graduate supervisor.	1.5
<b>4. 0.5 credit in:</b>		0.5
	DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>5. 0.5 credit from:</b>		0.5
	DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities
	DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities
or annually-listed DIGH course		
<b>6. 0.0 credit in:</b>		

DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>7. 2.5 credits in:</b>		<b>2.5</b>
CGSC 5909 [2.5]	M. Cog. Thesis (in the specialization)	
8. Students are required to present their research at the Cognitive Science Student Spring Conference (in either year)		
<b>Total Credits</b>		<b>6.0</b>
<b>Requirements - Research Project pathway (6.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
CGSC 5100 [0.5]	Issues in Cognitive Science	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
CGSC 5101 [0.5]	Experimental Methods and Statistics	
	or CGSC 5103 [0.5] Formal Methods	
<b>3. 1.5 credits from:</b>		<b>1.5</b>
CGSC 5001 [0.5]	Cognition and Artificial Cognitive Systems	
CGSC 5002 [0.5]	Experimental Research in Cognition	
CGSC 5003 [0.5]	Language and Cognition	
CGSC 5003 [0.5]	Language and Cognition	
CGSC 5004 [0.5]	Cognition and Conceptual Issues	
CGSC 5005 [0.5]	Cognition and Neuroscience	
<b>4. 1.5 credits in</b>	CGSC or other courses selected with approval of the project supervisor and graduate supervisor.	<b>1.5</b>
<b>5. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>6. 0.5 credit from:</b>		<b>0.5</b>
DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities	
DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities	
	or annually-listed DIGH course	
<b>7. 0.0 credit in:</b>		
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>8. 1.0 credit in:</b>		<b>1.0</b>
CGSC 5908 [1.0]	Research Project (in the specialization)	
9. Students are required to present their research at the Cognitive Science Student Spring Conference (in either year)		
<b>Total Credits</b>		<b>6.0</b>

## Regulations

See the General Regulations section of this Calendar, and the regulations of the participating unit offering the Specialization.

## Admission

Students who are enrolled in their first or second year of study in an M.A. in one of the collaborating programs may apply to the College of the Humanities for admission to the Collaborative Program. Admission to the program is determined by the Digital Humanities Management Committee and will normally take place before the end of August, although early acceptances (in the spring) will be

considered by the committee. Students will be selected for the program based on the following criteria:

- G.P.A. (based on university transcripts)
- Letter of intent (Application form)
- Recommendation of the participating program (application form)
- Balanced representation from different participating units
- Students whose M.A. theses have a Digital Humanities content

## Digital Humanities (DIGH) Courses

### DIGH 5000 [0.5 credit]

#### Issues in the Digital Humanities

Introduction to the theoretical and practical aspects of the Digital Humanities, including the historical and ongoing debates over its boundaries, methodologies, objectives and values.

Includes: Experiential Learning Activity

### DIGH 5011 [0.5 credit]

#### Graduate Practicum in Digital Humanities

Practical on-site work in a public institution or private sector company (as available), including a written assignment or equivalent project in alternative format. In collaborating programs with practicum programs, a maximum of 1.0 practicum credit may be applied towards degree requirements.

Includes: Experiential Learning Activity

### DIGH 5012 [0.5 credit]

#### Directed Readings and Research in Digital Humanities

Students pursue topics in the Digital Humanities, which they select in consultation with a member of the graduate faculty of the program.

Includes: Experiential Learning Activity

### DIGH 5800 [0.0 credit]

#### Digital Humanities: Professional Development

This course allows students to participate with Digital Humanities scholars and professionals in public discussions of topics in the Digital Humanities, as both presenter and audience member. The course is graded satisfactory/unsatisfactory based on attendance and engagement.

### DIGH 5902 [0.5 credit]

#### Special Topics in Digital Humanities

This course offers selected topics in Digital Humanities not available in the regular course offerings.

## Digital Media

This section presents the requirements for programs in:

- **M.A.Sc. Digital Media**
- **M.A.Sc. Digital Media with Collaborative Specialization in Cybersecurity**
- **M.A.Sc. Digital Media with Collaborative Specialization in Data Science**

### Program Requirements

#### M.A.Sc. Digital Media (5.0 credits)

##### Requirements:

<b>1. 0.0 credit in:</b>	
ITEC 5001 [0.0]	Information Technology Seminars
<b>2. 2.0 credits from</b> core courses (For students admitted to 4.0-credit program, 1.0 credit):	<b>2.0</b>
ITEC 5002 [0.5]	Fundamentals of Information Technology Research
ITEC 5010 [0.5]	Applied Programming I
ITEC 5200 [0.5]	Entertainment Technologies
ITEC 5201 [0.5]	Computer Animation Technologies
ITEC 5202 [0.5]	Visual Effects Technologies
ITEC 5203 [0.5]	Game Design and Development Technologies
ITEC 5204 [0.5]	Emerging Interaction Techniques
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications
ITEC 5206 [0.5]	Data Protection and Rights Management
ITEC 5207 [0.5]	Data Interaction Techniques
ITEC 5208 [0.5]	Virtual Reality and 3D User Interfaces
ITEC 5209 [0.5]	Empirical Research Methods in HCI
ITEC 5920 [0.5]	Special Topics in Digital Media
<b>3. 0.5 credit in</b> electives, which may include up to 0.5 credit from a 4000-level course, or a 0.5 credit graduate course from another discipline, with permission from their graduate supervisor or the Associate Director of Graduate Studies in the School.	<b>0.5</b>
<b>5. 2.5 credits in:</b>	<b>2.5</b>
ITEC 5909 [2.5]	Master's Thesis
<b>Total Credits</b>	<b>5.0</b>

#### M.A.Sc. Digital Media with Collaborative Specialization in Cybersecurity (5.0 credits)

##### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
<b>2. 0.0 credit in:</b>	
ITEC 5001 [0.0]	Information Technology Seminars
<b>3. 1.5 credit from</b> core courses:	<b>1.5</b>
ITEC 5002 [0.5]	Fundamentals of Information Technology Research
ITEC 5200 [0.5]	Entertainment Technologies
ITEC 5201 [0.5]	Computer Animation Technologies
ITEC 5202 [0.5]	Visual Effects Technologies

ITEC 5203 [0.5]	Game Design and Development Technologies
ITEC 5204 [0.5]	Emerging Interaction Techniques
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications
ITEC 5206 [0.5]	Data Protection and Rights Management
ITEC 5207 [0.5]	Data Interaction Techniques
ITEC 5208 [0.5]	Virtual Reality and 3D User Interfaces
ITEC 5209 [0.5]	Empirical Research Methods in HCI
ITEC 5920 [0.5]	Special Topics in Digital Media
<b>5. 2.5 credits in:</b>	<b>2.5</b>
ITEC 5909 [2.5]	Master's Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

#### M.A.Sc. Digital Media with Collaborative Specialization in Data Science (5.0 credits)

##### Requirements:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 1.5 credit from</b> core courses:	<b>1.5</b>
ITEC 5002 [0.5]	Fundamentals of Information Technology Research
ITEC 5010 [0.5]	Applied Programming I
ITEC 5200 [0.5]	Entertainment Technologies
ITEC 5201 [0.5]	Computer Animation Technologies
ITEC 5202 [0.5]	Visual Effects Technologies
ITEC 5203 [0.5]	Game Design and Development Technologies
ITEC 5204 [0.5]	Emerging Interaction Techniques
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications
ITEC 5206 [0.5]	Data Protection and Rights Management
ITEC 5207 [0.5]	Data Interaction Techniques
ITEC 5208 [0.5]	Virtual Reality and 3D User Interfaces
ITEC 5209 [0.5]	Empirical Research Methods in HCI
ITEC 5920 [0.5]	Special Topics in Digital Media
<b>4. 0.5 credit in</b> electives, which may include up to 0.5 credit from a 4000-level course, or a 0.5 credit graduate course from another discipline, with permission from their graduate supervisor or the Associate Director of Graduate Studies in the School.	<b>0.5</b>
<b>5. 2.5 credits in:</b>	<b>2.5</b>
ITEC 5909 [2.5]	Master's Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

**Note:** No additional IT seminar requirements for this stream.

### Admission

#### M.A.Sc. Digital Media

Students entering the program will have an undergraduate degree in one of the related three primary disciplines of Technology (e.g. Computer Science/Engineering

and Information Technology), Content (e.g. Arts and Humanities), and People (e.g. Psychology, Communication and Business).

All students will apply for the 5.0 credit M.A.Sc. Digital Media.

Applicants with substantial professional experience in digital media in Canada may be considered for admission to professional entry, requiring them to complete 4.0 credits, to be determined by the School of Information Technology and Graduate Studies.

### **Accelerated Pathway Digital Media**

The accelerated pathway in the M.A.Sc. Digital Media is a flexible and individualized plan of graduate study. Students in their final year of any relevant Carleton undergrad degree with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third or fourth year of study in the relevant degree should consult with both their Academic Advisor and the CSIT Associate Director for Graduate Studies to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### **Accelerated Pathway Requirements:**

1. At least 0.5 credit in one of the following courses ITEC 52XX or ITEC 5920 with a grade of B+ or higher;
2. Minimum overall CGPA of A-.

Students may receive advanced standing with transfer of up to 1.0 credit, which can reduce their time to completion. *Students presenting a demonstrated research ability (e.g. primary author of a research report), supported by the proposed thesis supervisor, and approved by the CSIT Associate Director for Graduate Studies, may be eligible to receive credit for ITEC 5002 [0.5 credit] Fundamentals of Information Technology Research.*

### **Regulations**

See the General Regulations section of this Calendar.

## **Information Technology (ITEC) Courses**

### **ITEC 5001 [0.0 credit]**

#### **Information Technology Seminars**

A seminar based course where the students make the presentations and participate in discussions. Some seminars done by guest lecturers. Graded Sat/Uns. Includes: Experiential Learning Activity

### **ITEC 5002 [0.5 credit]**

#### **Fundamentals of Information Technology Research**

Basic concepts and techniques in information technology, including information systems, algorithms and software development process, research methods, and research and technical writing.

Includes: Experiential Learning Activity

Precludes additional credit for ITEC 5000 (no longer offered).

### **ITEC 5010 [0.5 credit]**

#### **Applied Programming I**

Algorithm design and computer programming with practical industry problems in information technology. Topics include algorithms and pseudocode, programming fundamentals, memory operations, data structures, object oriented programming, program design, testing and debugging.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the graduate supervisor.

### **ITEC 5100 [0.5 credit]**

#### **Planning and Design of Computer Networks**

Planning process of computer networks; needs and technical requirements; modeling of different network planning problems; exact and approximate algorithms; topological planning and expansion problems; equipment (switch, router) location problem; approximate and optimal routing algorithms; presentation of various case studies.

Includes: Experiential Learning Activity

### **ITEC 5101 [0.5 credit]**

#### **Cross Layer Design for Wireless Multimedia Networks**

Quality of service measures at different layers. Parameter adaptation, trade-offs, and optimization at physical, data-link, network, transport, and application layers. Cross-layer design in cellular, ad hoc, sensor, local area, green, and cognitive radio networks.

### **ITEC 5102 [0.5 credit]**

#### **Designing Secure Networking and Computer Systems**

Network security with coverage of computer security in support of networking concepts. Security issues in data networks at different protocol layers. Routing security, worm attacks, and botnets. Security of new mobile networks and emerging networked paradigms such as social networks and cloud computing.

### **ITEC 5103 [0.5 credit]**

#### **Cloud and Datacentre Networking**

Special issues of the networking requirements in datacentres and cloud computing environments. Performance, power requirements, redundancy of datacentre networks.

**ITEC 5110 [0.5 credit]****Emerging Network Technologies**

Overview of technologies, protocols and techniques related to Information Technology networking that are either in their early stage of adoption or are not yet mainstream (i.e. beta or prototype stage). Focus will vary from year to year to reflect the evolutionary nature of this domain.

Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4000, for which additional credit is precluded.

**ITEC 5111 [0.5 credit]****Multimedia Networking**

Audio and video compression. H.261, JPEG, MPEG and DVI. Accessing audio and video from a web server. Real Time Streaming Protocol (RTSP). Multimedia operating systems. Multimedia database. Network support for multimedia applications. Multimedia synchronization. Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4007, for which additional credit is precluded.

**ITEC 5112 [0.5 credit]****Secure Mobile Networking**

The concept, principle and rationale of mobile networking. Mobile network architecture, protocols, mobility management, routing and mobile TCP/IP; Security challenges, vulnerabilities and threats in mobile networks; Security defense techniques and countermeasures in mobile networks.

Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4010, for which additional credit is precluded.

**ITEC 5113 [0.5 credit]****Network Simulation**

Introduction to discrete event simulation; fundamental stochastic models for networking; queueing theory; deterministic algorithms for networking; confidence intervals; introduction to network modeling. Simulation exercises including traffic monitoring, congestion, routing protocols, resource utilization and growth planning using OPNET simulation tool.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4001, for which additional credit is precluded.

**ITEC 5114 [0.5 credit]****Networked Applications**

Architectures for computing in modern data networks that adopt the Internet architecture. Topics covered include socket programming, RPC and RMI. Client-server and peer-to-peer models. Emerging application architectures. Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4005, for which additional credit is precluded.

**ITEC 5200 [0.5 credit]****Entertainment Technologies**

Advanced topics in entertainment technologies which may include web-based, film and television, video games and/or interactive systems.

**ITEC 5201 [0.5 credit]****Computer Animation Technologies**

Advanced topics in computer animation: full body motion capture, space-time systems, physics-based animation, realistic rendering techniques, industry methods for large scene animations and live action integration; behavioural animation.

**ITEC 5202 [0.5 credit]****Visual Effects Technologies**

Advanced look at the processes and technologies in visual effects, specifically in advanced processing of virtual sets (e.g. using chroma-keying), lighting and colour integration, filming technologies, motion tracking, and the integration of 3D objects/elements into real scenes.

**ITEC 5203 [0.5 credit]****Game Design and Development Technologies**

Advanced technologies in the development of computer game systems and gameplay experiences, focused on Procedural Content Generation. Automatic or semi-automatic methods for producing game levels, objects, characters, and narratives.

**ITEC 5204 [0.5 credit]****Emerging Interaction Techniques**

Advanced interaction styles and their associated technologies. Topics may include hand held and gestural interactions, ubiquitous computing, deformable user interfaces, physiological computing and tangible user interfaces.

Also listed as HCIN 5300.

**ITEC 5205 [0.5 credit]****Design and Development of Data-Intensive Applications**

Design and development of data-intensive applications dealing with large-scale data. Data may include spatial data, time series, text, social media and different forms of digital media. Data modeling and management techniques will be discussed that enhance data analysis techniques and improve data-intensive applications.

**ITEC 5206 [0.5 credit]****Data Protection and Rights Management**

Understanding how to use technology to implement data privacy, security, protection and related legal issues. Insights on how to develop systems for managing digital rights, data privacy rules, laws or policies relevant to different jurisdictions, rights, and responsibilities for protecting data and personal information. Precludes additional credit for DATA 5002.

**ITEC 5207 [0.5 credit]****Data Interaction Techniques**

Design and development of how humans (e.g., end-users, knowledge-users and expert-users) interact with data ecosystem like data collection, storage, analysis and visualization. Techniques, methods and tools will be discussed on how humans interact with data based on capabilities of machines and needs of humans.

**ITEC 5208 [0.5 credit]****Virtual Reality and 3D User Interfaces**

Research in and design of virtual reality and 3D systems. Applications, history, human factors, display and input hardware, and interaction techniques for navigation, selection and manipulation. Students develop and evaluate a VR or 3D system using game engines and devices such as head-mounted displays. Includes: Experiential Learning Activity. Also listed as HCIN 5501.

**ITEC 5209 [0.5 credit]****Empirical Research Methods in HCI**

Advanced quantitative methods and conducting controlled user studies, statistically analyzing and reporting results in a research paper. Topics include history of empirical HCI, experiment design, hypothesis testing, interaction models, and scientific writing. Students complete a term-long research project. Includes: Experiential Learning Activity. Also listed as HCIN 5407. Also offered at the undergraduate level, with different requirements, as ITEC 4021, for which additional credit is precluded.

**ITEC 5900 [0.5 credit]****Directed Studies**

A course of independent study that fits the student's area of interest under the supervision of a faculty member of the School.

**ITEC 5909 [2.5 credits]****Master's Thesis**

Includes: Experiential Learning Activity

**ITEC 5910 [0.5 credit]****Special Topics in Network Technologies**

Recent and advanced topics in network technologies. Trends in wireless networking, software defined networks, power-line networking. Students may be expected to contribute to lectures or seminars.

**ITEC 5920 [0.5 credit]****Special Topics in Digital Media**

Recent and advanced topics in Digital Media. Students may be expected to contribute to lectures or seminars.

**ITEC 6200 [0.5 credit]****Introduction to Interdisciplinary Research in Information Technology**

Introduction to concepts and practices for research in Information Technology. Understanding the defining properties of computer-based systems and related technologies. Emphasis on bringing together skills related to technology, people and content in order to solve problems and explore new possibilities.

**ITEC 6900 [0.5 credit]****Directed Studies**

A course of independent study that fits the student's area of interest under the supervision of a faculty member of the School.

**ITEC 6907 [0.0 credit]****Doctoral Qualifying Examination**

Ph.D. qualifying examination in the student's field. The exam consists of a written submission and an oral examination.

**ITEC 6908 [0.0 credit]****Doctoral Proposal**

Ph.D. thesis proposal. Defending a proposal consists of a written submission and an oral examination. Prerequisite(s): ITEC 6907 and permission of the School.

**ITEC 6909 [0.0 credit]****Doctoral Thesis**

Includes: Experiential Learning Activity

Prerequisite(s): ITEC 6908 and permission of the School.

**ITEC 6920 [0.5 credit]****Selected Topics in Digital Media**

Recent and advanced topics in Digital Media. Students are expected to contribute to lectures or seminars.

## Earth Sciences

This section presents the requirements for programs in:

- **M.Sc. Earth Sciences**
- **M.Sc. Earth Sciences with Collaborative Specialization in Chemical and Environmental Toxicology**
- **Ph.D. Earth Sciences**
- **Ph.D. Earth Sciences with Collaborative Specialization in Chemical and Environmental Toxicology**

**Program Requirements****M.Sc. Earth Sciences (5.0 credits)****Requirements:**

1. 1.5 credit in course work, 0.5 credit of which may be at the senior undergraduate level	1.5
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2. 3.5 credits in:	3.5
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ERTH 5909 [3.5]	M.Sc. Thesis (defended at an oral examination)
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3. A pre-defence public lecture, preceding the oral examination, based on the thesis research

4. 0.0 credit in: participation in the OCGC Seminar Series. Each student gives a presentation of one lecture (open to all members of the OCGC) describing the candidate's research study within 16 months of the candidate's registration in the M.Sc. program.	
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<b>Total Credits</b>	<b>5.0</b>
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**M.Sc. Earth Sciences****with Collaborative Specialization in Chemical and Environmental Toxicology (5.0 credits)****Requirements:**

1. 0.5 credit in:	0.5
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BIOL 6402/	Principles of Toxicology
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CHEM 5708 [0.5]	
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or BIOL 6403 [0.5]	Ecotoxicology
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or CHEM 5705 [0.5]	Ecotoxicology
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2. 0.5 credit in:	0.5
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BIOL 6405/	Seminar in Toxicology
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CHEM 5805 [0.5]	
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3. 0.5 credit in additional course work	0.5
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4. 3.5 credits in:	3.5
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ERTH 5909 [3.5]	M.Sc. Thesis (in the specialization)
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5. A pre-defence public lecture, preceding the oral examination, based on the thesis research

6. 0.0 credit: participation in the OCGC Seminar Series. Each student gives a presentation of one lecture (open to all members of the OCGC) describing the candidate's research study within 16 months of the candidate's registration in the M.Sc. program.	
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<b>Total Credits</b>	<b>5.0</b>
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**Ph.D. Earth Sciences (1.0 credit)****Requirements:**

1. 1.0 credit of course work at the graduate level.	1.0
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Additional courses may be prescribed by the thesis advisory committee	
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ERTH 6908 [0.0]	Ph.D. Comprehensive Examination (Conducted by the thesis advisory committee. Includes the presentation of a thesis proposal and involves three areas of geoscience specialization chosen by the student's advisory committee and approved by the Director of the Ottawa-Carleton Geoscience Centre)	
<b>2. 0.0 credits in:</b>		<b>0.0</b>
ERTH 6909 [0.0]	Ph.D. Thesis (defended at an oral examination before an examination board that includes an external examiner)	
<b>3. A pre-defence public lecture, preceding the oral examination, based on the thesis research</b>		<b>0.0</b>
<b>4. 0.0 credit in: participation in the OCGC Seminar Series. Each student gives a presentation of one lecture (open to all members of the OCGC) describing the candidate's research study within 16 months of the candidate's registration in the Ph.D. program.</b>		<b>0.0</b>
<b>5. Fulfilment of residence requirement: at least four terms of full-time study</b>		<b>0.0</b>
<b>Total Credits</b>		<b>1.0</b>

### Ph.D. Earth Sciences with Collaborative Specialization in Chemical and Environmental Toxicology (1.0 credit)

#### Requirements:

<b>1. 0.0 credits in:</b>		
ERTH 6909 [0.0]	Ph.D. Thesis (a research thesis on a topic in toxicology supervised by a faculty member of the Collaborative Program in Chemical and Environmental Toxicology, defended at an oral examination before an examination board that includes an external examiner)	
<b>2. A pre-defence public lecture, preceding the oral examination, based on the thesis research</b>		
<b>3. 1.0 credit in:</b>		<b>1.0</b>
BIOL 6402 [0.5] or CHEM 5708 [0.5]	Principles of Toxicology	
BIOL 6405 [0.5] or CHEM 5805 [0.5]	Seminar in Toxicology	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
ERTH 6908 [0.0]	Ph.D. Comprehensive Examination (Conducted by the thesis advisory committee. Includes the presentation of a thesis proposal)	
<b>5. 0.0 credit in: participation in the OCGC Seminar Series. Each student gives a presentation of one lecture (open to all members of the OCGC) describing the candidate's research study within 16 months of the candidate's registration in the Ph.D. program.</b>		<b>0.0</b>
<b>6. Fulfilment of residence requirement: at least four terms of full-time study</b>		<b>0.0</b>
<b>Total Credits</b>		<b>1.0</b>

#### Regulations

See the General Regulations section of this Calendar.

A grade of B- or higher is required for each course counted towards the Master's degree.

#### Regulations

See the General Regulations section of this Calendar.

#### Admission

The requirement for admission to the program is an Honours B.Sc. degree, with at least high honours standing, in geology or a related discipline.

#### Accelerated Pathway

The accelerated pathway in the Department of Earth Sciences is a flexible and individualized plan of graduate study. Students in the final year of the B.Sc. Honours degree in Earth Sciences may apply with the agreement of their B.Sc. Honours supervisor, within the deadline of January 15th of the year the B.Sc.H. will be completed.

Students may receive advanced standing with transfer of up to 1.0 credit which will reduce their time to completion.

The M.Sc. thesis may include results from the honours thesis but must contain significant additional research.

#### Accelerated Pathway Requirements

1. 1.0 credit in EARTH courses at the 5000-level with a grade of B+ or higher.

2. Minimum overall and Major CGPA of A-.

#### Admission

The requirement for admission to the Ph.D. Program is an M.Sc. degree in Earth Sciences or a related discipline. A grade of B- or higher is required for each course to be counted.

#### Earth Sciences (ERTH) Courses

##### ERTH 5001 [0.5 credit] (GEO 5301)

##### Seminars in Earth Sciences I

One-term modular courses covering a spectrum of Earth Science topics and current research problems, ranging from the geology and geophysics of the solid Earth, to its surface environment and crustal resources. Course complements EARTH 5002.

Precludes additional credit for Students may not take a module for credit that is offered by their supervisor, but may do so with the permission of the OCGC Director.

A minimum of four modules offered per term, three must be completed to obtain course credit. Choice of modules must be approved by the OCGC Director.

**ERTH 5002 [0.5 credit] (GEO 5302)****Seminars in Earth Sciences II**

One-term modular courses covering a spectrum of Earth Science topics and current research problems, ranging from the geology and geophysics of the solid Earth, to its surface environment and crustal resources. Course complements EARTH 5001.

Precludes additional credit for Students may not take a module for credit that is offered by their supervisor, but may do so with the permission of the OCGC Director. A minimum of four modules offered per term, three must be completed to obtain course credit. Choice of modules must be approved by the OCGC Director.

**ERTH 5104 [0.5 credit] (GEO 5114)****Mineralogy**

An advanced course covering selected topics in mineralogy, such as crystallography, crystal chemistry, crystal structure, mineralogy of rock-forming mineral groups, and instrumental methods in mineralogical research, such as use of electronic optical instruments, spectroscopy, and X-ray crystallography; seminar presentations and practical exercises.

**ERTH 5105 [0.5 credit] (GEO 5115)****Thermodynamics, Kinetic Theory, and Metamorphic Petrology**

Phase equilibria, phase diagrams, and the kinetics of mineral reactions; mass transfer; regional and global aspects of metamorphic petrogenesis. Course may include one or two weeks of field-based instruction with costs borne by students.

Includes: Experiential Learning Activity

**ERTH 5202 [0.5 credit] (GEO 5122)****Advanced Igneous Petrology**

Integrates physical and chemical processes with the dynamics of magmatic systems to understand igneous processes. Course may involve a field trip with costs to be paid by students.

Includes: Experiential Learning Activity

**ERTH 5204 [0.5 credit] (GEO 5124)****Geology and Geochemistry of Ore Deposits**

An advanced course in ore deposits examining aspects of their geology, geochemistry, and exploration. Topics will be selected from a range of different deposit types, including hydrothermal and magmatic ore deposits, as well as laboratory and field examination of different ores and their host rocks.

Includes: Experiential Learning Activity

**ERTH 5206 [0.5 credit] (GEO 5306)****Hydrothermal Ore Deposits**

Advanced economic geology course on hydrothermal ore deposits including geology and geochemistry, physical and chemical controls on mineralization, recognition and characterization of ore-fluid reservoirs, nature of large-scale fluid flow and alteration, and applications to exploration.

**ERTH 5207 [0.5 credit]****Advanced Contaminant and Remediation Hydrogeology**

Geochemical and physical principles controlling contaminant release, migration, and fate in subsurface systems, including application of geochemical and reactive transport models for quantification of contaminant source terms and mitigation and remediation processes. Examples related to mining and industrial wastes and natural groundwater systems.

Prerequisite(s): EARTH 3205.

Also offered at the undergraduate level, with different requirements, as EARTH 4206., for which additional credit is precluded.

**ERTH 5215 [0.5 credit] (GEO 5125)****Natural Hazards in Canada - Risk and Impact**

Overview of natural hazards and severe weather phenomena in Canada. Notions of risk, return period, and probability of occurrence of natural disasters. Impact on society and infrastructure. Mitigation policies and strategies.

Also listed as IPIS 5505.

Also offered at the undergraduate level, with different requirements, as EARTH 4815, for which additional credit is precluded.

**ERTH 5301 [0.5 credit] (GEO 5131)****Siliciclastic Sedimentology**

Origin and significance of physical sedimentary processes and structures. Analysis of ancient siliciclastic depositional environments in a facies model and sequence stratigraphic framework. Course involves lectures, seminars and field excursions.

Includes: Experiential Learning Activity

**ERTH 5302 [0.5 credit]****Frozen Earth: Unveiling the Snowball Earth Catastrophe**

Discover how icy cataclysms shaped our planet through Earth's most extreme climate event: Snowball Earth!

We will explore this theory's origins, examine compelling geologic and geochemical evidence, and dive into topics such as glacial sedimentology, the carbon cycle, evolution, and more on this thrilling adventure.

Also offered at the undergraduate level, with different requirements, as EARTH 4302., for which additional credit is precluded.

**ERTH 5305 [0.5 credit] (GEO 5135)****Carbonate Sedimentology**

Aspects of modern depositional systems, dynamic facies models, sequence stratigraphy, mineralogy, and diagenesis of carbonate sediments. The practical part of the course will consist of a field-laboratory project that integrates various techniques in carbonate sedimentology (mapping, petrography, staining, cathodoluminescence, fluorescence, SEM).

Includes: Experiential Learning Activity

**ERTH 5306 [0.5 credit] (GEO 5136)****Paleobiology**

Extinctions, micro- and macro-evolutionary processes, long-term trends and cycles in the Phanerozoic; functional morphology; application of invertebrates to biostratigraphy, paleoceanography and paleolimnology. May include one or two weeks of field-based instruction with costs borne by the student.

**ERTH 5307 [0.5 credit] (GEO 5137)****Evolutionary Developmental Biology**

This course explores the mechanistic basis of organismic evolution from genetic, morphogenetic and epigenetic perspectives, within a phylogenetic context of living and extinct vertebrates.

Includes: Experiential Learning Activity

**ERTH 5308 [0.5 credit] (GEO 5138)****Advanced Micropaleontology**

Paleobiology, biostratigraphy and paleoecology of microfossils in the context of paleoceanography, paleolimnology and paleoclimatology. Course may involve a field trip with costs to be paid by students.

Includes: Experiential Learning Activity

**ERTH 5403 [0.5 credit] (GEO 5143)****Environmental Isotopes and Groundwater Geochemistry**

Geochemistry and environmental isotopes in studies of groundwater dynamics, age and contaminant hydrogeology. Environments from shallow groundwater and surface water to deep crustal brines are examined. Low temperature aqueous geochemistry and mineral solubility with emphasis on the carbonate system.

**ERTH 5405 [0.5 credit] (GEO 5145)****Radioisotope Geochemistry Methods**

Overview of the basic principles of radiochemistry and examination of the occurrence, sources and production of radionuclides in the earth system that have been used extensively in environmental and geochemical studies. Discussion of and practice using the key methods of radionuclide detection.

**ERTH 5407 [0.5 credit] (GEO 5147)****Aqueous Inorganic Geochemistry and Modelling**

Covers concepts in aqueous geochemistry including ion hydration and hydrolysis, aqueous activity, complexation, mineral solubility, carbonate system, redox, adsorption/surface complexation and reaction kinetics. Bi-weekly assignments provide an introduction to equilibrium geochemical modelling.

**ERTH 5409 [0.5 credit]****Reactive Transport Modelling**

Introduction to the theory of numerical models and application of reactive transport models in hydrogeology. Focus will be on development of appropriate conceptual models of flow, transport and bio- and geochemical reactions and simulation of these conceptual models using reactive transport codes.

**ERTH 5414 [0.5 credit] (GEO 5144)****Isotope Mapping and Provenance Applications**

Isotopes are used to trace provenance of organic and inorganic materials. This course will discuss how traditional isotope systems vary in the environment at different spatiotemporal scales and how mapping their variations can solve problems in hydrology, climatology, ecology, and archeology.

Includes: Experiential Learning Activity

**ERTH 5501 [0.5 credit] (GEO 5151)****Precambrian Geology**

Geology of the main Archean cratons and Proterozoic belts with emphasis on North America. Formation of the Earth, composition and evolution of the crust and mantle during the first 4 billion years of Earth's history, from its formation to the end of the Proterozoic.

Includes: Experiential Learning Activity

**ERTH 5503 [0.5 credit] (GEO 5153)****Computer Techniques in the Earth Sciences**

A practical course for mapping; quantitative analysis, integration and modeling of spatial data related to geosciences and engineering applications using a combination of GIS, statistical and geostatistical analysis techniques.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**ERTH 5505 [0.5 credit] (GEO 5155)****Climate Change**

Considers climate changes and their driving mechanisms over a broad range of timescales based on observations from geological archives and more recent instrumented evidence. Future climate projections and their accuracy are also considered.

Includes: Experiential Learning Activity

**ERTH 5507 [0.5 credit] (GEO 5157)**  
**Tectonic Processes Emphasizing Geochronology and Metamorphism**

Applications of empirical, analytical and quantitative techniques to problems in regional geology and crustal tectonics; orogenic processes; heat and metamorphism; isotopic geochronology as applied to thermal history.

**ERTH 5600 [0.5 credit] (GEO 5160)**  
**Chemistry of the Earth**

An examination of the composition of the mantle and crust in selected tectonic settings, such as subduction zones and hot spots. Topics may include how geochemical data constrain geodynamic settings of study areas.

**ERTH 5603 [0.5 credit] (GEO 5163)**  
**Stable Isotope Geochemistry**

Mechanisms of isotope fractionation in nature; physical and chemical isotope fractionation, kinetic isotope effects. Variation of stable isotope ratios (hydrogen/carbon/oxygen/sulphur) in nature. Preparation techniques of natural samples for isotope analysis. Applications of stable isotopes to study magma genesis, ore genesis, nature.

**ERTH 5609 [0.5 credit] (GEO 5169)**  
**Radiogenic Isotope Geochemistry**

Radiogenic isotope systematics applied to the solid Earth and their use to understand various geological processes. Evolution of large-scale isotopic reservoirs throughout Earth's history. Application of different radiometric dating techniques, assessment of geochronological data, models and interpretations.

**ERTH 5701 [0.5 credit] (GEO 5171)**  
**Physics of the Earth**

The physics and dynamics of the solid Earth: seismology; gravitational and magnetic fields, thermal state. Geophysical constraints on the structure and composition of the interior. Geodynamic processes. Also offered at the undergraduate level, with different requirements, as EARTH 4801, for which additional credit is precluded.

**ERTH 5703 [0.5 credit] (GEO 5173)**  
**Structural Geology**

Deformation processes and the analysis of geological structures at all scales.

**ERTH 5704 [0.5 credit] (GEO 5174)**  
**Tectonics**

Dynamic and geological aspects of plate tectonics throughout Earth history.

**ERTH 5707 [0.5 credit] (GEO 5177)**  
**Engineering Seismology**

Seismological topics with engineering applications. Characterization of seismicity and seismic sources (areas and faults). Seismic hazard analysis. Empirical and theoretical modeling of strong ground motion in time and frequency domain.

**ERTH 5708 [0.5 credit] (GEO 5178)**  
**Earthquake Signal Processing**

Theoretical and practical aspects of earthquake signal processing, seismic instrumentation, instrument response and application of spectral analysis and response spectra.

**ERTH 5901 [0.5 credit] (GEO 5191)**  
**Research Topics in Earth Sciences**

Directed reading/field/laboratory studies unrelated to thesis research, under the guidance of directors other than the thesis supervisor. A written proposal including research plan, deliverables, and evaluation, must be submitted for departmental approval prior to registration. Written report required. Includes: Experiential Learning Activity

**ERTH 5903 [0.5 credit] (GEO 5193)**  
**Field Studies**

Field investigations of geological problems, unrelated to thesis research, under the guidance of directors other than the thesis supervisor. Minimum of fifteen days field work. A written proposal including research plan, deliverables, and evaluation must be submitted for departmental approval prior to registration. Includes: Experiential Learning Activity

**ERTH 5906 [0.0 credit] (GEO 5193)**  
**M.Sc. Geoscience Seminar**

Participation in the Geoscience Seminar Series.

**ERTH 5907 [0.0 credit] (GEO 5193)**  
**Ph.D. Geoscience Seminar**

Participation in the Geoscience Seminar Series.

**ERTH 5909 [3.5 credits] (GEO 7999)**  
**M.Sc. Thesis**

A thesis proposal must be approved by the research advisory committee by the end of the first year of registration. Includes: Experiential Learning Activity

**ERTH 6908 [0.0 credit] (GEO 9998)**  
**Ph.D. Comprehensive Examination**

The Comprehensive Examination involves a thesis proposal and oral examination in three different areas of specialization. Students will receive a grade of Satisfactory or Unsatisfactory. This exam is taken within the first twelve months of registration in the program.

**ERTH 6909 [0.0 credit] (GEO 9999)**  
**Ph.D. Thesis**

A thesis proposal must be approved by the research advisory committee by the end of the first year of registration.

Includes: Experiential Learning Activity

## Economics

This section presents the requirements for programs in:

- **M.A. Economics**
- **M.A. Economics with Concentration in Financial Economics**
- **M.A. Economics with Collaborative Specialization in African Studies**
- **M.A. Economics with Collaborative Specialization in Climate Change**
- **M.A. Economics with Collaborative Specialization in Data Science**
- **Master of Arts Economics with Concentration in Financial Economics - Master of Business Administration with Concentration in Finance and Economics**
- **Ph.D. Economics**

### Program Requirements

#### M.A. Economics (4.0 credits)

##### Requirements - Coursework pathway (4.0 credits)

<b>1. 1.5 credits in:</b>	<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory
ECON 5021 [0.5]	Macroeconomic Theory
ECON 5027 [0.5]	Econometrics I
<b>2. 0.5 credit in:</b>	<b>0.5</b>
ECON 5029 [0.5]	Methods of Economic Research
<b>3. 0.5 credit from:</b>	<b>0.5</b>
ECON 5055 [0.5]	Financial Econometrics
ECON 5712 [0.5]	Micro-Econometrics
ECON 5713 [0.5]	Time-Series Econometrics
<b>4. 1.5 credits in approved electives</b>	<b>1.5</b>
<b>Total Credits</b>	<b>4.0</b>

##### Requirements - Thesis pathway (4.0 credits)

<b>1. 1.5 credits in:</b>	<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory
ECON 5021 [0.5]	Macroeconomic Theory
ECON 5027 [0.5]	Econometrics I
<b>2. 0.5 credit from:</b>	<b>0.5</b>
ECON 5055 [0.5]	Financial Econometrics
ECON 5712 [0.5]	Micro-Econometrics
ECON 5713 [0.5]	Time-Series Econometrics
<b>3. 0.5 credit in approved electives</b>	<b>0.5</b>
<b>4. 1.5 credits in:</b>	<b>1.5</b>
ECON 5909 [1.5]	M.A. Thesis
<b>Total Credits</b>	<b>4.0</b>

#### M.A. Economics with Concentration in Financial Economics (4.0 credits)

##### Requirements - Coursework pathway (4.0 credits)

<b>1. 1.5 credits in:</b>	<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory
ECON 5021 [0.5]	Macroeconomic Theory
ECON 5027 [0.5]	Econometrics I
<b>2. 1.0 credit in:</b>	<b>1.0</b>

ECON 5051 [0.5]	Asset Pricing	
ECON 5052 [0.5]	Financial Markets and Instruments	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
ECON 5029 [0.5]	Methods of Economic Research	
<b>4. 0.5 credit in</b>	elective concentration from:	<b>0.5</b>
ECON 5055 [0.5]	Financial Econometrics	
ECON 5058 [0.5]	Advanced Topics in Financial Economics	
ECON 5602 [0.5]	International Monetary Theory and Policy	
ECON 5608 [0.5]	Monetary Economics and Financial Intermediation	
ECON 5713 [0.5]	Time-Series Econometrics	
<b>5. 0.5 credit in</b>	approved course (which may be an additional course from the elective concentration list)	<b>0.5</b>
<b>Total Credits</b>		<b>4.0</b>

#### Requirements - Thesis pathway (4.0 credits)

<b>1. 1.5 credits in:</b>		<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
ECON 5051 [0.5]	Asset Pricing	
ECON 5052 [0.5]	Financial Markets and Instruments	
<b>3. 1.5 credit in:</b>		<b>1.5</b>
ECON 5909 [1.5]	M.A. Thesis	
<b>Total Credits</b>		<b>4.0</b>

### M.A. Economics with Collaborative Specialization in African Studies (4.0 credits)

#### Requirements - Coursework pathway (4.0 credits)

<b>1. 1.5 credits in:</b>		<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>3. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
ECON 5029 [0.5]	Methods of Economic Research including a research paper on an African Studies topic approved by the Graduate Committee of the Institute of African Studies	
<b>5. 0.5 credit in</b>	African Studies elective approved by the M.A. Supervisor of the Department of Economics	<b>0.5</b>
<b>6. 1.0 credit in</b>	ECON approved by the M.A. Supervisor of the Department of Economics, including at least 0.5 credit from ECON 5500, ECON 5504, ECON 5505	<b>1.0</b>
<b>Total Credits</b>		<b>4.0</b>

#### Requirements - Thesis pathway (4.0 credits)

<b>1. 1.5 credits in:</b>		<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	

ECON 5027 [0.5]	Econometrics I	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>3. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>4. 1.5 credit in:</b>		<b>1.5</b>
ECON 5909 [1.5]	M.A. Thesis on an African Studies topic approved by the Graduate Committee of the Institute of African Studies	
<b>5. 0.5 credit from:</b>		<b>0.5</b>
ECON 5500 [0.5]	Development Economics I	
ECON 5504 [0.5]	Development Economics II	
ECON 5505 [0.5]	Selected Topics in Development Economics	
<b>Total Credits</b>		<b>4.0</b>

### M.A. Economics with Collaborative Specialization in Climate Change (4.0 credits)

#### Requirements - Coursework pathway (4.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credit in:</b>		<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
ECON 5029 [0.5]	Methods of Economic Research (including a research paper on a Climate Change-related topic)	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
ECON 5507 [0.5]	Environmental Aspects of Economic Development	
ECON 5803 [0.5]	Economics of Natural Resources	
ECON 5804 [0.5]	Economics of the Environment	
ECON 5805 [0.5]	Topics in Environmental and Resource Economics	
	or approved Special Topic in the area of Climate Change	
<b>6. 0.5 credit in</b>	ECON at the 5000 level with sufficient Climate Change content (may be an additional course from Item 5 above), chosen in consultation with Department of Economics	<b>0.5</b>
<b>Total Credits</b>		<b>4.0</b>

#### Requirements - Thesis pathway (4.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
<b>4. 1.5 credits in:</b>		<b>1.5</b>

ECON 5909 [1.5]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>4.0</b>
<b>M.A. Economics with Collaborative Specialization in Data Science (4.0 credits)</b>		
<b>Requirements - Coursework pathway (4.0 credits)</b>		
<b>1. 1.5 credits in:</b>		<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
ECON 5029 [0.5]	Methods of Economic Research	
including a research paper on a data science related topic		
<b>4. 0.5 credit from:</b>		<b>0.5</b>
ECON 5055 [0.5]	Financial Econometrics	
ECON 5361 [0.5]	Labour Economics I	
ECON 5362 [0.5]	Labour Economics II	
ECON 5712 [0.5]	Micro-Econometrics	
ECON 5713 [0.5]	Time-Series Econometrics	
or approved Special Topics course (ECON 5880) in the area of Data Science		
<b>5. 0.5 credit in</b>	ECON approved by the M.A. Supervisor of the Department of Economics	<b>0.5</b>
<b>6. 0.5 credit in</b>	Data Science elective (which may be an additional course from the preceding list) approved by the M.A. Supervisor of the Department of Economics	<b>0.5</b>
<b>Total Credits</b>		<b>4.0</b>
<b>Requirements - Thesis pathway (4.0 credits)</b>		
<b>1. 1.5 credits in:</b>		<b>1.5</b>
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 1.5 credit in:</b>		<b>1.5</b>
ECON 5909 [1.5]	M.A. Thesis	
on a data science topic approved by the Data Science governance committee		
<b>4. 0.5 credit from:</b>		<b>0.5</b>
ECON 5055 [0.5]	Financial Econometrics	
ECON 5361 [0.5]	Labour Economics I	
ECON 5362 [0.5]	Labour Economics II	
ECON 5712 [0.5]	Micro-Econometrics	
ECON 5713 [0.5]	Time-Series Econometrics	
or approved Special Topics course (ECON 5880) in the area of Data Science		
<b>Total Credits</b>		<b>4.0</b>

**Master of Arts Economics with Concentration in Financial Economics - Master of Business Administration with Concentration in Finance and Economics (10.0 credits)**

Students completing the dual degree pathway will graduate with: M.A. Economics with Concentration in

Financial Economics, and M.B.A. with Concentration in Financial Economics.

**Requirements:**

<b>1. 6.0 credits in compulsory courses:</b>		<b>6.0</b>
ACCT 5001 [0.25]	Financial Accounting	
ACCT 5002 [0.25]	Managerial Accounting	
BUSI 5802 [0.25]	Business Ethics	
BUSI 5998 [0.0]	MBA Skills Workshop	
ECON 5020 [0.5]	Microeconomic Theory	
ECON 5021 [0.5]	Macroeconomic Theory	
ECON 5027 [0.5]	Econometrics I	
ECON 5029 [0.5]	Methods of Economic Research	
FINA 5501 [0.25]	Financial Management	
FINA 5502 [0.25]	Corporate Finance	
IBUS 5701 [0.25]	International Business	
ITIS 5401 [0.25]	Managing Information Systems in Organizations	
MGMT 5100 [0.5]	Managing People and Organizations	
MKTG 5200 [0.5]	Marketing Strategy	
TOMS 5302 [0.25]	Operations Management	
STGY 5900 [0.5]	Corporate and Business Strategy	
STGY 5903 [0.5]	Strategic Concepts	
<b>2. 1.75 credits in required concentration courses:</b>		<b>1.75</b>
ECON 5051 [0.5]	Asset Pricing	
ECON 5052 [0.5]	Financial Markets and Instruments	
FINA 5512 [0.25]	Valuation	
FINA 5513 [0.25]	Mergers and Acquisitions	
FINA 5521 [0.25]	Financial Management Concentration Integration	
<b>3. 0.5 credit in elective concentration from:</b>		<b>0.5</b>
ECON 5055 [0.5]	Financial Econometrics	
ECON 5058 [0.5]	Advanced Topics in Financial Economics	
ECON 5602 [0.5]	International Monetary Theory and Policy	
ECON 5608 [0.5]	Monetary Economics and Financial Intermediation	
ECON 5713 [0.5]	Time-Series Econometrics	
<b>4. 0.75 credit in M.B.A. elective courses</b>		<b>0.75</b>
<b>5. 1.0 credit in:</b>		<b>1.0</b>
BUSI 5999 [1.0]	Internship (Students with less than two (2) years of relevant professional employment experience must successfully complete the Internship in order to graduate. Students with two or more years relevant work experience may apply for an exemption.)	
<b>Total Credits</b>		<b>10.0</b>

**Internship Placement**

An Internship option is available to full-time students in the M.A. program who are eligible to work in Canada. Registration in the Internship option requires departmental permission and is limited by availability of placements. Application for an internship placement will normally be

considered after the student has successfully completed 2.0 credits, including ECON 5020 and ECON 5027.

Internship placements will locate students for at least one term in the public service, the private sector, or non-governmental organizations. Students will integrate theoretical and applied economic analysis in their work experience. During their work term, students are required to register in ECON 5902 (Internship Placement), which is additional to the program requirements described above. While taking ECON 5902, students are considered to be part-time, and may register for at most 1.0 credit in total.

If the student is in receipt of a teaching assistantship, a research assistantship, or some other type of scholarship, the value of the award will be deferred to a later term. External awards will be issued or deferred in accordance with the relevant criteria of the associated agency.

### Ph.D. Economics (6.0 credits)

Notwithstanding additional course work that may be required by the admissions committee as a condition of entry, students admitted to the Ph.D. program are required to complete:

#### Requirements:

<b>1. 4.0 credits in:</b>	<b>4.0</b>
ECON 6019 [0.5]	Mathematical Foundations for Economic Theory
ECON 6027 [0.5]	Econometrics II
ECON 6501 [0.5]	PhD Microeconomic Theory I
ECON 6502 [0.5]	PhD Microeconomic Theory II
ECON 6503 [0.5]	PhD Macroeconomic Theory I
ECON 6504 [0.5]	PhD Macroeconomics Theory II
ECON 6513 [0.5]	Second Year Research Paper
ECON 6514 [0.25]	Thesis Workshop I
ECON 6515 [0.25]	Thesis Workshop II
<b>2. 2.0 credits in ECON electives</b>	<b>2.0</b>
<b>3. 0.0 credits in:</b>	<b>0.0</b>
ECON 6909 [0.0]	Ph.D. Thesis
<b>Total Credits</b>	<b>6.0</b>

Students must pass the six first year core courses ECON 6019, ECON 6027, ECON 6501, ECON 6502, ECON 6503 and ECON 6504 within twelve months of beginning full time study. Should a student fail any of these courses they will be offered a supplemental exam in August of their first year in each course that they failed. Students who do not pass all of the six core first year courses or their supplemental exams within twelve months of beginning full time study will normally be withdrawn from the Ph.D. program.

Students must take 2.0 credits in ECON electives. Students will choose one primary field of specialization as listed below and must take at least 1.0 credit of their ECON electives in this primary field. Students wishing to take courses from outside those listed below as part of their 2.0 credits in ECON electives must first obtain permission from the department.

#### Econometrics

ECON 5712 [0.5]	Micro-Econometrics
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ECON 5713 [0.5]	Time-Series Econometrics
ECON 6714 [0.5]	Advanced Topics in Econometrics

#### Economic Development

ECON 5500 [0.5]	Development Economics I
ECON 5504 [0.5]	Development Economics II
ECON 5505 [0.5]	Selected Topics in Development Economics

#### Economics of the Environment

ECON 5803 [0.5]	Economics of Natural Resources
ECON 5804 [0.5]	Economics of the Environment
ECON 5805 [0.5]	Topics in Environmental and Resource Economics

#### Industrial Organization

ECON 5301 [0.5]	Industrial Organization I
ECON 5303 [0.5]	Industrial Organization II
ECON 5304 [0.5]	Topics in Industrial Organization

#### International Economics

ECON 5601 [0.5]	International Trade: Theory and Policy
ECON 5602 [0.5]	International Monetary Theory and Policy
ECON 5603 [0.5]	Topics in International Economics

#### Labour Economics

ECON 5361 [0.5]	Labour Economics I
ECON 5362 [0.5]	Labour Economics II
ECON 5363 [0.5]	Advanced Topics in Labour Economics

#### Monetary Economics

ECON 5606 [0.5]	Foundations of Monetary Economics
ECON 5607 [0.5]	Topics in Monetary Economics
ECON 5609 [0.5]	Explorations in Monetary Economics

#### Public Economics

ECON 5401 [0.5]	Public Economics: Expenditures
ECON 5402 [0.5]	Public Economics: Taxation
ECON 5403 [0.5]	Topics in the Theory of Public Economics

#### Second Year Paper

In the summer of their first year, students register in ECON 6513 Second Year Research Paper. Students who do not successfully complete ECON 6513 and 2.0 credits of Economics electives within 28 months of beginning full-time study will normally be withdrawn from the Ph.D. program.

#### Thesis Requirements

Doctoral students will write and defend a Ph.D. thesis. In preparing the thesis, the student is required to give two thesis workshops. In the first (ECON 6514), a research proposal for the thesis will be presented for evaluation by at least three faculty members. In the second (ECON 6515), a substantial portion of the research for the thesis will have been completed and will be presented. The student's progress will be evaluated by at least three faculty members.

## Guidelines for Completion of Ph.D. Degree

Consult the Graduate Regulations regarding time limits for completion of a PhD.

## Regulations

See the General Regulations section of this Calendar.

A grade of B- or higher must be received in each required core course in the M.A. program: ECON 5020, ECON 5021, ECON 5027, and ECON 5029. With respect to all other courses, a student may, with the recommendation of the Department and the approval of the Vice Provost (Graduate Studies), be allowed a grade of C+ in up to a maximum of 1.0 credit.

Students following the M.A.-M.B.A. dual pathway are governed by the academic regulations for the M.A. (above) and the M.B.A. For academic regulations concerning the M.B.A. [visit the Business programs section of this Calendar.](#)

## Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the M.A. Economics, including all concentrations and specializations, is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## Guidelines for Completion of Master's Degree

All approved elective courses will normally be taken at the 5000 level.

Full-time master's students are expected to complete their 4.0-credit requirements within two terms. Part-time students will take a minimum of five terms but must complete within an elapsed period of six calendar years, as set out in Section 13 of the General Regulations of this Calendar.

## Regulations

See the General Regulations section of this Calendar.

Doctoral students must normally obtain a grade of B- or higher in each credit counted towards the degree.

## Admission

The normal requirement for admission to the master's program is a B.A. (Honours) (or the equivalent) in Economics, with an average grade of B+ or higher.

Applicants to the M.A.-M.B.A. dual degree pathway must qualify for admission for both the M.A. Economics and the M.B.A. program. For admission information concerning the M.B.A., visit the Business section of this Calendar.

Applicants are expected to have had adequate preparation in microeconomic and macroeconomic theory, econometrics, and mathematics. This could be satisfied, for example, by having completed undergraduate

courses in advanced microeconomic theory, advanced macroeconomic theory, econometric theory and methods, mathematical analysis in economics, and statistical analysis in economics. Students with deficiencies in their preparation may have their program requirements extended accordingly.

**Post-Baccalaureate Diploma:** Applicants who lack the required undergraduate preparation may be admitted to the Post-Baccalaureate Diploma program in Economics designed to raise their standing to honours status. Refer to the Undergraduate Calendar for details about this program as well as the regulations governing it.

The Department may require certain applicants to write the Graduate Record Examination Aptitude Test and the Advanced Test in Economics offered by the Educational Testing Service.

Applicants whose first language is not English must certify adequate proficiency in English in one of the following ways:

- by presenting a CAEL overall band score of 70 or higher; or
- by presenting a TOEFL iBT total score of 100 or higher with a score of 24 or higher on each of the four (Listening, Reading, Writing, and Speaking) sections; or
- by presenting an IELTS overall band score of 7.0 or higher with a score of 6.5 or higher on each of the four (Listening, Reading, Writing, and Speaking) parts; or
- by having completed ESLA 1900 [1.0] at Carleton University with a final grade of B- or higher.

## Admission

The normal requirement for admission into the Ph.D. program is a master's degree (or the equivalent) from a recognized university with high honours standing. The Department may require certain applicants to write the Graduate Record Examination Aptitude Test and the Advanced Test in Economics offered by the Educational Testing Service.

In cases of exceptional merit, Ph.D. candidates may be accepted on a part-time basis.

## Transfer from Master's to Ph.D. Program

A student who achieves outstanding academic performance and demonstrates high promise for advanced research during the master's program may, with the permission of the Department, transfer into the Ph.D. program without completing the M.A. program if they have completed ECON 5020 (ECO 6120), ECON 5021 (ECO 6122), and ECON 5027 (ECO 5185) with an average grade of A or higher. Such students must take a total of at least eleven regular courses (M.A. and Ph.D. levels combined) and do not receive an M.A. degree. However, students who make the transfer and do not complete the Ph.D. can receive an M.A. by fulfilling all the requirements of the M.A. program.

## **Economics (ECON) Courses**

### **ECON 5020 [0.5 credit] (ECO 6122, ECO 6522)**

#### **Microeconomic Theory**

An introduction to graduate-level microeconomic theory, including topics such as utility maximization and individual choice, decision-making under uncertainty, producer theory (technology, costs, and profit maximization), alternative market structures (competition, monopoly, and oligopoly), general equilibrium, and the economics of information.

Precludes additional credit for ECON 5000 (no longer offered) and ECON 5001 (no longer offered).

### **ECON 5021 [0.5 credit] (ECO 6120, ECO 6520)**

#### **Macroeconomic Theory**

An introduction to graduate-level macroeconomic theory, including topics such as economic growth, consumption, investment, real and nominal frictions in the goods, labour, and credit markets, models of short-run economic fluctuations, and monetary and fiscal policy design.

Precludes additional credit for ECON 5002 (no longer offered).

### **ECON 5022 [0.5 credit]**

#### **Economic Theory for Financial Analysis**

Microeconomic theory and macroeconomic theory for financial analysis. Optimizing consumer and firm behaviour, consumption-based asset pricing, market structure, frictions in goods, labour and financial markets, business cycles and growth, monetary and fiscal policy.

Not open to students in the MA Economics program.

Prerequisite(s): enrolment in Master of Finance program.

### **ECON 5027 [0.5 credit] (ECO 5185, ECO 5585)**

#### **Econometrics I**

An introduction to econometrics at the graduate level. Topics include the analysis and treatment of univariate and multivariate regression models, GLS, IV, and maximum likelihood estimation, hypothesis testing, seemingly unrelated regression models, and simultaneous equations models, together with relevant economic applications. Precludes additional credit for ECON 5005 (no longer offered).

### **ECON 5029 [0.5 credit]**

#### **Methods of Economic Research**

Formulation, specification, and analysis of economic and econometric models; derivation of policy implications; communication of results and economic methodology.

Includes: Experiential Learning Activity

Precludes additional credit for ECON 5006 (no longer offered).

Prerequisite(s): ECON 5020 (ECON 5000 if taken before 2012-2013, ECON 5001 if taken before 2007-2008) and ECON 5027 (ECON 5005 if taken before 2012-2013), or permission of the Department.

### **ECON 5051 [0.5 credit]**

#### **Asset Pricing**

Value, the dynamic optimization problems of firms and investors, risk-neutral pricing, and related topics.

### **ECON 5052 [0.5 credit]**

#### **Financial Markets and Instruments**

Capital structure, debt financing, options, financial planning, corporate governance, and related topics.

### **ECON 5054 [0.5 credit]**

#### **Applied Financial Econometrics**

Statistical analysis and econometric techniques applied to financial data. Topics will include learning to use financial data, statistical diagnostics, forecasting, data mining for large data, asset allocation (copulas, GARCH, and DCC), hedging with derivatives, credit risk modeling, basic programming in Finance (Python or R).

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the M.Finance program. Not open to students in the M.A. Economics program.

### **ECON 5055 [0.5 credit]**

#### **Financial Econometrics**

The econometrics of empirical finance including parametric and nonparametric models of volatility, evaluation of asset-pricing theories, and models for risk management and transactions data.

Prerequisite(s): ECON 5027 (or equivalent).

### **ECON 5058 [0.5 credit]**

#### **Advanced Topics in Financial Economics**

Current research in financial economics. Topics may include theoretical analysis, quantitative methods, policy issues, and applications to the financial industry.

Prerequisite(s): ECON 5051 or ECON 5052, which may be taken concurrently with ECON 5058.

### **ECON 5060 [0.5 credit]**

#### **Economic Analysis of Public Policy**

How economic theory and empirical analysis are used to design and evaluate public policy, with emphasis on how the expectations, uncertainties, and practicalities faced by policymakers affect the design and implementation of economic policies.

**ECON 5061 [0.5 credit]****Central Banking: Monetary Policy Framework and Challenges**

The role of central banks in stabilizing the economy and keeping inflation low. Topics include conventional monetary policy, quantitative easing, forward guidance, and central bank communication, inflation targeting frameworks, financial stability risks, central bank digital currencies, and recent challenges in industrialized countries.

**ECON 5062 [0.5 credit]****Fiscal Policy in Canada: Practice and Challenges**

Examination of fiscal policy through an economic lens. Topics include the assessment of inputs (both analytical and political) into decision-making, fiscal multipliers, the importance of public communications, the role of federal-provincial relations, and the roles of the bureaucracy and the Cabinet.

**ECON 5063 [0.5 credit]****Innovation Policy and Economic Growth**

How innovation, technological progress and productivity drive the economic growth, prosperity and welfare of nations with particular attention to job creation and destruction, the financing of innovations including venture capital, private-public partnerships, public policies to promote innovation and green technologies.

**ECON 5064 [0.5 credit]****Economic Policy Formulation and Evaluation**

Formulation of policy paradigms based in economic theory and their application to various relevant and current policies, including those relating to social assistance, labour, tax expenditures, and the environment. Tools used for the evaluation of public, private, and non-profit projects and policies.

**ECON 5065 [0.5 credit]****Selected Topics in Economic Policy**

Overview of selected topics at the forefront of Economic Policy, including financial market regulation, competition policy of digital, healthcare, and labour markets, economics of pandemics and climate change, environmental justice, green finance and climate risk, artificial intelligence, data analytics, and machine learning, among others.

**ECON 5066 [0.5 credit]****Economic Policy and Indigenous Peoples**

The role of economic policy in affecting the welfare of Indigenous Peoples. Topics may include assessments of the economic well-being of Indigenous populations, the importance of the resolution of resource and land claims, and economic policies adopted by Indigenous governments.

**ECON 5209 [0.5 credit] (ECO 6106, ECO 6506)****Selected Topics in the History of Economic Thought**

The development of economic thought through time in relation to selected economic problems.

Precludes additional credit for ECON 5201 (no longer offered) and ECON 5202 (no longer offered).

Also offered at the undergraduate level, with different requirements, as ECON 4209, for which additional credit is precluded.

**ECON 5230 [0.5 credit]****Economic History**

The application of economic theory and quantitative techniques to selected topics in economic history, which may include historical patterns of growth and welfare, nineteenth-century globalization, technological change, the development of agriculture, industrialization, the Great Depression, and the origins of central banks.

Also offered at the undergraduate level, with different requirements, as ECON 4230, for which additional credit is precluded.

**ECON 5301 [0.5 credit] (ECO 6140, ECO 6540)****Industrial Organization I**

An examination of theories pertaining to industrial organization and their application by way of empirical studies. Topics include oligopoly theory, product differentiation, and strategic behaviour.

**ECON 5303 [0.5 credit] (ECO 6142, ECO 6542)****Industrial Organization II**

Regulation and competition policy as alternative approaches for influencing industry conduct and performance and correcting market failures. Topics may include incentive regulation under asymmetric information, cost-based pricing, second-best pricing, peak-load pricing, rate-of-return regulation, price-cap regulation, access pricing, and regulatory capture.

**ECON 5304 [0.5 credit] (ECO 6135, ECO 6535)****Topics in Industrial Organization**

Topics may include vertical restraints and vertical integration, innovation and research and development, network economics, contract theory, search theory and advertising, and industry studies.

**ECON 5361 [0.5 credit] (ECO 6191, ECO 6591)****Labour Economics I**

The application of microeconomic and macroeconomic theory to the labour market. Topics include labour supply and labour demand, wage determination, human capital, and the economics of education, and unemployment. Precludes additional credit for ECON 5360 (no longer offered) and ECON 5307 (no longer offered).

**ECON 5362 [0.5 credit] (ECO 6192, ECO 6592)**  
**Labour Economics II**

Personnel economics and contract theory. Topics include the economics of unions, discrimination, the economics of the household, gender and fertility, and labour mobility.

**ECON 5363 [0.5 credit] (ECO 6193, ECO 6593)**  
**Advanced Topics in Labour Economics**

Topics may include program evaluation, inequality, labour markets and health, labour markets and crime, and the structural estimation of labour market models. Precludes additional credit for ECON 5360 (no longer offered) and ECON 5307 (no longer offered).

**ECON 5401 [0.5 credit] (ECO 6130, ECO 6530)**  
**Public Economics: Expenditures**

The theory of public expenditures. Topics may include public goods and externalities, social insurance and redistribution, public provision of health care and education, public pension systems, and unemployment insurance.

**ECON 5402 [0.5 credit] (ECO 6131, ECO 6531)**  
**Public Economics: Taxation**

The study of tax systems. Concepts of equity and efficiency in taxation. The optimal design of tax structures using commodity, income, and capital taxes. Additional topics may include political economy of taxation, low-income support, environmental taxes, and tax evasion.

**ECON 5403 [0.5 credit] (ECO 6133, ECO 6533)**  
**Topics in the Theory of Public Economics**

Topics may include political economy, tax incidence in general equilibrium, the theory and practice of tax reform, normative approaches to income redistribution, the theory of non-market decision-making, the non-profit sector, and social choice theory.

**ECON 5460 [0.5 credit] (ECO 6174, ECO 6574)**  
**Health Economics**

Review of both classic and frontier work in the field of health and health care economics. Empirical work with an emphasis on theory and methodology. This course is also relevant to students interested in broader empirical microeconomic research.

**ECON 5462 [0.5 credit] (ECO 6174 )**  
**Selected Topics in Health Economics**

Selected topics in the economics of health and health care focusing on applications of theoretical and empirical tools to current issues in health economics. Prerequisite(s): enrolment in M.A. Economics.

**ECON 5500 [0.5 credit] (ECO 6170, ECO 6570)**  
**Development Economics I**

Topics at the forefront of development economics, combining theoretical and empirical analysis. Topics may include economic growth, firm behaviour, institutions, and political economy.

**ECON 5504 [0.5 credit] (ECO 6171, ECO 6571)**  
**Development Economics II**

A selection of topics currently at the forefront of research in development economics. Topics may include poverty and income distribution, labour markets, financial markets, and education.

**ECON 5505 [0.5 credit] (ECO 6172, ECO 6572)**  
**Selected Topics in Development Economics**

Overview of selected topics of current interest in the field of development economics from both a theoretical and empirical perspective.

**ECON 5507 [0.5 credit] (ECO 6173, ECO 6573)**  
**Environmental Aspects of Economic Development**

Policy aspects of sustainable economic development and environmental quality in developing countries. Topics may include energy use, deforestation, drought and desertification, depletion of natural resources, debt, environment and poverty, sustainable industrial and agricultural development, conservation policies, pollution control, and global environmental issues.

**ECON 5601 [0.5 credit] (ECO 6160, ECO 6560)**  
**International Trade: Theory and Policy**

International trade theory and its implications for economic policy, with emphasis on topics such as determinants of trade and specialization, gains from trade and commercial policy, international factor mobility, growth, and development.

**ECON 5602 [0.5 credit] (ECO 6161, ECO 6561)**  
**International Monetary Theory and Policy**

International monetary theory and its implications for economic policy, with emphasis on topics such as sources of equilibrium and disequilibrium in the balance of payments, balance-of-payments adjustment under fixed versus flexible exchange rates, international capital movements, and recent issues in the international monetary system.

**ECON 5603 [0.5 credit] (ECO 6162, ECO 6562)**  
**Topics in International Economics**

Selected topics in international economics, including theoretical analysis, quantitative methods, and policy formulation, implementation, and evaluation.

**ECON 5606 [0.5 credit] (ECO 6180, ECO 6580)**  
**Foundations of Monetary Economics**

Microeconomic foundations of monetary theory. Alternative theories of the existence of money and the micro-foundations for how money is integrated into aggregate macroeconomic models.

**ECON 5607 [0.5 credit] (ECO 6181, ECO 6581)**  
**Topics in Monetary Economics**

Coverage of one or more areas of current research on the frontiers of monetary economics.

**ECON 5608 [0.5 credit] (ECO 6182, ECO 6582)**  
**Monetary Economics and Financial Intermediation**

The evolution of the financial system and its interrelationship with the money supply process. Monetary and finance theory and empirical research applied to institutional problems in both historical and contemporary settings. Topics may include credit markets, financial instability, bubbles, and links to central bank policy.

**ECON 5609 [0.5 credit] (ECO 6183, ECO 6583)**  
**Explorations in Monetary Economics**

Explorations in the theory, policy and empirics of monetary economics.

**ECON 5708 [0.5 credit]**  
**Economic Data Science - Analytics**

An introduction to methods of statistical and machine learning analytics for economic analysis. Tools relevant for both small and large data sets will be covered. Topics may include approaches to classification, dimension reduction strategies, and prediction models and tools.

Includes: Experiential Learning Activity  
Also offered at the undergraduate level, with different requirements, as ECON 4708, for which additional credit is precluded.

**ECON 5709 [0.5 credit]**  
**Economic Data Science - Applications**

Application of data science and machine learning methods to real-world economic problems. Students will apply their data science knowledge in hands-on projects to answer topical research questions. This course has a strong practical focus.

Includes: Experiential Learning Activity  
Prerequisite(s): ECON 5708 with a grade of C+ or higher.  
Also offered at the undergraduate level, with different requirements, as ECON 4709, for which additional credit is precluded.

**ECON 5712 [0.5 credit] (ECO 6175, ECO 6575)**  
**Micro-Econometrics**

Analysis of the concepts and tools used in micro-econometrics with particular focus on empirical applicability. Topics may include discrete choice models, limited dependent variables, panel data, duration models, and program evaluation, together with relevant economic applications.

Precludes additional credit for ECON 5702 (no longer offered).

Prerequisite(s): ECON 5027 (or equivalent), or permission of the Department.

**ECON 5713 [0.5 credit] (ECO 6176, ECO 6576)**  
**Time-Series Econometrics**

Analysis of the concepts and tools used in time-series econometrics with particular focus on empirical applicability. Topics may include cointegration analysis, error-correction models, VAR models, volatility analysis, and non-linear time-series models, together with relevant economic applications.

Precludes additional credit for ECON 5703 (no longer offered).

Prerequisite(s): ECON 5027 (or equivalent), or permission of the Department.

**ECON 5803 [0.5 credit] (ECO 6143, ECO 6543)**  
**Economics of Natural Resources**

The concept of scarcity rents in static and dynamic settings. Basic property regimes: open access, exclusive access and common property. Policy instruments. The importance of transaction costs. General-equilibrium and political-economic aspects of property regimes. Conflict. Elements of dynamic optimization. Renewable and non-renewable resources.

Precludes additional credit for ECON 5305 (no longer offered).

**ECON 5804 [0.5 credit] (ECO 6151, ECO 6551)**  
**Economics of the Environment**

Theory of environmental regulation, including command and control, incentive based mechanisms, effects of market structure, and interactions with pre-existing taxes. Valuation of non-marketed goods, including existence value, contingent valuation, hedonic price methods, health impacts, irreversibility, and recreational benefits.

Precludes additional credit for ECON 5306 (no longer offered).

**ECON 5805 [0.5 credit] (ECO 6134, ECO 6534)****Topics in Environmental and Resource Economics**

Topics may include: international dimensions of environmental regulation, including treaties, competitiveness, and the effects of trade liberalization; development issues, including fiscal sustainability, Dutch disease, the resource curse, and population growth; resource topics, including optimal taxation, green national accounts, sustainability theory, and scarcity of extractive resources.

**ECON 5880 [0.5 credit]****Special Topics**

Topics may vary from year to year and are announced in advance of the registration period.

Prerequisite(s): permission of the Department.

**ECON 5902 [0.5 credit]****Internship Placement**

Internship students are required to register in this course during their work term.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**ECON 5906 [0.5 credit]****Directed Research**

A substantial research paper is required of any student enrolled in this course, which is designed to facilitate the pursuit of research on a topic chosen in consultation with a faculty member and the relevant Graduate Supervisor.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**ECON 5909 [1.5 credit]****M.A. Thesis**

Includes: Experiential Learning Activity

Prerequisite(s): At least A- in each of ECON 5020, ECON 5021, and ECON 5027, and approval of the Department.

**ECON 6019 [0.5 credit] (ECO 7119)****Mathematical Foundations for Economic Theory**

Mathematical techniques needed to understand micro- and macro-economic theory at the Ph.D. level, and to carry out research. Real analysis. Review of static optimization. Continuous- and discrete-time dynamic optimization in deterministic and stochastic environments.

Applications to economic theory are presented.

Includes: Experiential Learning Activity

Prerequisite(s): ECON 5020 (or equivalent) and ECON 5021 (or equivalent), or permission of the Department.

**ECON 6027 [0.5 credit] (ECO 7126, ECO 7526)****Econometrics II**

Statistical foundations of econometrics: estimation, inference, and decision theory. Topics may include likelihood and moment-based inference, asymptotic theory, semi-parametric and non-parametric models, Bayesian approaches, and structural models, together with relevant economic applications.

Includes: Experiential Learning Activity

Precludes additional credit for ECON 5701 (no longer offered) and ECON 6005 (no longer offered).

Prerequisite(s): ECON 5027 (or equivalent).

**ECON 6501 [0.5 credit]****PhD Microeconomic Theory I**

Topics include demand, production, general equilibrium, and welfare economics.

Precludes additional credit for ECON 6020 (no longer offered).

**ECON 6502 [0.5 credit]****PhD Microeconomic Theory II**

Topics may include game theory, information economics, externalities and public goods.

Precludes additional credit for ECON 6020 (no longer offered).

**ECON 6503 [0.5 credit]****PhD Macroeconomic Theory I**

Analysis of dynamic macroeconomic systems, with applications to economic growth. Micro-foundations of modern macroeconomics, with a focus on solving dynamic optimization problems and applied to consumption, portfolio, and investment decisions, and to micro-founded growth models.

Precludes additional credit for ECON 6021 (no longer offered).

**ECON 6504 [0.5 credit]****PhD Macroeconomics Theory II**

Modern dynamic stochastic general equilibrium models, such as real-business-cycle models, models of labour-market and financial frictions, and heterogeneous-agent models. Students also learn computational techniques to solve and estimate these models.

Precludes additional credit for ECON 6021 (no longer offered).

**ECON 6513 [0.5 credit]****Second Year Research Paper**

This course aids the transition to the research phase of the program. Students complete a research paper and formally present this paper in a departmental workshop.

Includes: Experiential Learning Activity

**ECON 6514 [0.25 credit]**  
**Thesis Workshop I**

Students present a research proposal that includes an advanced draft of a substantive chapter of their thesis for evaluation by at least three faculty members.

Includes: Experiential Learning Activity

Prerequisite(s): ECON 6013.

**ECON 6515 [0.25 credit]**  
**Thesis Workshop II**

Students present a substantial portion of their thesis for evaluation by at least three faculty members. This must include a revised draft of their first substantive chapter of their thesis, and an advanced draft of their second substantive chapter.

Includes: Experiential Learning Activity

Prerequisite(s): ECON 6014.

**ECON 6714 [0.5 credit] (ECO 7177, ECO 7577)**  
**Advanced Topics in Econometrics**

Coverage of one or more areas of current econometric research.

Prerequisite(s): ECON 6027 (ECON 6005 if taken before 2012-2013).

**ECON 6904 [0.5 credit] (ECO 7980)**  
**Directed Readings**

This course is designed to permit students to pursue research on topics chosen in consultation with faculty members and the Ph.D. Supervisor.

Prerequisite(s): permission of the Department.

**ECON 6907 [0.5 credit] (ECO 7002)**  
**Thesis Workshop I**

Includes: Experiential Learning Activity

**ECON 6908 [0.5 credit] (ECO 7004)**  
**Thesis Workshop II**

Includes: Experiential Learning Activity

**ECON 6909 [0.0 credit] (ECO 9999)**  
**Ph.D. Thesis**

Includes: Experiential Learning Activity

## Electrical and Computer Engineering

This section presents the requirements for programs in:

- **M.A.Sc. Electrical and Computer Engineering**
- **M.Eng. Electrical and Computer Engineering**
- **M.A.Sc. Electrical and Computer Engineering with Concentration in Modeling and Simulation**
- **M.Eng. Electrical and Computer Engineering with Concentration in Modeling and Simulation**
- **M.A.Sc. Electrical and Computer Engineering with Concentration in Software Engineering**
- **M.Eng. Electrical and Computer Engineering with Concentration in Software Engineering**
- **M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Climate Change**
- **M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Climate Change**
- **M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Cybersecurity**
- **M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Cybersecurity**
- **M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Data Science**
- **M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Data Science**
- **Cooperative Master's Degree**
- **Ph.D. Electrical and Computer Engineering**
- **Ph.D. Electrical and Computer Engineering with Concentration in Software Engineering**

### Program Requirements

Subject to the approval of the departmental chair, a student may take up to half of the course credits in the program in other disciplines (e.g., Mathematics, Computer Science, Physics).

Master's programs with a thesis earn the Master of Applied Science degree, while other master's programs earn the Master of Engineering degree.

### M.A.Sc. Electrical and Computer Engineering (5.0 credits)

#### Requirements:

1. 2.5 credits in courses	2.5
2. 2.5 credits in Thesis	2.5
<b>Total Credits</b>	<b>5.0</b>

### M.Eng. Electrical and Computer Engineering (4.5 credits)

#### Requirements - by project:

1. 0.5 credit in:	0.5
SYSC 5902 [0.5]    Research Methods for Engineers	
2. 0.5 credit in project	0.5
3. 3.5 credits in courses, which may include up to an additional 0.5 credit in project	3.5
<b>Total Credits</b>	<b>4.5</b>

#### Requirements - by coursework:

1. 0.5 credit in:	0.5
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SYSC 5902 [0.5]	Research Methods for Engineers	
<b>2. 4.0 credits in courses</b>		<b>4.0</b>
<b>Total Credits</b>		<b>4.5</b>

### **M.A.Sc. Electrical and Computer Engineering with Concentration in Modeling and Simulation (5.0 credits)**

#### **Requirements - by thesis (5.0 credits)**

<b>1. 1.5 credits from</b> modeling and simulation core courses:		<b>1.5</b>
SYSC 5001 [0.5]	Simulation and Modeling	
SYSC 5004 [0.5]	Optimization for Engineering Applications	
SYSC 5101 [0.5]	Design of High Performance Software	
SYSC 5103 [0.5]	Software Agents	
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5207 [0.5]	Distributed Systems Engineering	
SYSC 5405 [0.5]	Pattern Classification and Experiment Design	
SYSC 5703 [0.5]	Integrated Database and Cloud Systems	
<b>2. 1.0 credit in courses</b>		<b>1.0</b>
<b>3. 2.5 credits in:</b>		<b>2.5</b>
SYSC 5909 [2.5]	M.A.Sc. Thesis (in the area of modeling and simulation)	
<b>Total Credits</b>		<b>5.0</b>

### **M.Eng. Electrical and Computer Engineering with Concentration in Modeling and Simulation (4.5 credits)**

#### **Requirements - by project**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
SYSC 5902 [0.5]	Research Methods for Engineers	
<b>2. 0.5 credit in project:</b>		<b>0.5</b>
SYSC 5900 [0.5]	Systems Engineering Project (in the area of modeling and simulation)	
<b>3. 2.0 credits from</b> modeling and simulation core courses:		<b>2.0</b>
SYSC 5001 [0.5]	Simulation and Modeling	
SYSC 5004 [0.5]	Optimization for Engineering Applications	
SYSC 5101 [0.5]	Design of High Performance Software	
SYSC 5103 [0.5]	Software Agents	
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5207 [0.5]	Distributed Systems Engineering	
SYSC 5405 [0.5]	Pattern Classification and Experiment Design	
SYSC 5703 [0.5]	Integrated Database and Cloud Systems	
<b>4. 1.5 credits in courses</b> , which may include up to an additional 0.5 credit in project		<b>1.5</b>
<b>Total Credits</b>		<b>4.5</b>
<b>Requirements - by coursework:</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>

SYSC 5902 [0.5]	Research Methods for Engineers	
<b>2. 2.0 credits from</b> modeling and simulation core courses:		<b>2.0</b>
SYSC 5001 [0.5]	Simulation and Modeling	
SYSC 5004 [0.5]	Optimization for Engineering Applications	
SYSC 5101 [0.5]	Design of High Performance Software	
SYSC 5103 [0.5]	Software Agents	
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5207 [0.5]	Distributed Systems Engineering	
SYSC 5405 [0.5]	Pattern Classification and Experiment Design	
SYSC 5703 [0.5]	Integrated Database and Cloud Systems	
<b>3. 2.0 credits in courses</b>		<b>2.0</b>
<b>Total Credits</b>		<b>4.5</b>

### **M.A.Sc. Electrical and Computer Engineering with Concentration in Software Engineering (5.0 credits)**

#### **Requirements - thesis pathway:**

<b>1. 1.5 credits from Software Engineering core:</b>		<b>1.5</b>
SYSC 5001 [0.5]	Simulation and Modeling	
SYSC 5004 [0.5]	Optimization for Engineering Applications	
SYSC 5101 [0.5]	Design of High Performance Software	
SYSC 5103 [0.5]	Software Agents	
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5105 [0.5]	Software Quality Engineering and Management	
SYSC 5206 [0.5]	Resource Management on Distributed Systems	
SYSC 5207 [0.5]	Distributed Systems Engineering	
SYSC 5500 [0.5]	Designing Secure Networking and Computer Systems	
SYSC 5701 [0.5]	Operating System Methods for Real-Time Applications	
SYSC 5703 [0.5]	Integrated Database and Cloud Systems	
SYSC 5708 [0.5]	Model-Driven Development of Real-Time and Distributed Software	
SYSC 5709 [0.5]	Advanced Topics in Software Engineering	
SYSC 5805 [0.5]	Model-Driven Security Engineering	
SYSC 5807 [0.5]	Advanced Topics in Computer Systems	
SYSC 5809 [0.5]	The Internet of Things	
<b>2. 1.0 credit in courses</b>		<b>1.0</b>
<b>3. 2.5 credits in:</b>		<b>2.5</b>
SYSC 5909 [2.5]	M.A.Sc. Thesis (Thesis must be in the area of Software Engineering. Each candidate submitting a thesis will be required to undertake an oral defence of the thesis.)	
<b>Total Credits</b>		<b>5.0</b>

## M.Eng. Electrical and Computer Engineering with Concentration in Software Engineering (4.5 credits)

### Requirements (by coursework):

<b>1. 0.5 credit in:</b>	<b>0.5</b>
SYSC 5902 [0.5]	Research Methods for Engineers
<b>2. 2.0 credits from software engineering core courses:</b>	<b>2.0</b>
SYSC 5001 [0.5]	Simulation and Modeling
SYSC 5004 [0.5]	Optimization for Engineering Applications
SYSC 5101 [0.5]	Design of High Performance Software
SYSC 5103 [0.5]	Software Agents
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation
SYSC 5105 [0.5]	Software Quality Engineering and Management
SYSC 5206 [0.5]	Resource Management on Distributed Systems
SYSC 5207 [0.5]	Distributed Systems Engineering
SYSC 5500 [0.5]	Designing Secure Networking and Computer Systems
SYSC 5701 [0.5]	Operating System Methods for Real-Time Applications
SYSC 5703 [0.5]	Integrated Database and Cloud Systems
SYSC 5708 [0.5]	Model-Driven Development of Real-Time and Distributed Software
SYSC 5709 [0.5]	Advanced Topics in Software Engineering
SYSC 5805 [0.5]	Model-Driven Security Engineering
SYSC 5807 [0.5]	Advanced Topics in Computer Systems
SYSC 5809 [0.5]	The Internet of Things
<b>3. 2.0 credits in courses</b>	<b>2.0</b>
<b>Total Credits</b>	<b>4.5</b>

### Requirements (by project):

<b>1. 0.5 credit in:</b>	<b>0.5</b>
SYSC 5902 [0.5]	Research Methods for Engineers
<b>2. 0.5 credit in:</b>	<b>0.5</b>
SYSC 5900 [0.5]	Systems Engineering Project in the area of Software Engineering
<b>3. 2.0 credits from software engineering core courses:</b>	<b>2.0</b>
SYSC 5001 [0.5]	Simulation and Modeling
SYSC 5004 [0.5]	Optimization for Engineering Applications
SYSC 5101 [0.5]	Design of High Performance Software
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation
SYSC 5105 [0.5]	Software Quality Engineering and Management
SYSC 5206 [0.5]	Resource Management on Distributed Systems
SYSC 5207 [0.5]	Distributed Systems Engineering
SYSC 5500 [0.5]	Designing Secure Networking and Computer Systems
SYSC 5701 [0.5]	Operating System Methods for Real-Time Applications

SYSC 5703 [0.5]	Integrated Database and Cloud Systems
SYSC 5708 [0.5]	Model-Driven Development of Real-Time and Distributed Software
SYSC 5709 [0.5]	Advanced Topics in Software Engineering
SYSC 5805 [0.5]	Model-Driven Security Engineering
SYSC 5807 [0.5]	Advanced Topics in Computer Systems
SYSC 5809 [0.5]	The Internet of Things
<b>4. 1.5 credits in courses, which may include up to an additional 0.5 credits in project in the area of Software Engineering</b>	<b>1.5</b>
<b>Total Credits</b>	<b>4.5</b>

## M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Climate Change (5.0 credits)

### Requirements:

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration
<b>2. 0.0 credit in:</b>	<b>0.0</b>
CLIM 5800 [0.0]	Climate Seminar Series
<b>3. 1.5 credits in courses</b>	<b>1.5</b>
<b>4. 2.5 credits in:</b>	<b>2.5</b>
SYSC 5909 [2.5]	M.A.Sc. Thesis (in the area of climate change)
<b>Total Credits</b>	<b>5.0</b>

## M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Climate Change (4.5 credits)

### Requirements - project pathway (4.5 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration
<b>2. 0.0 credit in:</b>	<b>0.0</b>
CLIM 5800 [0.0]	Climate Seminar Series
<b>3. 0.5 credit in:</b>	<b>0.5</b>
ELEC 5302 [0.5]	Renewable and Distributed Energy Resource Technologies
SERG 5001 [0.5]	Sustainable Energy Policy for Engineers
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation
or approved Advanced Topic in the area of climate change	
<b>4. 2.5 credits in courses</b>	<b>2.5</b>
<b>5. 0.5 credit in:</b>	<b>0.5</b>
SYSC 5900 [0.5]	Systems Engineering Project (in the area of climate change)
<b>Total Credits</b>	<b>4.5</b>

### Requirements - coursework pathway (4.5 credits)

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration
<b>2. 0.0 credit in:</b>	<b>0.0</b>
CLIM 5800 [0.0]	Climate Seminar Series
<b>3. 0.5 credit in:</b>	<b>0.5</b>

ELEC 5302 [0.5]	Renewable and Distributed Energy Resource Technologies	
SERG 5001 [0.5]	Sustainable Energy Policy for Engineers	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	
or approved Advanced Topic in the area of climate change		
<b>4. 3.0 credits in courses</b>		<b>3.0</b>
<b>Total Credits</b>		<b>4.5</b>

### **M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Cybersecurity (5.0 credits)**

#### **Requirements:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>3. 1.5 credits in courses</b>		<b>1.5</b>
<b>4. 2.5 credits in:</b>		<b>2.5</b>
SYSC 5909 [2.5]	M.A.Sc. Thesis (in the area of cybersecurity)	
<b>Total Credits</b>		<b>5.0</b>

### **M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Cybersecurity (4.5 credits)**

#### **Requirements - project pathway (4.5 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
SYSC 5902 [0.5]	Research Methods for Engineers	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>4. 2.5 credits in courses</b>		<b>2.5</b>
<b>5. 0.5 credit in:</b>		<b>0.5</b>
SYSC 5900 [0.5]	Systems Engineering Project (in the area of cybersecurity)	
<b>Total Credits</b>		<b>4.5</b>

#### **Requirements - coursework pathway (4.5 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
SYSC 5902 [0.5]	Research Methods for Engineers	
<b>1. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>4. 3.0 credits in courses, including 0.5 credit in approved elective in the area of the specialization</b>		<b>3.0</b>
<b>Total Credits</b>		<b>4.5</b>

### **M.A.Sc. Electrical and Computer Engineering with Collaborative Specialization in Data Science (5.0 credits)**

#### **Requirements - by Thesis (5.0 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 0.5 credit from data science elective courses:</b>		<b>0.5</b>
SYSC 5001 [0.5]	Simulation and Modeling	

SYSC 5004 [0.5]	Optimization for Engineering Applications	
SYSC 5101 [0.5]	Design of High Performance Software	
SYSC 5103 [0.5]	Software Agents	
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5201 [0.5]	Computer Communication	
SYSC 5207 [0.5]	Distributed Systems Engineering	
SYSC 5303 [0.5]	Interactive Networked Systems and Telemedicine	
SYSC 5306 [0.5]	Mobile Computing Systems	
SYSC 5401 [0.5]	Adaptive and Learning Systems	
SYSC 5405 [0.5]	Pattern Classification and Experiment Design	
SYSC 5407 [0.5]	Planning and Design of Computer Networks	
SYSC 5500 [0.5]	Designing Secure Networking and Computer Systems	
SYSC 5703 [0.5]	Integrated Database and Cloud Systems	
<b>3. 1.5 credits in courses</b>		<b>1.5</b>
<b>4. 2.5 credits in:</b>		<b>2.5</b>
SYSC 5909 [2.5]	M.A.Sc. Thesis	
in the area of data science (each candidate submitting a thesis will be required to undertake an oral defence of the thesis)		
<b>Total Credits</b>		<b>5.0</b>

### **M.Eng. Electrical and Computer Engineering with Collaborative Specialization in Data Science (4.5 credits)**

#### **Requirements - by Project (4.5 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.0 credit from data science elective courses:</b>		<b>1.0</b>
SYSC 5001 [0.5]	Simulation and Modeling	
SYSC 5004 [0.5]	Optimization for Engineering Applications	
SYSC 5101 [0.5]	Design of High Performance Software	
SYSC 5103 [0.5]	Software Agents	
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5201 [0.5]	Computer Communication	
SYSC 5207 [0.5]	Distributed Systems Engineering	
SYSC 5303 [0.5]	Interactive Networked Systems and Telemedicine	
SYSC 5306 [0.5]	Mobile Computing Systems	
SYSC 5401 [0.5]	Adaptive and Learning Systems	
SYSC 5405 [0.5]	Pattern Classification and Experiment Design	
SYSC 5407 [0.5]	Planning and Design of Computer Networks	
SYSC 5500 [0.5]	Designing Secure Networking and Computer Systems	
SYSC 5703 [0.5]	Integrated Database and Cloud Systems	
<b>3. 2.5 credits in courses, which may include up to an additional 0.5 credit in project</b>		<b>2.5</b>

<b>4. 0.5 credit in:</b>	0.5
SYSC 5900 [0.5] Systems Engineering Project in the area of data science	
<b>Total Credits</b>	<b>4.5</b>

#### Requirements - by Coursework (4.5 credits)

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5] Introduction to Data Science	
<b>2. 1.5 credits from data science elective courses:</b>	1.5
SYSC 5001 [0.5] Simulation and Modeling	
SYSC 5004 [0.5] Optimization for Engineering Applications	
SYSC 5101 [0.5] Design of High Performance Software	
SYSC 5103 [0.5] Software Agents	
SYSC 5104 [0.5] Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5201 [0.5] Computer Communication	
SYSC 5207 [0.5] Distributed Systems Engineering	
SYSC 5303 [0.5] Interactive Networked Systems and Telemedicine	
SYSC 5306 [0.5] Mobile Computing Systems	
SYSC 5401 [0.5] Adaptive and Learning Systems	
SYSC 5405 [0.5] Pattern Classification and Experiment Design	
SYSC 5407 [0.5] Planning and Design of Computer Networks	
SYSC 5500 [0.5] Designing Secure Networking and Computer Systems	
SYSC 5703 [0.5] Integrated Database and Cloud Systems	
<b>3. 0.5 credit in:</b>	0.5
SYSC 5902 [0.5] Research Methods for Engineers	
<b>4. 2.0 credits in courses</b>	2.0
<b>Total Credits</b>	<b>4.5</b>

#### Cooperative Master's Degree (5.0 credits)

Participation in the Cooperative Master's program is subject to acceptance by a suitable sponsoring organization.

#### Requirements - by thesis

<b>1. 3.0 credits in courses</b>	3.0
<b>2. 2.0 credits in Thesis</b>	2.0
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - by project

<b>1. 4.0 credits in courses</b>	4.0
<b>2. 1.0 credit in two 0.5-credit projects (Each project conducted in one of two work terms)</b>	1.0
<b>Total Credits</b>	<b>5.0</b>

#### Ph.D. Electrical and Computer Engineering (1.5 credits)

Subject to the approval of the advisory committee, a student may take up to half of the course credits in the program in other disciplines (e.g., Mathematics, Computer Science, Physics).

#### Requirements:

<b>1. 1.5 credits in courses</b>	1.5
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2. A comprehensive examination involving written and oral examinations and a written thesis proposal, to take place before the end of the fourth term of registration

<b>3. 0.0 credits in a thesis which must be defended at an oral examination</b>	0.0
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<b>Total Credits</b>	<b>1.5</b>
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#### Ph.D. Electrical and Computer Engineering with Concentration in Software Engineering (1.5 credits)

#### Requirements:

<b>1. 1.0 credit from software engineering core courses:</b>	1.0
SYSC 5001 [0.5] Simulation and Modeling	
SYSC 5004 [0.5] Optimization for Engineering Applications	
SYSC 5101 [0.5] Design of High Performance Software	
SYSC 5103 [0.5] Software Agents	
SYSC 5104 [0.5] Methodologies For Discrete-Event Modeling And Simulation	
SYSC 5105 [0.5] Software Quality Engineering and Management	
SYSC 5206 [0.5] Resource Management on Distributed Systems	
SYSC 5207 [0.5] Distributed Systems Engineering	
SYSC 5500 [0.5] Designing Secure Networking and Computer Systems	
SYSC 5701 [0.5] Operating System Methods for Real-Time Applications	
SYSC 5703 [0.5] Integrated Database and Cloud Systems	
SYSC 5708 [0.5] Model-Driven Development of Real-Time and Distributed Software	
SYSC 5709 [0.5] Advanced Topics in Software Engineering	
SYSC 5805 [0.5] Model-Driven Security Engineering	
SYSC 5807 [0.5] Advanced Topics in Computer Systems	
SYSC 5809 [0.5] The Internet of Things	

<b>2. 0.5 credit in courses</b>	0.5
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**3. 0.0 credit in comprehensive examination (one topic of which must be in the area of software engineering)**

<b>4. 0.0 credits in:</b>	0.0
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SYSC 6909 [0.0] Ph.D. Thesis (Thesis must be in the area of Software Engineering. Each candidate submitting a thesis will be required to undertake an oral defence of the thesis.)	
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<b>Total Credits</b>	<b>1.5</b>
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#### Graduate Courses

In all programs, the student may choose graduate courses from either university with the approval of the adviser or advisory committee. Course descriptions may be found in the departmental section of the calendar. All courses are of one term duration. Only a selection of courses listed is given in a particular academic year. The following codes identify the department offering the course.

## Carleton University

- ELEC Department of Electronics
- SYSC Department of Systems and Computer Engineering

## University of Ottawa

- EACJ School of Electrical Engineering and Computer Science

### Course List by Research Area

#### BIOMEDICAL ENGINEERING

##### Systems and Computer Engineering (Carleton)

SYSC 5301 (ELG 6131)	Advanced Topics in Biomedical Engineering
SYSC 5302 (ELG 6321)	Biomedical Instrumentation
SYSC 5303 (ELG 6133)	Interactive Networked Systems and Telemedicine
SYSC 5304 (ELG 5127)	Medical Imaging Modalities
SYSC 5307 (ELG 6307)	Biological Signals

#### COMPUTER AIDED DESIGN FOR ELECTRONIC CIRCUITS

##### Department of Electronics (Carleton)

ELEC 5401 (ELG 6341)	Signal Integrity in High-Speed Designs: Modeling and Analysis
ELEC 5402 (ELG 6342)	Introduction to Electronic Design Automation Algorithms and Techniques
ELEC 5404 (ELG 6344)	Neural Networks for High-Speed/High-Frequency Circuit Design
ELEC 5405 (ELG 6340)	Advanced Linear and Nonlinear Circuit Theory and Applications
ELEC 5504 (ELG 6354)	Analysis of High-Speed Electronic Packages and Interconnects
ELEC 5506 (ELG 6356)	Simulation and Optimization of Electronic Circuits
ELEC 5508 (ELG 6358)	Advanced Methods for Simulation of Large-Scale Circuits and Systems
ELEC 5704 (ELG 6374)	Advanced Topics in CAD
ELEC 5803 (ELG 6383)	Behavioural Synthesis of ICs

##### School of Electrical Engineering and Computer Science (Ottawa)

EACJ 5705 (ELG 5195)	Digital Logic Design
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#### COMPUTER AND SOFTWARE ENGINEERING

##### Systems and Computer Engineering (Carleton)

SYSC 5101 (ELG 6111)	Design of High Performance Software
SYSC 5103 (ELG 6113)	Software Agents
SYSC 5104 (ELG 6114)	Methodologies For Discrete-Event Modeling And Simulation
SYSC 5105 (ELG 6115)	Software Quality Engineering and Management
SYSC 5108 (ELG 6118)	Topics in Information Systems

SYSC 5701 (CSI 5117)	Operating System Methods for Real-Time Applications
SYSC 5703 (ELG 6173)	Integrated Database and Cloud Systems
SYSC 5704 (ELG 6174)	Elements of Computer Systems
SYSC 5708 (ELG 6178)	Model-Driven Development of Real-Time and Distributed Software
SYSC 5709 (ELG 6179)	Advanced Topics in Software Engineering
SYSC 5807 (ELG 6187)	Advanced Topics in Computer Systems

##### School of Electrical Engineering and Computer Science (Ottawa)

EACJ 5100 (ELG 5200)	Machine Vision
EACJ 5203 (ELG 5191)	Distributed System Software
EACJ 5204 (ELG 5124)	Virtual Environments
EACJ 5205 (ELG 5125)	Quality Service Mgmt/Multimed
EACJ 5703 (ELG 5194)	Reliable Digital Systems
EACJ 5705 (ELG 5195)	Digital Logic Design
EACJ 5807 (ELG 7186)	Topics in Computers I
EACJ 5808 (ELG 7187)	Topics in Computers II
EACJ 5900 (ELG 7573)	Sujets choisis sur les ordinat

#### COMPUTER COMMUNICATIONS, DISTRIBUTED SYSTEMS, AND MULTIMEDIA

##### Systems and Computer Engineering (Carleton)

SYSC 5201 (ELG 6121)	Computer Communication
SYSC 5207 (ELG 6127)	Distributed Systems Engineering
SYSC 5306 (ELG 6136)	Mobile Computing Systems
SYSC 5403 (ELG 6143)	Network Access Techniques
SYSC 5407 (ELG 5137)	Planning and Design of Computer Networks
SYSC 5408	Cross Layer Design for Wireless Networks
SYSC 5500 (ELG 6189)	Designing Secure Networking and Computer Systems
SYSC 5502 (ELG 6152)	Advanced Linear Systems
SYSC 5801 (ELG 6181)	Advanced Topics in Computer Communications

##### School of Electrical Engineering and Computer Science (Ottawa)

EACJ 5009 (ELG 5383)	Survivable Optical Networks
EACJ 5104 (ELG 5199)	Distributed Database Systems
EACJ 5108 (ELG 5382)	Switching and Traffic Theory

EACJ 5200 (ELG 5120)	Queuing Systems
EACJ 5202 (ELG 5122)	Analysis/Perf Eval: Comp Comm
EACJ 5206 (ELG 5126)	Source Coding and Data Compress.
EACJ 5208 (ELG 7185)	Wireless Ad Hoc Networking
EACJ 5500 (ELG 5371)	Digital Comm by Satellite
EACJ 5605 (ELG 7177)	Topics in Communications I
EACJ 5606 (ELG 7178)	Topics in Communications II
EACJ 5607 (ELG 5374)	Computer-Communication Network
EACJ 5369 (ELG 5396)	Internetworking Technologies
EACJ 5384/ COMP 5406 [0.5] (ELG 5384,CSI 5105,LEG 5384)	Network Security and Cryptography

#### **DIGITAL AND OPTICAL COMMUNICATIONS**

##### **Department of Electronics (Carleton)**

ELEC 5605 (ELG 6365)	Optical Fibre Communications
ELEC 5606 (ELG 6366)	Phase-Locked Loops and Receiver Synchronizers

##### **Systems and Computer Engineering (Carleton)**

SYSC 5200 (ELG 6120)	Algebraic Coding Theory
SYSC 5503 (ELG 6153)	Stochastic Processes
SYSC 5504 (ELG 6154)	Principles of Digital Communication
SYSC 5506 (ELG 5170)	Information Theory
SYSC 5605 (ELG 6165)	Advanced Digital Communication
SYSC 5606 (ELG 6166)	Introduction to Mobile Communications
SYSC 5607 (ELG 6167)	Source Coding and Data Compression
SYSC 5608 (ELG 6168)	Wireless Communications Systems
SYSC 5804 (ELG 6184)	Advanced Topics in Communications Systems

##### **School of Electrical Engineering and Computer Science (Ottawa)**

EACJ 5003 (ELG 5106)	Fourier Optics
EACJ 5105 (ELG 5373)	Secure Comm and Data Encryption
EACJ 5109 (ELG 5119)	Stochastic Processes
EACJ 5131 (ELG 5131)	Topics in Electromagnetics
EACJ 5132 (ELG 5132)	Smart Antennas
EACJ 5133 (ELG 5133)	Intro to Mobile Communications

EACJ 5300 (ELG 7114)	Topics in Systems and Control II
EACJ 5301 (ELG 7574)	Sujets choisis en systemes
EACJ 5360 (ELG 5360)	Digital Watermarking
EACJ 5501 (ELG 5170)	Information Theory
EACJ 5503 (ELG 5179)	Detection and Estimation
EACJ 5504 (ELG 5372)	Error Control Coding
EACJ 5506 (ELG 5375)	Principles of Digital Comm
EACJ 5605 (ELG 7177)	Topics in Communications I
EACJ 5606 (ELG 7178)	Topics in Communications II
EACJ 5702 (ELG 7572)	Sujets choisis en telecommun
EACJ 5704 (ELG 5180)	Advanced Digital Communication

#### **INTEGRATED CIRCUITS AND DEVICES**

##### **Department of Electronics (Carleton)**

ELEC 5502 (ELG 6352)	Analog Integrated Filters
ELEC 5503 (ELG 6353)	Radio Frequency Integrated Circuit Design
ELEC 5509 (ELG 6359)	Integrated Circuit Technology
ELEC 5600 (ELG 6360)	Digital Integrated Circuit Testing
ELEC 5703 (ELG 6373)	Advanced Topics in Solid State Devices and IC Technology
ELEC 5705 (ELG 6375)	Advanced Topics in VLSI
ELEC 5706 (ELG 6376)	Submicron CMOS and BiCMOS Circuits for Sampled Data Applications

ELEC 5707 (ELG 6377)	Microsensors and MEMS
ELEC 5800 (ELG 6380)	Theory of Semiconductor Devices
ELEC 5801 (ELG 6381)	High-Speed and Low-Power VLSI
ELEC 5802 (ELG 6382)	Surface-Controlled Semiconductor Devices
ELEC 5804 (ELG 6384)	VLSI Design
ELEC 5805 (ELG 6385)	VLSI Design Project
ELEC 5808 (ELG 6388)	Signal Processing Electronics
ELEC 5809 (ELG 6389)	Nonlinear Electronic Circuits

##### **Systems and Computer Engineering (Carleton)**

##### **School of Electrical Engineering and Computer Science (Ottawa)**

EACJ 5006 (ELG 7132)	Topics in Electronics I
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EACJ 5007 (ELG 7133)	Topics in Electronics II
EACJ 5008 (ELG 7575)	Sujets choisis en electronique
EACJ 5103 (ELG 5198)	Parallel Processing with VLSI
EACJ 5208/ ELEC 5200 [0.5] (ELG 6320)	Wireless Ad Hoc Networking

## **MICROWAVES AND ELECTROMAGNETICS**

### **Department of Electronics (Carleton)**

ELEC 5409 (ELG 6349)	Microwave and Millimeterwave Integrated Circuits
ELEC 5501 (ELG 6351)	Passive Microwave Circuits
ELEC 5602 (ELG 6362)	Microwave Semiconductor Devices and Applications
ELEC 5604 (ELG 6364)	Radar Systems
ELEC 5607 (ELG 6367)	Fundamentals of Antenna Engineering
ELEC 5608 (ELG 6368)	Fourier Optics
ELEC 5609 (ELG 6369)	Nonlinear Microwave Devices and Effects
ELEC 5707 (ELG 6377)	Microsensors and MEMS
ELEC 5709 (ELG 6379)	Advanced Topics in Electromagnetics

### **School of Electrical Engineering and Computer Science (Ottawa)**

EACJ 5308 (ELG 7500)	Sujets choisis electromagnetiq
EACJ 5401 (ELG 5104)	Electromagnetic Waves
EACJ 5402 (ELG 5379)	Numerical Methods: Electromag
EACJ 5404 (ELG 7100)	Topics in Electromagnetics I
EACJ 5405 (ELG 7101)	Topics in Electromagnetics II

## **PHOTONIC SYSTEMS**

### **Department of Electronics (Carleton)**

ELEC 5701 (ELG 6371)	Fibre and Waveguide Components for Communications and Sensors
ELEC 5702 (ELG 6372)	Principles of Photonics
ELEC 5705 (ELG 6375)	Advanced Topics in VLSI
ELEC 5708 (ELG 6378)	ASICs in Telecommunications
ELEC 5709 (ELG 6379)	Advanced Topics in Electromagnetics
EACJ 5004 (ELG 5381)	Photonics Networks
EACJ 5201 (ELG 5103)	Optical Communications Systems
EACJ 5404 (ELG 7100)	Topics in Electromagnetics I

## **SIGNAL, SPEECH, AND IMAGE PROCESSING**

### **Systems and Computer Engineering (Carleton)**

SYSC 5304 (ELG 5127)	Medical Imaging Modalities
SYSC 5370 (ELG 5370)	Wavelets and Multiresolution Signal Analysis
SYSC 5600 (ELG 6160)	Adaptive Signal Processing
SYSC 5602 (ELG 6162)	Digital Signal Processing

### **School of Electrical Engineering and Computer Science (Ottawa)**

EACJ 5360 (ELG 5360)	Digital Watermarking
EACJ 5385 (ELG 5385)	Matrix Method and Algor Sign Proce
EACJ 5507 (ELG 5376)	Digital Signal Processing
EACJ 5508 (ELG 5776)	Traitement numer des signaux
EACJ 5509 (ELG 5378)	Image Proc and Image Comm
EACJ 5600 (ELG 7172)	Topics in Signal Processing I
EACJ 5601 (ELG 7173)	Topics in Signal Processing II
EACJ 5603 (ELG 7179)	Topics in Signal Processing 3
EACJ 5800 (ELG 5377)	Adaptive Signal Processing

## **SYSTEMS AND MACHINE INTELLIGENCE**

### **Systems and Computer Engineering (Carleton)**

SYSC 5001 (ELG 6101)	Simulation and Modeling
SYSC 5004 (ELG 6104)	Optimization for Engineering Applications
SYSC 5401 (ELG 6141)	Adaptive and Learning Systems
SYSC 5405 (ELG 6102)	Pattern Classification and Experiment Design

### **School of Electrical Engineering and Computer Science (Ottawa)**

EACJ 5100 (ELG 5163)	Machine Vision
EACJ 5204 (ELG 5124)	Virtual Environments
EACJ 5207 (ELG 5161)	Robotics: Control/Sensing/Intel
EACJ 5209 (ELG 7113)	Topics in Systems and Control I
EACJ 5709 (ELG 5196)	Neural Networks and Fuzzy System
EACJ 7116 (ELG 7116)	Signal Proc: Intr Convex Optim
EACJ 5386 (ELG 5386)	Neural Networks and Fuzzy System

## **Admission**

The normal requirement for admission to a master's program is a bachelor's degree in electrical engineering or a related discipline with a CGPA of B+.

### Accelerated Pathway

The accelerated pathway in the M.A.Sc. and M.Eng. Electrical and Computer Engineering program is a flexible and individualized plan of graduate study for students in their final year of a Carleton B.Eng degree. Students with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third-year of study in the B.Eng. degree should consult with both the Undergraduate Chair and the Graduate Chair to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### Accelerated Pathway Requirements

1. At least 0.5 credit in ELEC or SYSC courses, or other approved courses, at the 5000-level with a grade of B+ or higher.
2. Minimum overall CGPA of A-.

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### Admission

The normal requirement for admission into the Ph.D. program is a master's degree with thesis in electrical engineering or a related discipline.

### Regulations

See the General Regulations section of this Calendar.

### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the M.Eng. Electrical and Computer Engineering (coursework and research project pathways only), including all concentrations and specializations, is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### Electrical Engineering - Joint (EACJ) Courses

**EACJ 5003 [0.5 credit]**  
**Fourier Optics**

**EACJ 5004 [0.5 credit]**  
**Photonics Networks**

**EACJ 5006 [0.5 credit]**  
**Topics in Electronics I**

**EACJ 5007 [0.5 credit]**  
**Topics in Electronics II**

**EACJ 5008 [0.5 credit]**  
**Sujets choisis en électronique**

**EACJ 5009 [0.5 credit]**  
**Survivable Optical Networks**

**EACJ 5100 [0.5 credit]**  
**Machine Vision**

**EACJ 5101 [0.5 credit]**  
**Directed Studies**

**EACJ 5103 [0.5 credit]**  
**Parallel Processing with VLSI**

**EACJ 5104 [0.5 credit]**  
**Distributed Database Systems**

**EACJ 5105 [0.5 credit]**  
**Secure Comm and Data Encryption**

**EACJ 5107 [0.5 credit]**  
**Multimedia Communications**

**EACJ 5108 [0.5 credit]**  
**Switching and Traffic Theory**

**EACJ 5109 [0.5 credit]**  
**Stochastic Processes**

**EACJ 5131 [0.5 credit]**  
**Topics in Electromagnetics**

**EACJ 5132 [0.5 credit]**  
**Smart Antennas**

**EACJ 5133 [0.5 credit]**  
**Intro to Mobile Communications**

**EACJ 5200 [0.5 credit]**  
**Queuing Systems**

**EACJ 5201 [0.5 credit]**  
**Optical Communications Systems**

**EACJ 5202 [0.5 credit]**  
**Analysis/Perf Eval: Comp Comm**

**EACJ 5203 [0.5 credit]**  
**Distributed System Software**

**EACJ 5204 [0.5 credit]**  
**Virtual Environments**  
Includes: Experiential Learning Activity

**EACJ 5205 [0.5 credit]**  
**Quality Service Mgmt/Multimed**

**EACJ 5206 [0.5 credit]**  
**Source Coding and Data Compress.**

**EACJ 5207 [0.5 credit]**  
**Robotics:Control/Sensing/Intel**

**EACJ 5208 [0.5 credit]**  
**Wireless Ad Hoc Networking**

**EACJ 5209 [0.5 credit]**  
**Topics in Systems and Control I**

**EACJ 5211 [0.5 credit]**  
**Software Engineering Proj Mgmt**

**EACJ 5300 [0.5 credit]**  
**Topics in Systems and Control II**

**EACJ 5301 [0.5 credit]**  
**Sujets choisis en systemes**

**EACJ 5308 [0.5 credit]**  
**Sujets choisis electromagnetiq**

**EACJ 5360 [0.5 credit]**  
**Digital Watermarking**

**EACJ 5369 [0.5 credit]**  
**Internetworking Technologies**

**EACJ 5384 [0.5 credit]**  
**Network Security and Cryptography**

**EACJ 5385 [0.5 credit]**  
**Matrix MethodandAlgor Sign Proce**

**EACJ 5386 [0.5 credit]**  
**Neural Networks and Fuzzy System**

**EACJ 5401 [0.5 credit]**  
**Electromagnetic Waves**

**EACJ 5402 [0.5 credit]**  
**Numerical Methods: Electromag**

**EACJ 5404 [0.5 credit]**  
**Topics in Electromagnetics I**

**EACJ 5405 [0.5 credit]**  
**Topics in Electromagnetics II**

**EACJ 5500 [0.5 credit]**  
**Digital Comm by Satellite**

**EACJ 5501 [0.5 credit]**  
**Information Theory**

**EACJ 5503 [0.5 credit]**  
**Detection and Estimation**

**EACJ 5504 [0.5 credit]**  
**Error Control Coding**

**EACJ 5506 [0.5 credit]**  
**Principles of Digital Comm**

**EACJ 5507 [0.5 credit]**  
**Digital Signal Processing**

**EACJ 5508 [0.5 credit]**  
**Traitement numer des signaux**

**EACJ 5509 [0.5 credit]**  
**Image Proc and Image Comm**

**EACJ 5600 [0.5 credit]**  
**Topics in Signal Processing I**

**EACJ 5601 [0.5 credit]**  
**Topics in Signal Processing II**

**EACJ 5603 [0.5 credit]**  
**Topics in Signal Processing 3**

**EACJ 5605 [0.5 credit]**  
**Topics in Communications I**

**EACJ 5606 [0.5 credit]**  
**Topics in Communications II**

**EACJ 5607 [0.5 credit]**  
**Computer-Communication Network**

**EACJ 5702 [0.5 credit]**  
**Sujets choisis en telecommun**

**EACJ 5703 [0.5 credit]**  
**Reliable Digital Systems**  
Includes: Experiential Learning Activity

**EACJ 5704 [0.5 credit]**  
**Advanced Digital Communication**

**EACJ 5705 [0.5 credit]**  
**Digital Logic Design**

**EACJ 5709 [0.5 credit]**  
**Neural Networks and Fuzzy System**

**EACJ 5800 [0.5 credit]**  
**Adaptive Signal Processing**

**EACJ 5807 [0.5 credit]**  
**Topics in Computers I**

**EACJ 5808 [0.5 credit]**  
**Topics in Computers II**

**EACJ 5900 [0.5 credit]**  
**Sujets choisis sur les ordinat**

**EACJ 7116 [0.5 credit]**  
**Signal Proc: Intr Convex Optim**

### **Electronics (ELEC) Courses**

Note: The Departments of Electronics and Systems and Computer Engineering offer courses in: Biomedical and Electrical Engineering, Communications Engineering, Computer Systems Engineering, Electrical Engineering, Software Engineering and Engineering Physics.

**ELEC 5200 [0.5 credit] (ELG 6320)**  
**Advanced Topics in Integrated Circuits and Devices**  
Topics vary from year to year.

**ELEC 5301 [0.5 credit]**  
**Silicon Photonics**  
Fundamentals of silicon photonics, advanced electromagnetic theory, guided wave optics, interferometry, silicon-on-insulator (SOI) photonics, silicon based waveguide devices (planar, rib, strip), fabrication of photonic devices, passive and active silicon photonic devices such as modulators, lasers, detectors, silicon opto-electronic integration.

**ELEC 5302 [0.5 credit]**  
**Renewable and Distributed Energy Resource Technologies**  
Topics covered include renewable energy resources, photovoltaic systems, wind generation systems, energy storage units, electric vehicles, grid integration, distributed generation, microgrid, active distribution network, modeling and analysis of power system components, state-of-the-art power system simulation tools.

**ELEC 5303 [0.5 credit] (ELG 6320 100)**  
**Advanced Power Systems Analysis**  
Power system sustainability and control, transmission lines, transformers, synchronous generators, induction motor, power flow, small-signal stability, transient stability, voltage stability, state of the art power system simulation tools.  
Precludes additional credit for ELEC 5200.

**ELEC 5304 [0.5 credit] (ELG 6397)**  
**Solar Cells - Principles, Materials, Systems and Operation**  
Solar radiation. Solar cells: crystalline silicon, thin film technologies, space and concentrator cells, organic and dye sensitized. Photovoltaic systems: introduction, balance of system components, grid-connected systems, space and concentrator systems. Testing, monitoring, and calibration standards. Economics, environment and business strategy.  
Precludes additional credit for ELEC 5703.

**ELEC 5305 [0.5 credit] (ELG 7113)**  
**Electric Motor Drives**  
DC and AC motors, speed and torque control, efficiency, maximum torque per ampere, power converters, rectifiers, inverters, field-oriented vector control, direct torque control, and sensorless control.  
Precludes additional credit for EACJ 5209.

**ELEC 5401 [0.5 credit] (ELG 6341)****Signal Integrity in High-Speed Designs: Modeling and Analysis**

Crosstalk, distortion, ground bounce, skin effect. Interconnect modeling/simulation, packages, ground/power planes, Elmore delay, lossy-coupled, frequency-dependent transmission lines, telegraphers equations, extraction, measured parameters, macromodeling: passivity/causality, MoC/MRA, vector fit, model reduction, electromagnetic compatibility/interference, mixed-domain systems, concurrent analysis. Precludes additional credit for ELEC 5704 (ELG 6374). Prerequisite(s): permission of the Department.

**ELEC 5402 [0.5 credit] (ELG 6342)****Introduction to Electronic Design Automation Algorithms and Techniques**

Digital design process; overview of design automation tools/methodologies; theory of computational complexity; layout compaction; placement and partitioning; floorplanning; routing; digital simulation; switch-level simulation; logic synthesis; verification; analog and RF simulation. Precludes additional credit for ELEC 5704 Section "Y" (ELG 6374 Section "Y").

**ELEC 5404 [0.5 credit] (ELG 6344)****Neural Networks for High-Speed/High-Frequency Circuit Design**

Introduction to neural network methodologies for computer-aided design of high-speed/high-frequency circuits, including modeling of passive and active devices/circuits, and their applications in high-level design and optimization in wired and wireless electronic systems.

**ELEC 5405 [0.5 credit] (ELG 6340)****Advanced Linear and Nonlinear Circuit Theory and Applications**

Graph theory, incidence matrices, cutset matrices, generalized KCL, topological formulation, state-space equations, Tellegen's theorem, state-transition matrix, multi-port representation, stability, passivity, causality, synthesis of passive circuits, active networks, nonlinear dynamic circuits.

**ELEC 5408 [0.5 credit] (ELG 7100 100)****Wireless Power Transfer and Energy Harvesting**

Principles and design guidelines for efficient wireless power transfer and harvesting, short and long range power transfer, RF energy scavenging, and contactless communication. System and subsystem circuit design and analysis is expected and commercial software will be used for all course deliverables. Precludes additional credit for EACJ 5131. Lecture

**ELEC 5409 [0.5 credit] (ELG 6349)****Microwave and Millimeterwave Integrated Circuits**

Design of communications electronics components with emphasis on GaAs MMIC implementation. Overview of MESFET, HEMT, HBT device modeling. Integrated lumped/ distributed passive element modeling. Broadband impedance matching. Design of direct-coupled amplifiers, distributed amplifiers, power devices and amplifiers, phase shifters, switches, attenuators, mixers, oscillators.

**ELEC 5501 [0.5 credit] (ELG 6351)****Passive Microwave Circuits**

Characteristics of homogeneous and inhomogeneous transmission lines and waveguides. Planar transmission lines: stripline, microstrip, coplanar line, slotline. Coupled transmission lines. Modeling of discontinuities. Ferrite components. Microwave network analysis: s-parameters, CAD models. Design of impedance-matching networks, directional couplers, power splitters, filters. Applications in MICs and MMICs.

**ELEC 5502 [0.5 credit] (ELG 6352)****Analog Integrated Filters**

The fundamentals and details of analog continuous-time and SAW filters. Comparison to switched-capacitor filters. Review of filter concepts, types of filters, approximations, transformations. Building blocks such as op amps, transconductance amplifiers, and gyrators. Design using cascaded second-order sections, multiple loop feedback and LC ladder simulations.

**ELEC 5503 [0.5 credit] (ELG 6353)****Radio Frequency Integrated Circuit Design**

Integrated radio front-end component design. Overview of radio systems, frequency response, gain, noise, linearity, intermodulation, image rejection, impedance matching, stability, and power dissipation. Detailed design of low-noise amplifiers, mixers, oscillators and power amplifiers. Use of on-chip inductors and baluns. Process variations, parasitics, and packaging.

**ELEC 5504 [0.5 credit] (ELG 6354)****Analysis of High-Speed Electronic Packages and Interconnects**

Introduction to modeling, simulation and optimization of high-speed VLSI packages; models for packages, interconnects and ground/power planes; lumped, distributed and EM models for interconnects; delay, crosstalk and switching noise; moment matching techniques; concurrent thermal/electrical analysis of IC packages and boards.

**ELEC 5506 [0.5 credit] (ELG 6356)****Simulation and Optimization of Electronic Circuits**

Introduction to computer simulation and optimization of electrical circuits. Time- and frequency-domain formulations for sensitivity analysis and optimization. Optimization techniques for performance-, cost- and yield-driven design of electronic circuits. Optimization approaches to modeling and parameter extraction of active and passive elements.

**ELEC 5508 [0.5 credit] (ELG 6358)****Advanced Methods for Simulation of Large-Scale Circuits and Systems**

Formulation of circuit equations. Sparse matrix techniques. Frequency and time-domain solutions. Relaxation techniques and timing analysis. Noise and distortion analysis. Transmission line effects. Interconnect analysis and crosstalk simulation. Numerical inversion techniques. Asymptotic waveform estimation. Mixed frequency/time domain techniques. Sensitivity analysis.

**ELEC 5509 [0.5 credit] (ELG 6359)****Integrated Circuit Technology**

Survey of technology used in silicon VLSI integrated circuit fabrication. Crystal growth and crystal defects, oxidation, diffusion, ion implantation and annealing, gettering, CVD, etching, materials for metallization and contacting, and photolithography. Structures and fabrication techniques required for submicron MOSFETs. Applications in advanced CMOS processes.

**ELEC 5600 [0.5 credit] (ELG 6360)****Digital Integrated Circuit Testing**

Production testing of digital integrated circuits. Outline of methods of testing used in production. Testing schemes and design for testability. Faults and fault models, yield estimates, testability measures, fault simulation, test generation methods, sequential testing, scan design, boundary scan, built-in self test, CMOS testing.

**ELEC 5602 [0.5 credit] (ELG 6362)****Microwave Semiconductor Devices and Applications**

Theory of operation for microwave diodes (varactor, p-i-n, Gunn, IMPATT) and transistors (BJT, MESFET, HBT, HEMT). Small-signal, large-signal, and noise models for CAD. Diode oscillators and reflection amplifiers. Design of transistor oscillators and amplifiers. Discussion of technology/fabrication issues and MMIC applications.

**ELEC 5604 [0.5 credit] (ELG 6364)****Radar Systems**

Fundamentals; range equation, minimum detectable signal, radar cross-section, pulse repetition frequency, range ambiguities. Radar classes: CW, FM-CW, MTI, tracking, air surveillance, SSR, PAR, MLS, SAR, SLAR, OTH, 3D and bistatic radars. Radar subsystems; transmitters, antennas, receivers, processors, displays, detection criteria; CFAR receivers, noise, clutter precipitation.

**ELEC 5605 [0.5 credit] (ELG 6365)****Optical Fibre Communications**

Transmission characteristics of and design considerations for multi-mode and single-mode optical fibre waveguides; materials, structures, and device properties of laser light sources; properties and performance of p-i-n and avalanche photodiodes; types of optical fibre signal formats, preamplifier topologies, noise, receiver sensitivity, transmitter design, link design.

**ELEC 5606 [0.5 credit] (ELG 6366)****Phase-Locked Loops and Receiver Synchronizers**

Phase-locked loops; components, fundamentals, stability, transient response, sinusoidal operation, noise performance, tracking, acquisition and optimization. Receiver synchronizers: carrier synchronizers including squaring loop, Costas loop, and remodulator for BPSK, QPSK BER performance; clock synchronizers including early-late gate, in-phase/midphase, and delay line multiplier.

**ELEC 5607 [0.5 credit] (ELG 6367)****Fundamentals of Antenna Engineering**

Basic properties of antennas (gain, radiation patterns, polarization, antenna temperature). Analysis of common antennas (dipoles, loops, helices, aperture antennas, microstrip, dielectric resonator antennas, reflectors). Analysis and design of linear and planar arrays (array factors, beam scanning, amplitude weighting, feed networks).

**ELEC 5608 [0.5 credit] (ELG 6368)****Fourier Optics**

The theory and applications of diffractive and non-diffractive coherent optics, with emphasis on holograms, tomography and high-speed optical computing. Mathematical basis: generalized 2-D Fourier transforms, transfer function of an optical system, 2-D sampling theory, Helmholtz equation, Green's theorem, and the classical diffraction theories.

**ELEC 5609 [0.5 credit] (ELG 6369)****Nonlinear Microwave Devices and Effects**

The physical basis and mathematical modeling of a variety of microwave/millimeter-wave devices, (some of which exhibit the most extreme nonlinear behaviour known), how they can be exploited in practical circuits and systems, and how the resulting device/circuit interactions can be analyzed.

**ELEC 5701 [0.5 credit] (ELG 6371)****Fibre and Waveguide Components for Communications and Sensors**

Optical wave propagation in dielectric waveguides. Theory and practice for passive photonic devices used for routing, filtering, and signal processing, including structural and biochemical sensors. Directional couplers and splitters, filters (gratings and etalons), Mach-Zehnder interferometers, Arrayed waveguide gratings, and dispersion compensators.

**ELEC 5702 [0.5 credit] (ELG 6372)****Principles of Photonics**

Electromagnetic wave propagation in crystals; review of geometric optics; Gaussian beam propagation; optical fibres; dielectric waveguides for optical integrated circuits; optical resonators; optical properties of materials; theory of laser oscillation; specific laser systems; electro-optic modulators; photorefractive materials and applications; holography; optical interconnects.

**ELEC 5703 [0.5 credit] (ELG 6373)****Advanced Topics in Solid State Devices and IC Technology**

Recent and advanced topics in semiconductor device physics, modeling, and integrated circuit fabrication technology. Topic varies from year to year according to departmental research interests. Students may be expected to contribute lectures or seminars on selected topics.

**ELEC 5704 [0.5 credit] (ELG 6374)****Advanced Topics in CAD**

Recent and advanced topics in computer-aided techniques for the design of VLSI and telecommunications circuits. Topics will vary from year to year according to the departmental research interests. Students may be expected to contribute lectures or seminars on selected topics.

**ELEC 5705 [0.5 credit] (ELG 6375)****Advanced Topics in VLSI**

Recent and advanced topics in the design of very large scale integrated circuits, with emphasis on mixed analog/digital circuits for telecommunications applications. Topic varies from year to year according to departmental research interests. Students may be expected to contribute lectures or seminars on selected topics.

**ELEC 5706 [0.5 credit] (ELG 6376)****Submicron CMOS and BiCMOS Circuits for Sampled Data Applications**

The analog aspects of digital CMOS and BiCMOS circuit design in submicron technologies including reliability; sampled analog circuits, including amplifier non-ideal characteristics and switch charge injection; CMOS/BiCMOS amplifier design considerations, leading up to standard folded-cascode and two-stage circuits.

**ELEC 5707 [0.5 credit] (ELG 6377)****Microsensors and MEMS**

Physical design of microelectromechanical systems (MEMS) and microfabricated sensors and actuators. An overview of thin and thick film processes and micromachining techniques will provide fabrication background. Device design including piezoresistive, piezoelectric, electromagnetic, thermal, optical, and chemical sensors and actuators.

**ELEC 5708 [0.5 credit] (ELG 6378)****ASICs in Telecommunications**

Introduction to modern ASIC technologies for Telecom. Review of circuit-level building blocks for typical wireline and wireless applications, including power/performance tradeoffs. Corresponding FPGA analog and digital IO circuits are discussed. A topical literature study and circuit level design exercises.

**ELEC 5709 [0.5 credit] (ELG 6379)****Advanced Topics in Electromagnetics**

Recent and advanced topics in electro-magnetics, antennas, radar systems, microwave devices and circuits, or optoelectronics. The subject material will vary from year to year according to research interests in the department and/or expertise provided by visiting scholars or sessional lecturers.

**ELEC 5800 [0.5 credit] (ELG 6380)****Theory of Semiconductor Devices**

Equilibrium and non-equilibrium conditions in a semiconductor. Carrier transport theory. Physical theory of basic semiconductor device structures and aspects of design: PN junctions and bipolar transistors, field effect devices. Current transport relationships for transistors. Charge control theory. Modeling of device mechanisms. Performance limitations of transistors.

**ELEC 5801 [0.5 credit] (ELG 6381)****High-Speed and Low-Power VLSI**

High-Speed and Low-Power CMOS VLSI circuit techniques. Low and high levels of abstraction; transistor, switch, logic-gate, module, system levels. State-of-the-art techniques to optimize the performance and energy consumption of a circuit. One or more of these techniques are used in a design project.

Prerequisite(s): ELEC 4708 or ELEC 5804 or the equivalent or permission of the instructor.

**ELEC 5802 [0.5 credit] (ELG 6382)****Surface-Controlled Semiconductor Devices**

Fundamentals of the MOS system; MOS capacitors. Long channel behaviour: theory, limitations and performance of the SPICE level 1 and 2 models. Small geometry effects. Subthreshold operation and modeling. Hot electron effects and reliability.

**ELEC 5803 [0.5 credit] (ELG 6383)****Behavioural Synthesis of ICs**

Various topics related to computer analysis and synthesis of VLSI circuits including: logic synthesis, finite state machine synthesis, design methodologies, design for reuse, testing, common VLSI functions, a review of Verilog.

Prerequisite(s): Some IC design knowledge such as given in ELEC 4708.

**ELEC 5804 [0.5 credit] (ELG 6384)****VLSI Design**

IC design course with strong emphasis on design methodology, to be followed by ELEC 5805 (ELG 6385) in the second term. Design philosophies considered will include Full Custom design, standard cells, gate-arrays and sea-of-gates using CMOS and BiCMOS technology. State-of-the-art computer-aided design tools are used.

**ELEC 5805 [0.5 credit] (ELG 6385)****VLSI Design Project**

Using state-of-the-art CMOS and BiCMOS technologies, students will initiate their own design of an integrated circuit using tools in the CAD lab and submit it for fabrication where the design warrants.

**ELEC 5807 [0.5 credit] (ELG 6375)****RF System Design**

System level design of a typical integrated radio. System architectures for radio front ends. Detailed design procedures going from a radio specification to determine block level specifications: determining NF, EVM, phase noise, linearity from BER and radio range requirements. Precludes additional credit for ELEC 5705.

Prerequisite(s): None.

Seminar

**ELEC 5808 [0.5 credit] (ELG 6388)****Signal Processing Electronics**

CCDs, transversal filters, recursive filters, switched capacitor filters, with particular emphasis on integration of analog signal processing techniques in monolithic MOS ICs. Detailed op amp design in CMOS technology. Implications of nonideal op amp behaviour in filter performance. Basic sampled data concepts.

**ELEC 5809 [0.5 credit] (ELG 6389)****Nonlinear Electronic Circuits**

Introduction to non-linear circuits used in today's telecommunications ICs; CMOS non-linear circuits such as direct-RF-sampling mixers, phase-detectors; digital loop-filters, DCOs, frequency synthesizers and clock-and-data-recovery are introduced. Modeling of these non-linear circuits and existing options for simulations and closed form circuit analysis is presented.

Precludes additional credit for ELEC 5705 (ELG 6375).

Prerequisite(s): permission of the Department.

**ELEC 5900 [0.5 credit] (ELG 6389)****Engineering Project I**

A one-term course, carrying 0.5 credit, for students pursuing the course work M.Eng. program. An engineering study, analysis and/or design project under the supervision of a faculty member. Written and oral reports are required. This course may be repeated for credit.

Includes: Experiential Learning Activity

**ELEC 5901 [1.0 credit] (ELG 6389)****Engineering Project II**

A one-term course, carrying full-course credit, for students pursuing the course work or co-op M.Eng. program. An engineering study, analysis and/or design project under the supervision of a faculty member. Written and oral reports are required.

Includes: Experiential Learning Activity

**ELEC 5906 [0.5 credit] (ELG 6389)****Directed Studies**

Various possibilities exist for pursuing directed studies on topics approved by a course supervisor, including the above listed course topics where they are not offered on a formal basis.

**ELEC 5909 [2.5 credits]****M.A.Sc. Thesis**

Includes: Experiential Learning Activity

**ELEC 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## **Systems and Computer Engineering (SYSC) Courses**

**SYSC 5001 [0.5 credit] (ELG 6101)****Simulation and Modeling**

Simulation as a problem solving tool. Random variable generation, general discrete simulation procedure: event table and statistical gathering. Analyses of simulation data: point and interval estimation. Confidence intervals. Overview of modeling, simulation and problem solving using SIMSCRIPT, MODSIM and other languages. Also offered at the undergraduate level, with different requirements, as SYSC 4005, for which additional credit is precluded.

**SYSC 5004 [0.5 credit] (ELG 6104)****Optimization for Engineering Applications**

Introduction to algorithms and computer methods for optimizing complex engineering systems. Includes linear programming, networks, nonlinear programming, integer and mixed-integer programming, genetic algorithms and search methods, and dynamic programming. Emphasizes practical algorithms and computer methods for engineering applications.

**SYSC 5008 [0.5 credit]****Cryptographic Engineering and Side-Channel Analysis**

An introductory course on cryptography for engineers. Lectures will discuss direct, simplified implementations of the AES, SHA-3, RSA, ECC, and a selection from PQC algorithms, and a brief overview of their mathematical reasonings. The course will also introduce a collection of implementation attacks.

Includes: Experiential Learning Activity

**SYSC 5009 [0.5 credit]****Human-centric Security and Privacy**

Introduction to human-centric research with a focus on security and privacy. Topics include: privacy and security for different types of users, integrating privacy and security in software development, privacy and security in IoT devices from users' perspective, and the design and development of secure systems.

Includes: Experiential Learning Activity

Precludes additional credit for COMP 5110.

Prerequisite(s): Undergraduate-level knowledge of security and Human-Computer Interaction (HCI) is recommended, but not mandatory. Permission of the department or the instructor.

**SYSC 5101 [0.5 credit] (ELG 6111)****Design of High Performance Software**

Designing software to demanding performance specifications. Design analysis using models of computation, workload, and performance. Principles to govern design improvement for sequential, concurrent and parallel execution, based on resource architecture and quantitative analysis.

Prerequisite(s): SYSC 5704 (ELG 6174) and a course in software engineering, or equivalent.

Also offered at the undergraduate level, with different requirements, as SYSC 4102, for which additional credit is precluded.

**SYSC 5103 [0.5 credit] (ELG 6113)****Software Agents**

Agent-based programming; elements of Distributed Artificial Intelligence; beliefs, desires and intentions; component-based technology; languages for agent implementations; interface agents; information sharing and coordination; KIF; collaboration; communication; ontologies; KQML; autonomy; adaptability; security issues; mobility; standards; agent design issues and frameworks, applications in telecommunications.

Prerequisite(s): Knowledge of Java, C/C++ or Smalltalk.

**SYSC 5104 [0.5 credit] (ELG 6114)****Methodologies For Discrete-Event Modeling And Simulation**

Methodological aspects of simulation. Modeling discrete events systems. Modeling formalisms: FSA, FSM, Petri Nets, DEVS, others. Verification and validation. Cellular models: Cellular Automata, Cell-DEVS. Continuous and hybrid models. Parallel and Distributed simulation (PADS) techniques. PADS middleware: HLA, Parallel-DEVS, Time-Warp.

Prerequisite(s): knowledge of C++ and of basic concepts of concurrency and distributed systems.

**SYSC 5105 [0.5 credit] (ELG 6115)****Software Quality Engineering and Management**

All aspects of software quality engineering. Software testing, at all stages of the software development and maintenance life cycle. Software reviews and inspections. Use of software measurement and quantitative modeling for the purpose of software quality control and improvement.

Precludes additional credit for CSI 5111 (COMP 5501).

Prerequisite(s): an undergraduate course in software engineering such as SYSC 4800 or SEG 3300, or equivalent, and basic statistics.

**SYSC 5106 [0.5 credit]****Advanced Data Visualization**

Fundamental concepts of information visualizations, including an introduction to visualization (importance, basic approaches, and existing tools), abstract visualization concepts, human perception, visualization methodology, interaction, design and development of interactive visualization systems, use of visualization software, tools, and techniques.

Includes: Experiential Learning Activity

Also listed as BIOM 5409.

Precludes additional credit for ITEC 5207.

Prerequisite(s): basic knowledge of programming.

**SYSC 5108 [0.5 credit] (ELG 6118)****Topics in Information Systems**

Recent and advanced topics in the field of Information Systems and its related areas.

**SYSC 5200 [0.5 credit] (ELG 6120)****Algebraic Coding Theory**

Review of Algebra, Finite Fields, Linear Block Codes and their Properties, Hamming Codes, Cyclic Codes, Hadamard Matrices and Hadamard Codes, Golay Codes, Reed-Muller Codes, BCH and Reed-Solomon Codes, Decoding Algorithms, Coding Bounds.

**SYSC 5201 [0.5 credit] (ELG 6121)****Computer Communication**

Computer network types, introductory queuing theory and performance analysis. OSI layering and BISDN layering modifications. Data link layer. Local area networks and random access (CSMA- CD, switched ethernet, token ring, wireless LAN). Public Networks. IP networks, addressing, routing. Transport layer, flow control. Introduction to ISDN. Precludes additional credit for EACJ 5607 (ELG 5374) or SYSC 4602 (ELG 4181).

Prerequisite(s): Undergraduate preparation in probability theory equivalent to STAT 3502.

**SYSC 5202 [0.5 credit] (BMG 5107)****Applications in Biomedical Image Processing**

Image processing methods applied to biomedical images. Overview of medical imaging modalities. Image enhancement, segmentation, registration and fusion. Image quality metrics. Image formats. Application examples.

Includes: Experiential Learning Activity

Also listed as BIOM 5202.

**SYSC 5206 [0.5 credit]****Resource Management on Distributed Systems**

Principles and techniques for resource management on distributed systems including clouds, grids and data analytics platforms; management of computing and storage resources; service level agreements; performance and energy aware techniques for scheduling, allocation, dynamic resource provisioning; cyber-physical systems and BigData; resource management for BigData analytics.

Includes: Experiential Learning Activity

**SYSC 5207 [0.5 credit] (ELG 6127)****Distributed Systems Engineering**

Techniques for representing distributed systems: graphical and textual models. Processes, threads, synchronization and inter-process communication techniques, RPC. Middleware: client-server (CORBA), grids, Web services. Resource management: processor allocation, load sharing, Grid scheduling, real-time issues. Protocol: OSI model, application and presentation layers. Prerequisite(s): permission of the Department.

**SYSC 5301 [0.5 credit] (ELG 6131)****Advanced Topics in Biomedical Engineering**

Topics vary from year to year.

Also listed as EACJ 5127 (ELG 6131).

Prerequisite(s): permission of the Department.

**SYSC 5302 [0.5 credit] (ELG 6321)****Biomedical Instrumentation**

Instrumentation designed to measure physiological variables related to the function of the heart, lungs, kidney, nervous and musculo-skeletal system; emergency, critical care, surgery and anaesthesia equipment.

Also listed as EACJ 5302 (ELG 6321).

Precludes additional credit for BIOM 5100 (BMG 5103).

Prerequisite(s): permission of the instructor.

**SYSC 5303 [0.5 credit] (ELG 6133)****Interactive Networked Systems and Telemedicine**

Telemanipulator; human motoring and sensory capabilities; typical interface devices; mathematical model of haptic interfaces; haptic rendering; stability and transparency; remote control schemes; time delay compensation; networking and realtime protocols, history and challenges of telemedicine; telemedicine applications: telesurgery, telemonitoring, telediagnosis and telehomecare.

Also listed as BIOM 5402 (BMG 5304).

Prerequisite(s): permission of the Department.

**SYSC 5304 [0.5 credit] (ELG 5127)****Medical Imaging Modalities**

Mathematical models of image formation based on the image modality and tissue properties. Linear models of image degradation and reconstruction. Inverse problems and regularization for image reconstruction. Image formation in radiology, computed tomography, magnetic resonance imaging, nuclear medicine, ultrasound, positron emission tomography.

Also listed as BIOM 5200 (BMG 5105).

**SYSC 5306 [0.5 credit] (ELG 6136)****Mobile Computing Systems**

Systems to build mobile applications. Covers data link layer to application layer. Emphasis on existing wireless infrastructure and IETF protocols. Focuses on view of mobile application developer; communication systems, middleware and application frameworks, defacto standards proposed/developed by industry consortia. Precludes additional credit for COMP 5402 (CSI 5142). Prerequisite(s): EACJ 5607 (ELG 5374) or SYSC 5201 (ELG 6121) or permission of the Department.

**SYSC 5307 [0.5 credit] (ELG 6307)****Biological Signals**

Modeling of neuromuscular biological signals, including subthreshold phenomena, active behaviour of cell membranes, and innervation processes. Measurement of biological signals, including electrode effects. Time domain, frequency domain, and adaptive filtering techniques for noise reduction.

Precludes additional credit for BIOM 5101 (BMG 5104).

**SYSC 5370 [0.5 credit] (ELG 5370)****Wavelets and Multiresolution Signal Analysis**

Multirate signal processing: sampling rate conversion, polyphase representation. Bases, filter banks: series expansion of discrete-time signals, series expansion of continuous-time signals, multiresolution concept and analysis, construction of wavelet, wavelet series. Complexity of multirate discrete-time processing, filter banks, and wavelet series computation.

**SYSC 5401 [0.5 credit] (ELG 6141)****Adaptive and Learning Systems**

System identification. Least squares and recursive identification techniques. Asymptotic and theoretical properties. Model structure selection. Prediction and estimation. Model reference adaptive control and self-tuning regulators. Nonlinear adaptive systems. Stability. Neural networks and neuro-control. Applications to robotics, control and pattern recognition.

Prerequisite(s): SYSC 5502 (ELG 6152) or equivalent.

**SYSC 5403 [0.5 credit] (ELG 6143)****Network Access Techniques**

A range of access technologies with emphasis on broadband access. Physical channels and the state-of-the-art of coding, modulation, multiplexing strategies to overcome physical impairments. including high-speed transmission over twisted pair, wireless, fibre and co-axial media.

Prerequisite(s): SYSC 5503 (ELG 6153), and SYSC 5504 (ELG 6154) or ELG 5375 (EACJ 5506).

**SYSC 5405 [0.5 credit] (ELG 6102)****Pattern Classification and Experiment Design**

Introduction to a variety of supervised and unsupervised pattern classification techniques with emphasis on correct application. Statistically rigorous experimental design and reporting of performance results. Case studies will be drawn from various fields including biomedical informatics.

Includes: Experiential Learning Activity

Also listed as BIOM 5405.

Prerequisite(s): undergraduate introductory probability and statistics.

**SYSC 5407 [0.5 credit] (ELG 5137)****Planning and Design of Computer Networks**

Planning process of computer networks; needs and technical requirements; modeling of different network planning problems; exact and approximate algorithms; topological planning and expansion problems; equipment (switch, router) location problem; approximate and optimal routing algorithms; presentation of various case studies. Includes: Experiential Learning Activity

**SYSC 5408 [0.5 credit]****Cross Layer Design for Wireless Networks**

Quality of service measures at different layers. Parameter adaptation, tradeoffs, and optimization at physical, data-link, network, transport, and application layers. Examples of cross-layer design in cellular, ad hoc, sensor, local area, green, and cognitive radio networks.

**SYSC 5500 [0.5 credit] (ELG 6189)****Designing Secure Networking and Computer Systems**

Network security with coverage of computer security in support of networking concepts. Covers various security issues in data networks at different protocol layers. Routing security, worm attacks, and botnets. Security of new mobile networks and emerging networked paradigms such as social networks and cloud computing. Precludes additional credit for SYSC 5801 Section "X" (ELG 6181).

**SYSC 5502 [0.5 credit] (ELG 6152)****Advanced Linear Systems**

Modeling and state space realization. Review of signals and systems. Solution to the matrix DE. Discrete time systems and the Z transform. Canonical representations and transformations. Controllability, observability and controller and observer design. LQR design and the Kalman filter. Numerous examples and applications. Precludes additional credit for MECH 4501.

**SYSC 5503 [0.5 credit] (ELG 6153)****Stochastic Processes**

Basic concepts of randomness, as applied to communications, signal processing, and queuing systems; probability theory, random variables, stochastic processes; random signals in linear systems; introduction to decision and estimation; Markov chains and elements of queuing theory. Precludes additional credit for EACJ 5109 (ELG 5119).

**SYSC 5504 [0.5 credit] (ELG 6154)****Principles of Digital Communication**

Elements of communication theory and information theory applied to digital communications systems. Characterization of noise and channel models. Optimum Receiver theory. Modulation and coding for reliable transmission: MPSK, MQAM, M-ary orthogonal modulation. Channel coding, trellis coded modulation. Spread spectrum and CDMA communications. Precludes additional credit for EACJ 5506 (ELG 5375). Prerequisite(s): SYSC 5503 (ELG 5503) or ELG 5119 (EACJ 5109) or equivalent (may be taken concurrently).

**SYSC 5506 [0.5 credit] (ELG 5170)****Information Theory**

Measure of information: entropy, relative entropy, mutual information, asymptotic equipartition property, entropy rates for stochastic processes; data compression: Huffman code, arithmetic coding; channel capacity: random coding bound, reliability function, Blahut-Arimoto algorithm, Gaussian channels, coloured Gaussian noise and 'water-filling'; rate distortion theory; network information theory. Precludes additional credit for EACJ 5501 (ELG 5170). Prerequisite(s): SYSC 5503 (ELG 6153) or EACJ 5109 (ELG 5119) or equivalent.

**SYSC 5600 [0.5 credit] (ELG 6160)****Adaptive Signal Processing**

Theory and techniques of adaptive filtering, including Wiener filters, gradient and LMS methods; adaptive transversal and lattice filters; recursive and fast recursive least squares; convergence and tracking performance; implementation. Applications, such as adaptive prediction, channel equalization, echo cancellation, source coding, antenna beamforming, spectral estimation. Precludes additional credit for EACJ 5800 (ELG 5377). Prerequisite(s): SYSC 5503 (ELG 5503) or ELG 5119 (EACJ 5109) or equivalent; SYSC 5602 (ELG 6162) or ELG 5376 (EACJ 5507) or equivalent.

**SYSC 5602 [0.5 credit] (ELG 6162)****Digital Signal Processing**

Review of discrete time signals and systems, A/D and D/A conversions, representation in time, frequency, and Z domain, DFT/FFT transforms, FIR/IIR filter design, quantization effects. Correlation functions. Cepstrum analysis. Multi-rate signal processing. Power spectrum estimation. Introduction to joint time-frequency analysis. DSP architecture: implementation approaches. Applications. Precludes additional credit for EACJ 5507 (ELG 5376).

**SYSC 5605 [0.5 credit] (ELG 6165)****Advanced Digital Communication**

Techniques and performance of digital signalling and equalization over linear bandlimited channels with additive Gaussian noise. Fading multipath channels: diversity concepts, modeling and error probability performance evaluation. Synchronization in digital communications. Spread spectrum in digital transmission over multipath fading channels. Precludes additional credit for EACJ 5704 (ELG 5780). Prerequisite(s): SYSC 5504 (ELG 6154) or equivalent.

**SYSC 5606 [0.5 credit] (ELG 6166)****Introduction to Mobile Communications**

Mobile radio channel characterization: signal strength prediction techniques and statistical coverage; fading; delay spread; interference models and outage probabilities. Digital modulation and transmission system performance. Signal processing techniques: diversity and beamforming, adaptive equalization, coding. Applications to TDMA and CDMA cellular systems.

Prerequisite(s): SYSC 5503 (ELG 5503) and SYSC 5504 (ELG 6154) (may be taken concurrently with SYSC 5606).

**SYSC 5607 [0.5 credit] (ELG 6167)****Source Coding and Data Compression**

Discrete and continuous sources. Discrete sources: Huffman coding & run length encoding. Continuous sources: waveform construction coding; PCM, DPMC, delta modulation; speech compression by parameter extraction; predictive encoding; image coding by transformation and block quantization. Fourier and Walsh transform coding. Applications to speech, television, facsimile.

Prerequisite(s): SYSC 5503 (ELG 5503) or ELG 5119 (EACJ 5109) or equivalent.

**SYSC 5608 [0.5 credit] (ELG 6168)****Wireless Communications Systems**

Fundamentals of antenna systems and radio propagation, wireless channel characterization, link budget, spectrum, cellular and personal wireless communication systems, channel reuse, system capacity, mobility and location management, channel resource allocation, radio access network (RAN), multiple access principles, security and authentication, satellite networks, wireless LANs.

**SYSC 5701 [0.5 credit] (CSI 5117)****Operating System Methods for Real-Time Applications**

Principles and methods for operating system design with application to real-time, embedded systems. Concurrent programming: mechanisms and languages; design approaches and issues; run-time support (kernel). Methods for hard real-time applications. Methods for distributed systems. Programming assignments in a suitable programming language.

Prerequisite(s): SYSC 3303 or SYSC 5704 (ELG 6174) or equivalent courses and/or experience. Programming experience in high level and assembly languages.

**SYSC 5702 [0.5 credit]****Sensor Fusion for Autonomous Systems**

Sensor fusion for autonomous navigation systems. Topics include reference frames, maps representation, state estimation, error modelling, localization and mapping, sensors for autonomous navigation, sensor fusion algorithms. The course is for students with background in signals/systems, linear-algebra, and probability.

Programming in Matlab or Python is essential.

Includes: Experiential Learning Activity

**SYSC 5703 [0.5 credit] (ELG 6173)****Integrated Database and Cloud Systems**

Review of database concepts: Conceptual database design, relational and object-oriented data models; application of SQL, recursive queries, relational algebra, and data integration; normalization theory, deductive approach to database, and query processing; object-oriented database; OLAP, data warehousing and data mining; Cloud computing, Hadoop, and MapReduce.

**SYSC 5704 [0.5 credit] (ELG 6174)****Elements of Computer Systems**

Concepts in basic computer architecture, assembly languages, high level languages including object orientation, compilers and operating system concepts (including concurrency mechanisms such as processes and threads and computer communication). Designed for graduate students without extensive undergraduate preparation in computer system engineering (or equivalent experience).

Prerequisite(s): programming experience with at least one high level language and permission of the Department.

**SYSC 5708 [0.5 credit] (ELG 6178)****Model-Driven Development of Real-Time and Distributed Software**

Advanced development of real-time and distributed systems by model-driven development that shifts the focus from coding to modeling. Different types of models. Generating code by model transformations. Design patterns for distributed/concurrent systems with examples from communication applications. Design issues for reusable software.

Prerequisite(s): knowledge of UML and operating systems concepts, and permission of the Department.

**SYSC 5709 [0.5 credit] (ELG 6179)****Advanced Topics in Software Engineering**

Recent and advanced topics in the field of software engineering and related areas. Primary references are recent publications in the field.

Prerequisite(s): permission of the Department.

**SYSC 5801 [0.5 credit] (ELG 6181)****Advanced Topics in Computer Communications**

Recent and advanced topics in computer-communication networks intended as a preparation for research. Students are expected to contribute to seminars or present lectures on selected topics.

Prerequisite(s): SYSC 5201(ELG 6121) or ELG 5374 (EACJ 5607) or equivalent and permission of the Department.

**SYSC 5804 [0.5 credit] (ELG 6184)****Advanced Topics in Communications Systems**

Recent and advanced topics in communications systems.

Prerequisite(s): permission of the Department.

**SYSC 5805 [0.5 credit]****Model-Driven Security Engineering**

Fundamentals of security engineering and its activities, with emphasis on model-driven approaches for asset identification, threat and risk assessment, security requirements elicitation, security controls selection, security evaluation, and security assurance for software intensive-systems. Examination of challenges for engineering secure software.

Includes: Experiential Learning Activity

**SYSC 5807 [0.5 credit] (ELG 6187)****Advanced Topics in Computer Systems**

Recent and advanced topics in computer systems.

The course will generally focus on one or more of the following areas: specification, design, implementation, and modeling/analysis. Students may be expected to contribute to lectures or seminars on selected topics.

Prerequisite(s): permission of the Department.

**SYSC 5809 [0.5 credit]****The Internet of Things**

Main concepts of the Internet of Things (IoT) ranging from the physical devices and sensor networks to the applications and standards.

Includes: Experiential Learning Activity

**SYSC 5900 [0.5 credit] (ELG 6188)****Systems Engineering Project**

Students pursuing the non-thesis M.Eng. program conduct an engineering study, analysis, and/or design project under the supervision of a faculty member.

Includes: Experiential Learning Activity

**SYSC 5902 [0.5 credit]****Research Methods for Engineers**

Topics required to perform engineering research including literature surveys, identifying issues, objectives, and methodology. Technical writing, documenting and presenting engineering ideas and a review of statistics, simulation, optimization and data analysis.

Includes: Experiential Learning Activity

**SYSC 5903 [0.5 credit]****Systems Engineering Project II**

Students pursuing the non-thesis M.Eng. program conduct an engineering study, analysis, and/or design project under the supervision of a faculty member.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**SYSC 5905 [2.0 credits] (ELG 6188)****M.C.S. Thesis**

Also listed as MATH 5905, COMP 5905.

**SYSC 5906 [0.5 credit]****Directed Studies****SYSC 5909 [2.5 credits]****M.A.Sc. Thesis**

Includes: Experiential Learning Activity

**SYSC 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Engineering Practice

### Master of Engineering - Engineering Practice (5.0 credits - coursework pathway) (5.25 credits - practicum pathway)

#### Master of Engineering - Civil Engineering Practice

##### Requirements - coursework pathway (5.0 credits)

##### 1. 2.0 credits from: 2.0

EGEN 5100 [0.5]	Reinforced and Prestressed Concrete Design
EGEN 5101 [0.5]	Design of Steel Structures
EGEN 5102 [0.5]	Masonry Behaviour and Design
EGEN 5103 [0.5]	Infrastructure and Pavement Management
EGEN 5104 [0.5]	Traffic Engineering
EGEN 5105 [0.5]	Foundation Engineering
EGEN 5106 [0.5]	Fundamentals of Fire Safety Engineering
EGEN 5107 [0.5]	Design for Fire Resistance
EGEN 5199 [0.5]	Special Topics in Civil Engineering
EGEN 5099 [0.5]	Directed Studies (with permission of program director only, and support of a full-time faculty member)

##### 2. 0.5 credit in: 0.5

ECMP 5000 [0.5]	Engineering Communications
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##### 3. 0.5 credit in: 0.5

ECMP 5001 [0.5]	Project Management
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##### 4. 0.5 credit in: 0.5

ECMP 5002 [0.5]	Research Methods for Engineering Practitioners
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##### 5. 1.5 credits from: 1.5

ECMP 5003 [0.5]	Entrepreneurship
ECMP 5004 [0.5]	Engineering Economics
ECMP 5005 [0.5]	Data Analytics
ECMP 5006 [0.5]	Governance, Policy Development and Decision-making
ECMP 5007 [0.5]	Climate Change and Sustainability
ECMP 5008 [0.5]	Risk Analysis
ECMP 5010 [0.5]	Professional and Ethical Practice for Engineers

##### 6. 0.0 credit in: 0.0

ECMP 5009 [0.0]	Research Seminar
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**Total Credits 5.0**

#### Master of Engineering - Civil Engineering Practice

##### Requirements - practicum pathway (5.25 credits)

##### 1. 2.0 credits from: 2.0

EGEN 5100 [0.5]	Reinforced and Prestressed Concrete Design
EGEN 5101 [0.5]	Design of Steel Structures
EGEN 5102 [0.5]	Masonry Behaviour and Design
EGEN 5103 [0.5]	Infrastructure and Pavement Management
EGEN 5104 [0.5]	Traffic Engineering
EGEN 5105 [0.5]	Foundation Engineering
EGEN 5106 [0.5]	Fundamentals of Fire Safety Engineering
EGEN 5107 [0.5]	Design for Fire Resistance

EGEN 5199 [0.5]	Special Topics in Civil Engineering
EGEN 5099 [0.5]	Directed Studies (with permission of the program director only, and support of a full-time faculty member)

##### 2. 0.5 credit in: 0.5

ECMP 5000 [0.5]	Engineering Communications
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##### 3. 0.5 credit in: 0.5

ECMP 5001 [0.5]	Project Management
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##### 4. 0.5 credit in: 0.5

ECMP 5002 [0.5]	Research Methods for Engineering Practitioners
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##### 5. 0.25 credit in: 0.25

EWEX 5000 [0.25]	Engineering Practicum Preparation
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##### 6. 1.5 credits from the following list, which must include at least one of EWEX 5001 or EWEX 5002: 1.5

ECMP 5003 [0.5]	Entrepreneurship
ECMP 5004 [0.5]	Engineering Economics
ECMP 5005 [0.5]	Data Analytics
ECMP 5006 [0.5]	Governance, Policy Development and Decision-making
ECMP 5007 [0.5]	Climate Change and Sustainability
ECMP 5008 [0.5]	Risk Analysis
ECMP 5010 [0.5]	Professional and Ethical Practice for Engineers

EWEX 5001 [0.5]	Engineering Practicum
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EWEX 5002 [0.5]	Engineering Practicum
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##### 7. 0.0 credit in: 0.0

ECMP 5009 [0.0]	Research Seminar
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**Total Credits 5.25**

#### Master of Engineering - Software Engineering Practice

##### Requirements - coursework pathway (5.0 credits)

##### 1. 2.0 credits from: 2.0

EGEN 5200 [0.5]	Operating Systems
EGEN 5201 [0.5]	Embedded Systems Development
EGEN 5202 [0.5]	Secure Systems Engineering
EGEN 5203 [0.5]	Test-driven and Agile Software Development

EGEN 5205 [0.5]	Software Development for Parallel and Distributed Architectures
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EGEN 5206 [0.5]	Web and Mobile Software Development
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EGEN 5208 [0.5]	Databases for Software Engineers
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EGEN 5209 [0.5]	Tools for Software Engineering
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EGEN 5210 [0.5]	Practical Introduction to Data Analysis and Machine Learning
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EGEN 5299 [0.5]	Special Topics in Software Engineering
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EGEN 5099 [0.5]	Directed Studies (with permission of program director only, and support of a full-time faculty member)
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##### 2. 0.5 credit in: 0.5

ECMP 5000 [0.5]	Engineering Communications
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##### 3. 0.5 credit in: 0.5

ECMP 5001 [0.5]	Project Management
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##### 4. 0.5 credit in: 0.5

ECMP 5002 [0.5]	Research Methods for Engineering Practitioners
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<b>5. 1.5 credits from:</b>	1.5
ECMP 5003 [0.5] Entrepreneurship	
ECMP 5004 [0.5] Engineering Economics	
ECMP 5005 [0.5] Data Analytics	
ECMP 5006 [0.5] Governance, Policy Development and Decision-making	
ECMP 5007 [0.5] Climate Change and Sustainability	
ECMP 5008 [0.5] Risk Analysis	
ECMP 5010 [0.5] Professional and Ethical Practice for Engineers	
<b>6. 0.0 credit in:</b>	0.0
ECMP 5009 [0.0] Research Seminar	
<b>Total Credits</b>	<b>5.0</b>
<b>Master of Engineering - Software Engineering Practice Requirements - practicum pathway (5.25 credits)</b>	
<b>1. 2.0 credits from:</b>	2.0
EGEN 5200 [0.5] Operating Systems	
EGEN 5201 [0.5] Embedded Systems Development	
EGEN 5202 [0.5] Secure Systems Engineering	
EGEN 5203 [0.5] Test-driven and Agile Software Development	
EGEN 5205 [0.5] Software Development for Parallel and Distributed Architectures	
EGEN 5206 [0.5] Web and Mobile Software Development	
EGEN 5208 [0.5] Databases for Software Engineers	
EGEN 5209 [0.5] Tools for Software Engineering	
EGEN 5210 [0.5] Practical Introduction to Data Analysis and Machine Learning	
EGEN 5299 [0.5] Special Topics in Software Engineering	
EGEN 5099 [0.5] Directed Studies (with permission of the program director only, and support of a full-time faculty member)	
<b>2. 0.5 credit in:</b>	0.5
ECMP 5000 [0.5] Engineering Communications	
<b>3. 0.5 credit in:</b>	0.5
ECMP 5001 [0.5] Project Management	
<b>4. 0.5 credit in:</b>	0.5
ECMP 5002 [0.5] Research Methods for Engineering Practitioners	
<b>5. 0.25 credit in:</b>	0.25
EWEX 5000 [0.25] Engineering Practicum Preparation	
<b>6. 1.5 credits from</b> the following list, which must include at least one of EWEX 5001 or EWEX 5002:	1.5
ECMP 5003 [0.5] Entrepreneurship	
ECMP 5004 [0.5] Engineering Economics	
ECMP 5005 [0.5] Data Analytics	
ECMP 5006 [0.5] Governance, Policy Development and Decision-making	
ECMP 5007 [0.5] Climate Change and Sustainability	
ECMP 5008 [0.5] Risk Analysis	
ECMP 5010 [0.5] Professional and Ethical Practice for Engineers	
EWEX 5001 [0.5] Engineering Practicum	
EWEX 5002 [0.5] Engineering Practicum	
<b>7. 0.0 credit in:</b>	

ECMP 5009 [0.0] Research Seminar	
<b>Total Credits</b>	<b>5.25</b>
<b>Master of Engineering - Electrical Engineering Practice Requirements - coursework pathway (5.0 credits)</b>	
<b>1. 2.0 credits from:</b>	2.0
EGEN 5300 [0.5] Signal Processing Electronics	
EGEN 5301 [0.5] VLSI Design	
EGEN 5302 [0.5] Modeling and Simulation of Electrical Circuits	
EGEN 5303 [0.5] Silicon Sensors	
EGEN 5304 [0.5] Microprocessor Systems	
EGEN 5305 [0.5] Power Systems	
EGEN 5306 [0.5] Telecommunications Systems	
EGEN 5307 [0.5] Control Systems and Robotics	
EGEN 5308 [0.5] Integrated Circuit and Device Technology	
EGEN 5399 [0.5] Special Topics in Electrical Engineering	
EGEN 5099 [0.5] Directed Studies (with permission of program director only, and support of a full-time faculty member)	
<b>2. 0.5 credit in:</b>	0.5
ECMP 5000 [0.5] Engineering Communications	
<b>3. 0.5 credit in:</b>	0.5
ECMP 5001 [0.5] Project Management	
<b>4. 0.5 credit in:</b>	0.5
ECMP 5002 [0.5] Research Methods for Engineering Practitioners	
<b>5. 1.5 credits from:</b>	1.5
ECMP 5003 [0.5] Entrepreneurship	
ECMP 5004 [0.5] Engineering Economics	
ECMP 5005 [0.5] Data Analytics	
ECMP 5006 [0.5] Governance, Policy Development and Decision-making	
ECMP 5007 [0.5] Climate Change and Sustainability	
ECMP 5008 [0.5] Risk Analysis	
ECMP 5010 [0.5] Professional and Ethical Practice for Engineers	
<b>6. 0.0 credit in:</b>	0.0
ECMP 5009 [0.0] Research Seminar	
<b>Total Credits</b>	<b>5.0</b>
<b>Master of Engineering - Electrical Engineering Practice Requirements - practicum pathway (5.25 credits)</b>	
<b>1. 2.0 credits from:</b>	2.0
EGEN 5300 [0.5] Signal Processing Electronics	
EGEN 5301 [0.5] VLSI Design	
EGEN 5302 [0.5] Modeling and Simulation of Electrical Circuits	
EGEN 5303 [0.5] Silicon Sensors	
EGEN 5304 [0.5] Microprocessor Systems	
EGEN 5305 [0.5] Power Systems	
EGEN 5306 [0.5] Telecommunications Systems	
EGEN 5307 [0.5] Control Systems and Robotics	
EGEN 5308 [0.5] Integrated Circuit and Device Technology	

EGEN 5399 [0.5]	Special Topics in Electrical Engineering	
EGEN 5099 [0.5]	Directed Studies (with permission of the program director only, and support of a full-time faculty member)	
<b>2. 0.5 credit in:</b>		0.5
ECMP 5000 [0.5]	Engineering Communications	
<b>3. 0.5 credit in:</b>		0.5
ECMP 5001 [0.5]	Project Management	
<b>4. 0.5 credit in:</b>		0.5
ECMP 5002 [0.5]	Research Methods for Engineering Practitioners	
<b>5. 0.25 credit in:</b>		0.25
EWEX 5000 [0.25]	Engineering Practicum Preparation	
<b>6. 1.5 credits from</b>	the following list, which must include at least one of EWEX 5001 or EWEX 5002:	1.5
ECMP 5003 [0.5]	Entrepreneurship	
ECMP 5004 [0.5]	Engineering Economics	
ECMP 5005 [0.5]	Data Analytics	
ECMP 5006 [0.5]	Governance, Policy Development and Decision-making	
ECMP 5007 [0.5]	Climate Change and Sustainability	
ECMP 5008 [0.5]	Risk Analysis	
ECMP 5010 [0.5]	Professional and Ethical Practice for Engineers	
EWEX 5001 [0.5]	Engineering Practicum	
EWEX 5002 [0.5]	Engineering Practicum	
<b>7. 0.0 credit in:</b>		0.0
ECMP 5009 [0.0]	Research Seminar	
<b>Total Credits</b>		<b>5.25</b>

#### Master of Engineering - Environmental Engineering Practice

##### Requirements - coursework pathway (5.0 credits)

<b>1. 2.0 credits from:</b>		2.0
EGEN 5400 [0.5]	Overview of Environmental Engineering Principles	
EGEN 5401 [0.5]	Physico-Chemical Processes in Water and Wastewater Treatment	
EGEN 5402 [0.5]	Biological Processes in Water and Wastewater Treatment	
EGEN 5403 [0.5]	Groundwater and Soil Remediation	
EGEN 5404 [0.5]	Solid Wastes and Landfill	
EGEN 5405 [0.5]	Air Pollution and Emission Control	
EGEN 5406 [0.5]	Climate Change and Engineering	
EGEN 5407 [0.5]	Environmental Impact Assessment	
EGEN 5499 [0.5]	Special Topics in Environmental Engineering	
EGEN 5099 [0.5]	Directed Studies (with permission of program director only, and support of a full-time faculty member)	
<b>2. 0.5 credit in:</b>		0.5
ECMP 5000 [0.5]	Engineering Communications	
<b>3. 0.5 credit in:</b>		0.5
ECMP 5001 [0.5]	Project Management	
<b>4. 0.5 credit in:</b>		0.5
ECMP 5002 [0.5]	Research Methods for Engineering Practitioners	

<b>5. 1.5 credits from:</b>		1.5
ECMP 5003 [0.5]	Entrepreneurship	
ECMP 5004 [0.5]	Engineering Economics	
ECMP 5005 [0.5]	Data Analytics	
ECMP 5006 [0.5]	Governance, Policy Development and Decision-making	
ECMP 5007 [0.5]	Climate Change and Sustainability	
ECMP 5008 [0.5]	Risk Analysis	
ECMP 5010 [0.5]	Professional and Ethical Practice for Engineers	
<b>6. 0.0 credit in:</b>		0.0
ECMP 5009 [0.0]	Research Seminar	
<b>Total Credits</b>		<b>5.0</b>

#### Master of Engineering - Environmental Engineering Practice

##### Requirements - practicum pathway (5.25 credits)

<b>1. 2.0 credits from:</b>		2.0
EGEN 5400 [0.5]	Overview of Environmental Engineering Principles	
EGEN 5401 [0.5]	Physico-Chemical Processes in Water and Wastewater Treatment	
EGEN 5402 [0.5]	Biological Processes in Water and Wastewater Treatment	
EGEN 5403 [0.5]	Groundwater and Soil Remediation	
EGEN 5404 [0.5]	Solid Wastes and Landfill	
EGEN 5405 [0.5]	Air Pollution and Emission Control	
EGEN 5406 [0.5]	Climate Change and Engineering	
EGEN 5407 [0.5]	Environmental Impact Assessment	
EGEN 5499 [0.5]	Special Topics in Environmental Engineering	
EGEN 5099 [0.5]	Directed Studies (with permission of the program director only, and support of a full-time faculty member)	
<b>2. 0.5 credit in:</b>		0.5
ECMP 5000 [0.5]	Engineering Communications	
<b>3. 0.5 credit in:</b>		0.5
ECMP 5001 [0.5]	Project Management	
<b>4. 0.5 credit in:</b>		0.5
ECMP 5002 [0.5]	Research Methods for Engineering Practitioners	
<b>5. 0.25 credit in:</b>		0.25
EWEX 5000 [0.25]	Engineering Practicum Preparation	
<b>6. 1.5 credits from</b>	the following list, which must include at least one of EWEX 5001 or EWEX 5002:	1.5
ECMP 5003 [0.5]	Entrepreneurship	
ECMP 5004 [0.5]	Engineering Economics	
ECMP 5005 [0.5]	Data Analytics	
ECMP 5006 [0.5]	Governance, Policy Development and Decision-making	
ECMP 5007 [0.5]	Climate Change and Sustainability	
ECMP 5008 [0.5]	Risk Analysis	
ECMP 5010 [0.5]	Professional and Ethical Practice for Engineers	
EWEX 5001 [0.5]	Engineering Practicum	
EWEX 5002 [0.5]	Engineering Practicum	
<b>7. 0.0 credit in:</b>		0.0

ECMP 5009 [0.0]	Research Seminar	
<b>Total Credits</b>		<b>5.25</b>
<b>Master of Engineering - Mechanical Engineering Practice</b>		
<b>Requirements - coursework pathway (5.0 credits)</b>		
<b>1. 2.0 credits from:</b>		<b>2.0</b>
EGEN 5500 [0.5]	Applied Fluid Mechanics	
EGEN 5501 [0.5]	Computational Fluid Mechanics	
EGEN 5502 [0.5]	Thermodynamics and Energy Systems	
EGEN 5503 [0.5]	Transport Phenomena (Heat and Mass)	
EGEN 5504 [0.5]	Kinematics and Dynamics of Human Movement	
EGEN 5505 [0.5]	Controls and Robotics	
EGEN 5506 [0.5]	Mechanics and Fracture	
EGEN 5507 [0.5]	Surfaces and Interfacial Phenomena	
EGEN 5508 [0.5]	Introduction to Advanced Materials	
EGEN 5509 [0.5]	Engineering Vibrations	
EGEN 5599 [0.5]	Special Topics in Mechanical Engineering	
EGEN 5099 [0.5]	Directed Studies (with permission of program director only, and support of a full-time faculty member)	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
ECMP 5000 [0.5]	Engineering Communications	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
ECMP 5001 [0.5]	Project Management	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
ECMP 5002 [0.5]	Research Methods for Engineering Practitioners	
<b>5. 1.5 credits from:</b>		<b>1.5</b>
ECMP 5003 [0.5]	Entrepreneurship	
ECMP 5004 [0.5]	Engineering Economics	
ECMP 5005 [0.5]	Data Analytics	
ECMP 5006 [0.5]	Governance, Policy Development and Decision-making	
ECMP 5007 [0.5]	Climate Change and Sustainability	
ECMP 5008 [0.5]	Risk Analysis	
ECMP 5010 [0.5]	Professional and Ethical Practice for Engineers	
<b>6. 0.0 credit in:</b>		<b>0.0</b>
ECMP 5009 [0.0]	Research Seminar	
<b>Total Credits</b>		<b>5.0</b>
<b>Master of Engineering - Mechanical Engineering Practice</b>		
<b>Requirements - practicum pathway (5.25 credits)</b>		
<b>1. 2.0 credits from:</b>		<b>2.0</b>
EGEN 5500 [0.5]	Applied Fluid Mechanics	
EGEN 5501 [0.5]	Computational Fluid Mechanics	
EGEN 5502 [0.5]	Thermodynamics and Energy Systems	
EGEN 5503 [0.5]	Transport Phenomena (Heat and Mass)	
EGEN 5504 [0.5]	Kinematics and Dynamics of Human Movement	

EGEN 5505 [0.5]	Controls and Robotics	
EGEN 5506 [0.5]	Mechanics and Fracture	
EGEN 5507 [0.5]	Surfaces and Interfacial Phenomena	
EGEN 5508 [0.5]	Introduction to Advanced Materials	
EGEN 5509 [0.5]	Engineering Vibrations	
EGEN 5599 [0.5]	Special Topics in Mechanical Engineering	
EGEN 5099 [0.5]	Directed Studies (with permission of the program director only, and support of a full-time faculty member)	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
ECMP 5000 [0.5]	Engineering Communications	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
ECMP 5001 [0.5]	Project Management	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
ECMP 5002 [0.5]	Research Methods for Engineering Practitioners	
<b>5. 0.25 credit in:</b>		<b>0.25</b>
EWEX 5000 [0.25]	Engineering Practicum Preparation	
<b>6. 1.5 credits from the following list, which must include at least one of EWEX 5001 or EWEX 5002:</b>		<b>1.5</b>
ECMP 5003 [0.5]	Entrepreneurship	
ECMP 5004 [0.5]	Engineering Economics	
ECMP 5005 [0.5]	Data Analytics	
ECMP 5006 [0.5]	Governance, Policy Development and Decision-making	
ECMP 5007 [0.5]	Climate Change and Sustainability	
ECMP 5008 [0.5]	Risk Analysis	
ECMP 5010 [0.5]	Professional and Ethical Practice for Engineers	
EWEX 5001 [0.5]	Engineering Practicum	
EWEX 5002 [0.5]	Engineering Practicum	
<b>7. 0.0 credit in:</b>		<b>0.0</b>
ECMP 5009 [0.0]	Research Seminar	
<b>Total Credits</b>		<b>5.25</b>

## Admission

The requirement for admission to the M. Engineering - Engineering Practice is a four-year bachelor's degree in civil, computer, electrical, environmental, mechanical engineering, or software (students with other engineering degree disciplines should contact the Faculty for special consideration) from an institution recognized by Engineers Canada under the Washington Accord, with an average of at least B+. Applicants should note that simply meeting the minimum standards for admission will not guarantee admission to the program as there are only a limited number of positions available each year.

## Transfer and Transfer Credit

Graduate students currently registered in other graduate programs in Engineering at Carleton University, and who hold a four-year bachelor's degree in engineering from an institution recognized by Engineers Canada under the Washington Accord can transfer into this program. Transfer credit will be awarded for courses where a grade of B or higher was earned in other graduate programs in

Engineering at Carleton University towards the fulfilment of discipline specific Engineering course requirements.

## **Regulations**

See the General Regulations section of this Calendar.

## **Regularly Scheduled Break**

For immigration purposes, the summer term (May to August) for the Master of Engineering - Engineering Practice is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## **Engineering Complementary Courses (ECMP) Courses**

### **ECMP 5000 [0.5 credit]**

#### **Engineering Communications**

Designed to advance the student's ability to communicate technical ideas and conclusions effectively to peers and stakeholders. The course is divided into three sections involving the principles and practice of written, verbal, and graphical communication modes.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

### **ECMP 5001 [0.5 credit]**

#### **Project Management**

Introduction to project management tools, techniques, templates, and methodologies. This course examines the eight knowledge areas of the Project Management Institute (PMI) which provide an integrated approach to managing engineering projects.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

### **ECMP 5002 [0.5 credit]**

#### **Research Methods for Engineering Practitioners**

The course focuses on equipping students with the skills to carry out R&D projects while integrating advanced tools like AI in an ethical way in this rapidly changing landscape. The course remains flexible to accommodate evolving technologies and industry needs.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

### **ECMP 5003 [0.5 credit]**

#### **Entrepreneurship**

Introduction to the conceptual and practical considerations in developing new products. The theory and practice of project management, innovation and entrepreneurship, business planning, marketing, and mobilizing human and financial resources applied to the creation of new business activities and ventures will be discussed.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

### **ECMP 5004 [0.5 credit]**

#### **Engineering Economics**

The application of engineering economics, financial analysis and market assessment to engineering alternatives in the planning, development and ongoing management of industrial enterprises.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

### **ECMP 5005 [0.5 credit]**

#### **Data Analytics**

Introduction to data analytics, including visualization and knowledge discovery in massive datasets; unsupervised learning: clustering algorithms; dimension reduction; supervised learning: pattern recognition, smoothing techniques, classification. Computer software will be used.

Prerequisite(s): enrolment in the M.Eng. - Engineering Practice program.

### **ECMP 5006 [0.5 credit]**

#### **Governance, Policy Development and Decision-making**

Provide a foundational knowledge level of key governance structures and political institutions at the Canadian federal, provincial, and municipal levels, as well as Indigenous structures. Scholarship on policy development, strategic thinking and decision making is introduced, along with the role of information.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

### **ECMP 5007 [0.5 credit]**

#### **Climate Change and Sustainability**

The complex and multifaceted elements of climate change and sustainable living are introduced in terms of the humanities, sciences, engineering, business and public policy perspectives, as well as root causes and potential adaptive responses.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**ECMP 5008 [0.5 credit]****Risk Analysis**

The challenge of living and operating responsibly within a finite level of risk is a ubiquitous aspect of engineered systems. A framework for the identification and evaluation of risk is provided through examples, and discussions include means to manage ongoing risk.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**ECMP 5009 [0.0 credit]****Research Seminar**

A series of invited lectures to present the motivation, methodologies, results, and societal implications of ongoing engineering research projects occurring within the Faculty. Graded SAT/UNS.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**ECMP 5010 [0.5 credit]****Professional and Ethical Practice for Engineers**

This course adapts to current industry challenges and emerging ethical issues, providing students with a broad understanding of professional responsibility in areas such as public safety, AI, sustainability, and technological ethics.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**Engineering General (EGEN) Courses****EGEN 5099 [0.5 credit]****Directed Studies**

Independent research project supervised by a full time faculty member who will provide mentorship for the project.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5100 [0.5 credit]****Reinforced and Prestressed Concrete Design**

Introduction to design of reinforced and prestressed concrete elements using CSA A23.3. Behaviour and design of beams, columns and slabs. Prestressed concrete concepts including flexural analysis, shear, deflections and prestress loss.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5101 [0.5 credit]****Design of Steel Structures**

Introduction to CAN/CSA - S16, design and behaviour concepts; shear lag, block shear, local plate buckling, lateral torsional buckling, inelastic strength and stability. Design of tension members, axially loaded columns, beams, composite beams, plate girders, stability of structures and members.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5102 [0.5 credit]****Masonry Behaviour and Design**

Introduction to design of reinforced masonry using CSA S304. Properties of masonry materials and assemblages. Behaviour and design of walls, beams and columns. Applications to low-rise construction.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5103 [0.5 credit]****Infrastructure and Pavement Management**

Advanced pavement management, network and project level management, data collection and management, pavement evaluation, pavement design, rehabilitation and maintenance, pavement performance models, life cycle analysis, implementation of pavement management systems, future directions and research needs.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5104 [0.5 credit]****Traffic Engineering**

Traffic control devices, signal warrants, principles of signalized intersection design, signal timing and components, signal optimization and coordination, traffic delay estimation, actuated control, freeway access control.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5105 [0.5 credit]****Foundation Engineering**

Review of methods of estimating the shear strength of soils; use of in-situ testing for design purposes; bearing capacity and performance of shallow and deep foundations; pile groups.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5106 [0.5 credit]****Fundamentals of Fire Safety Engineering**

Explores the fire safety system, covering performance-based design, heat transfer, fire development, active fire protection systems, evacuation, life hazard assessment, wildland fires, fire investigation, and fire risk analysis. Compliance with building codes and standards is integrated.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5107 [0.5 credit]****Design for Fire Resistance**

Fire safety in buildings, fire and heat, compartment fires; pre- and post-flashover fires; design fires; behaviour of materials and structures at elevated temperatures; fire-resistance tests; fire-resistance ratings; building code requirements; real-world fires; assessing the fire resistance of steel, concrete, and wood building assemblies.

Prerequisite(s): enrolment in the M.Eng.- Civil Engineering Practice program.

**EGEN 5199 [0.5 credit]****Special Topics in Civil Engineering**

The course tackles specific issues within the field of civil engineering that may not be covered by existing approved courses.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5200 [0.5 credit]****Operating Systems**

Introduction to operating system principles. Structure of an operating system; management of CPU, processes, and memory; dead-lock problems, file systems. Concurrent programming.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5201 [0.5 credit]****Embedded Systems Development**

Applications of embedded systems and challenges of embedded systems design; embedded processors, embedded reconfigurable hardware, embedded software; specification, modeling, design and verification of embedded systems; real time systems; construction of event-driven systems; performance issues; practical examples.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Computer or Software Engineering or permission of the Director.

**EGEN 5202 [0.5 credit]****Secure Systems Engineering**

Causes and consequences of computer system failure. Structure of fault-tolerant computer systems. Methods for protecting software and data against computer failure. Quantification of system reliability. Introduction to formal methods for safety-critical systems. Computer and computer network security.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Computer or Software Engineering or permission of the Director.

**EGEN 5203 [0.5 credit]****Test-driven and Agile Software Development**

Practice of object-oriented design principles, design patterns, object-oriented frameworks, refactoring, unit-testing, test-driven development, Agile software development principles.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5205 [0.5 credit]****Software Development for Parallel and Distributed Architectures**

Advanced parallel programming and distributed systems, and high-performance computing in engineering. Both shared-memory parallel computers and distributed-memory multicomputers are considered. Aspects of the practice of parallelism will be covered. Emphasis is on thread programming, data-parallel programming, and performance evaluation.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Computer or Software Engineering or permission of the Director.

**EGEN 5206 [0.5 credit]****Web and Mobile Software Development**

Developing web and mobile applications. Topics include: client-side/mobile programming language, development tools, graphical user interface patterns (e.g., event-driven programming, separation of content and presentation, layout policies) and framework, interactions with the server-side.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5208 [0.5 credit]****Databases for Software Engineers**

The relational database model and its logical underpinnings, mapping requirements to a database schema, the Entity-Relationship model, normalization, joins, SQL, indexes and views, transactions, object-relational mapping, migrations, noSQL databases.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5209 [0.5 credit]****Tools for Software Engineering**

Proficiency with everyday software engineering tools: the command line, shell tools and scripting, text processing (regular expressions, grep, sed, awk), basic text editors (vim), graphing (gnuplot/matplotlib, graphviz), version control (git), networking tools (telnet, ssh, scp, curl), build and package management tools (make, apt-get).

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5210 [0.5 credit]****Practical Introduction to Data Analysis and Machine Learning**

Tabular data exploration and visualization (pandas, matplotlib), data-fitting basics (scikit-learn), k-nearest neighbours, linear regression, decision trees, data pre-processing, model evaluation metrics, overfitting vs underfitting, bias/variance, cross-validation, introduction to neural networks, hyperparameter tuning, feature selection, feature importance.

Prerequisite(s): enrolment in the M.Eng.- Software Engineering Practice program.

**EGEN 5299 [0.5 credit]****Special Topics in Software Engineering**

The course tackles specific issues within the field of software engineering that may not be covered by existing approved courses.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5300 [0.5 credit]****Signal Processing Electronics**

Overview of analysis and design of analog and mixed-signal circuit building blocks in continuous- and discrete-time signal processing. Topics: analysis and design of continuous-time filters; discrete-time signal analysis using z-transform; discrete-time filter design; fundamental techniques for digital-to-analog and analog-to-digital converters.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5301 [0.5 credit]****VLSI Design**

Very Large-Scale Integration (VLSI) design techniques and their application. CMOS devices and technology. Modular Design Approach and use of CAD tools in an integrated circuit design flow. Building blocks of CMOS analog and digital circuits. Advanced digital logic circuit techniques.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5302 [0.5 credit]****Modeling and Simulation of Electrical Circuits**

Basic principles of Computer-Aided Design tools used for analysis and design of VLSI circuits and systems. Automated formulation of circuit equations, Frequency, DC and time-domain analysis. Noise and distortion analysis. Interconnect analysis. Sensitivity analysis, and circuit performance optimization.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5303 [0.5 credit]****Silicon Sensors**

Overview of sensor technologies with emphasis on devices suitable for integration with silicon integrated circuits. Sensor design and signal conditioning. Sensor circuitry and adaptations for automotive, biomedical, and other instrumentation applications.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5304 [0.5 credit]****Microprocessor Systems**

Interfacing aspects in microprocessor systems. Microprocessors and bus structures, internal architecture, instruction set and pin functions. Memory interfacing, input-output, interrupts, direct memory accesses, special processors and multiprocessor systems.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5305 [0.5 credit]****Power Systems**

Introduction to power system and their transient states. Power system voltage stability; PV and QV curve methods. Power system angular stability; transient stability and equal area criterion; steady-state stability and power system stabilizer. Electromagnetic transients in power systems, insulation coordination and equipment protection.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Electrical Engineering or permission of the Director.

**EGEN 5306 [0.5 credit]****Telecommunications Systems**

Communications fundamentals including decibel, intermodulation, 1dB compression, dynamic range, SNR, noise figure, noise temperature, antenna gain, EIRP, G/T. Links; transceiver architecture, diversity, fade margin, link calculations, multiple accessing.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5307 [0.5 credit]****Control Systems and Robotics**

Fundamental aspects of modeling and control of robot manipulators as devices that involve electronics and mechanics (kinematics and dynamics), electronic actuators, information theory, automation. Principles of proximity, tactile, and force sensing. Programming platforms and languages. Automation strategies.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5308 [0.5 credit]****Integrated Circuit and Device Technology**

Survey of technology used in silicon VLSI integrated circuit fabrication. Crystal growth and crystal defects, oxidation, diffusion, ion implantation and annealing, gettering, CVD, etching, materials for metallization and contacting, and photolithography. Structures and fabrication techniques required for submicron MOSFETs. Applications in advanced CMOS processes.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5399 [0.5 credit]****Special Topics in Electrical Engineering**

The course tackles specific issues within the field of electrical engineering that may not be covered by existing approved courses.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5400 [0.5 credit]****Overview of Environmental Engineering Principles**

Basic mechanisms of chemistry, biology, and physics relevant to environmental engineering. Principles of equilibrium, mass transfer, material balances, microbial growth, water, energy, and nutrient cycles. Applications to environmental systems as biological degradation, mass and energy movement, and design of water and wastewater treatment systems.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Environmental Engineering or permission of the Director.

**EGEN 5401 [0.5 credit]****Physico-Chemical Processes in Water and Wastewater Treatment**

Theory and design of chemical and physical unit processes utilized in the treatment of water and wastewater, sedimentation, flotation, coagulation, precipitation, filtration, disinfection, ion exchange, reverse osmosis, adsorption, and gas transfer.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5402 [0.5 credit]****Biological Processes in Water and Wastewater Treatment**

Study of the theoretical and applied aspects of wastewater treatment by activated sludge, fixed and moving biological films, conventional and aerated lagoons, sludge digestion, septic tanks, land treatment, and nutrient removal. Guidelines, regulations and economics. System analysis and design of facilities.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Environmental Engineering or permission of the Director.

**EGEN 5403 [0.5 credit]****Groundwater and Soil Remediation**

Principles of groundwater chemistry, the chemical evolution of natural groundwater flow systems, sources of contamination, and mass transport processes. Hydrogeologic aspects of waste disposal and groundwater remediation.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Environmental Engineering or permission of the Director.

**EGEN 5404 [0.5 credit]****Solid Wastes and Landfill**

Principles of solid waste management to protect public health. Study of solid waste components, refuse collection, storage, and handling. Design and operation of solid waste transfer and disposal facilities including transfer stations, resource recovery and composting facilities, incinerators, and landfills.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Environmental Engineering or permission of the Director.

**EGEN 5405 [0.5 credit]****Air Pollution and Emission Control**

Types of gaseous and particulate pollutants and their sources, effects of air pollution on man, vegetation, and materials, indoor air pollution, sampling and analysis of air pollutants, air pollution meteorology and dispersion, control techniques for gaseous and particulate pollutants, and air quality management aspects.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Environmental Engineering or permission of the Director.

**EGEN 5406 [0.5 credit]****Climate Change and Engineering**

Current and projected impacts of climate change on the circumpolar north, including the land, its biota, northern communities, drivers that shape these interactions, as well as how these impact engineered structures.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Environmental Engineering or permission of the Director.

**EGEN 5407 [0.5 credit]****Environmental Impact Assessment**

Principles and elements of environmental assessment with an interdisciplinary focus. Topics include types of environmental assessments, when to use them, data required, sampling strategies, how data should be collected and analyzed and ultimately communicated to pass legal and scientific scrutiny.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Environmental Engineering or permission of the Director.

**EGEN 5499 [0.5 credit]****Special Topics in Environmental Engineering**

The course tackles specific issues within the field of environmental engineering that may not be covered by existing approved courses.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5500 [0.5 credit]****Applied Fluid Mechanics**

Kinematics of fluid motion, fundamental fluid equations and concepts, laminar boundary layers, potential flow, stability and transition, introduction to turbulence, practical examples in mechanical engineering.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Mechanical Engineering or permission of the Director.

**EGEN 5501 [0.5 credit]****Computational Fluid Mechanics**

Solutions of the transport equations of momentum, mass, and energy. Transport processes are reviewed but emphasis is placed on the numerical solution of the governing differential equations. Different solution methodologies and software.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Mechanical Engineering or permission of the Director.

**EGEN 5502 [0.5 credit]****Thermodynamics and Energy Systems**

Principles of thermodynamics; properties of homogeneous fluid phases; phase and chemical equilibria; application to industrial and energy problems.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Mechanical Engineering or permission of the Director.

**EGEN 5503 [0.5 credit]****Transport Phenomena (Heat and Mass)**

Transport expressions for physical properties are combined with conservation laws to yield generalized equations used to solve a variety of engineering problems in fluid mechanics, and heat and mass transfer; steady-state and transient cases; special topics in non-Newtonian flow and forced diffusion.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Mechanical Engineering or permission of the Director.

**EGEN 5504 [0.5 credit]****Kinematics and Dynamics of Human Movement**

Kinematics and dynamics of rigid bodies moving in three dimensions. Spatial kinematics of rigid bodies, Euler angles, tensor of inertia and the Newton-Euler equations of motion for rigid bodies.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5505 [0.5 credit]****Controls and Robotics**

Introduction to advanced robotics including mobile robots, redundant manipulators, walking robots, aerial and marine autonomous vehicles. Kinematic and dynamic models for advanced robots. Linear and nonlinear control theory overview with applications to advanced robots.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Mechanical Engineering or permission of the Director.

**EGEN 5506 [0.5 credit]****Mechanics and Fracture**

Basic concepts of linear and nonlinear fracture mechanics: linear and nonlinear stationary crack-tip stress, strain and displacement fields; energy balance and energy release rates; fracture resistance concepts-static and dynamic fracture toughness; criteria for crack growth; fracture control methodology and applications.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Mechanical Engineering or permission of the Director.

**EGEN 5507 [0.5 credit]****Surfaces and Interfacial Phenomena**

Basics of colloid and interfacial phenomena with application to the energy sector, materials, processing, and biomedical industry.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program and an undergraduate degree in Mechanical Engineering or permission of the Director.

**EGEN 5508 [0.5 credit]****Introduction to Advanced Materials**

Introduction to advanced materials focusing on emerging materials like fibre-reinforced composite materials. Manufacturing methods of lightweight, safe and environment-friendly structures and their use in the industry. Standard analytical techniques (Micro and Macro approach) for materials' mechanical characterization and strength theories. Failure analysis of composites.

Includes: Experiential Learning Activity

**EGEN 5509 [0.5 credit]****Engineering Vibrations**

Vibration analysis of free-response damped and undamped single-degree-of-freedom (SDOF) systems. Harmonic excitation and general forced response. The eigenvalue problem and modal analysis for multi-degree-of-freedom (MDOF) systems. Vibration isolation and suppression. Distributed parameter systems. Analytical and Numerical methods.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EGEN 5599 [0.5 credit]****Special Topics in Mechanical Engineering**

The course tackles specific issues within the field of mechanical engineering that may not be covered by existing approved courses.

Prerequisite(s): enrolment in the M.Eng.- Engineering Practice program.

**EWEX (EWEX) Courses****EWEX 5000 [0.25 credit]****Engineering Practicum Preparation**

Mandatory course for the Engineering Practice Practicum pathway. Introduces students to the Engineering Practicum terms, job search, application, and interview processes while preparing students for the transition from university to a professional work environment. Graded SAT/UNSAT.

Prerequisite(s): successful completion of at least 1.5 credits, including at least one EGEN course and either ECMP 5000 or ECMP 5001; a minimum grade of B+ in all EGEN and ECMP courses; full-time registration in each academic term prior to a work term; for the duration of the practicum placements, be eligible to work in Canada (for off-campus work terms).

**EWEX 5001 [0.5 credit]****Engineering Practicum**

Students must be enrolled in this course during their first practicum term. A written report from the student and an assessment from the employer will be required. Graded SAT/UNS.

Includes: Experiential Learning Activity

Prerequisite(s): EWEX 5000.

**EWEX 5002 [0.5 credit]****Engineering Practicum**

Students must be enrolled in this course during their second practicum term, which is optional for the Practicum pathway. A written report from student and an assessment from the employer will be required. Graded SAT/UNS.

Includes: Experiential Learning Activity

Prerequisite(s): EWEX 5000.

## English

This section presents the requirements for programs in:

- **M.A. English**
- **M.A. English with Collaborative Specialization in African Studies**
- **M.A. English with Collaborative Specialization in Climate Change**
- **M.A. English with Collaborative Specialization in Digital Humanities**
- **Ph.D. English**
- **Ph.D. English with Collaborative Specialization in African Studies**

### Program Requirements

#### M.A. English (4.5 credits)

##### Requirements - Coursework pathway (4.5 credits)

1. <b>4.0 credits in ENGL</b> at the 5000 level (excluding ENGL 5908 and ENGL 5909)	4.0
2. <b>0.5 credit in:</b>	0.5
ENGL 5005 [0.5]    M.A. Seminar	

**Total Credits** **4.5**

##### Requirements - Research Essay pathway (4.5 credits)

1. <b>3.0 credits in ENGL</b> at the 5000 level (excluding ENGL 5909)	3.0
2. <b>0.5 credit in:</b>	0.5
ENGL 5005 [0.5]    M.A. Seminar	
3. <b>1.0 credit in:</b>	1.0
ENGL 5908 [1.0]    Research Essay	

**Total Credits** **4.5**

##### Requirements - Thesis pathway (4.5 credits)

1. <b>2.0 credits in ENGL</b> at the 5000 level (excluding ENGL 5908)	2.0
2. <b>0.5 credit in ENGL 5005</b>	0.5
3. <b>2.0 credits in:</b>	2.0
ENGL 5909 [2.0]    M.A. Thesis	

An oral examination on the thesis will be required. A prospectus for the thesis must be submitted to the graduate committee by December 1 after registration in September, or at the end of three months for any other registration

**Total Credits** **4.5**

#### M.A. English with Collaborative Specialization in African Studies (4.5 credits)

##### Requirements - Coursework pathway (4.5 credits)

1. <b>0.5 credit in:</b>	0.5
AFRI 5000 [0.5]    African Studies as a Discipline: Historical and Current Perspectives	
2. <b>0.0 credit in:</b>	0.0
AFRI 5800 [0.0]    Scholarly Preparation in African Studies	
3. <b>0.5 credit from:</b>	0.5
ENGL 5008 [0.5]    Studies in African Literature	
ENGL 5010 [0.5]    Studies in Caribbean Literature	

Or an ENGL course approved by the Graduate Coordinator of the Institute of African Studies

4. <b>0.5 credit in:</b>	0.5
ENGL 5005 [0.5]    M.A. Seminar	
5. <b>3.0 credits in ENGL</b> at the 5000 level (excluding ENGL 5908 and ENGL 5909)	3.0
<b>Total Credits</b>	<b>4.5</b>

##### Requirements - Research Essay pathway (4.5 credits)

1. <b>0.5 credit in:</b>	0.5
AFRI 5000 [0.5]    African Studies as a Discipline: Historical and Current Perspectives	
2. <b>0.0 credit in:</b>	0.0
AFRI 5800 [0.0]    Scholarly Preparation in African Studies	

3. <b>0.5 credit from:</b>	0.5
ENGL 5008 [0.5]    Studies in African Literature	
ENGL 5010 [0.5]    Studies in Caribbean Literature	
Or an ENGL course approved by the Graduate Coordinator of the Institute of African Studies	

4. <b>0.5 credit in:</b>	0.5
ENGL 5005 [0.5]    M.A. Seminar	
5. <b>2.0 credits in ENGL</b> at the 5000 level (excluding ENGL 5909)	2.0
6. <b>1.0 credit in:</b>	1.0
ENGL 5908 [1.0]    Research Essay (in the specialization)	

**Total Credits** **4.5**

##### Requirements - Thesis pathway (4.5 credits)

1. <b>0.5 credit in:</b>	0.5
AFRI 5000 [0.5]    African Studies as a Discipline: Historical and Current Perspectives	
2. <b>0.0 credit in:</b>	0.0
AFRI 5800 [0.0]    Scholarly Preparation in African Studies	

3. <b>0.5 credit from:</b>	0.5
ENGL 5008 [0.5]    Studies in African Literature	
ENGL 5010 [0.5]    Studies in Caribbean Literature	
Or an ENGL course approved by the Graduate Coordinator of the Institute of African Studies	

4. <b>0.5 credit in:</b>	0.5
ENGL 5005 [0.5]    M.A. Seminar	
5. <b>1.0 credit in ENGL</b> at the 5000 level (excluding ENGL 5908)	1.0
6. <b>2.0 credits in:</b>	2.0
ENGL 5909 [2.0]    M.A. Thesis (in the specialization)	

**Total Credits** **4.5**

#### M.A. English with Collaborative Specialization in Climate Change (4.5 credits)

##### Requirements - Coursework pathway (4.5 credits)

1. <b>1.0 credit in:</b>	1.0
CLIM 5000 [1.0]    Climate Collaboration	
2. <b>0.0 credit in:</b>	
CLIM 5800 [0.0]    Climate Seminar Series	
3. <b>2.5 credits in ENGL</b> at the 5000-level (excluding ENGL 5908 and ENGL 5909)	2.5

**4. 0.5 credit in** a graduate seminar with sufficient Climate Change content in ENGL or another department, as approved by the Coordinator of the Climate Change Specialization. 0.5

**5. 0.5 credit in:** 0.5  
ENGL 5005 [0.5] M.A. Seminar

**Total Credits** 4.5

#### Requirements - Research essay pathway (4.5 credits)

**1. 1.0 credit in:** 1.0  
CLIM 5000 [1.0] Climate Collaboration

**2. 0.0 credit in:**  
CLIM 5800 [0.0] Climate Seminar Series

**3. 0.5 credit in:** 0.5  
ENGL 5005 [0.5] M.A. Seminar

**4. 2.0 credits in** ENGL at the 5000 level (excluding ENGL 5908) 2.0

**5. 1.0 credit in:** 1.0  
ENGL 5908 [1.0] Research Essay (in the specialization)

**Total Credits** 4.5

#### Requirements - Thesis pathway (4.5 credits)

**1. 1.0 credit in:** 1.0  
CLIM 5000 [1.0] Climate Collaboration

**2. 0.0 credit in:**  
CLIM 5800 [0.0] Climate Seminar Series

**3. 1.0 credit in** ENGL at the 5000-level (excluding ENGL 5909) 1.0

**4. 0.5 credit in:** 0.5  
ENGL 5005 [0.5] M.A. Seminar

**5. 2.0 credits in:** 2.0  
ENGL 5909 [2.0] M.A. Thesis (in the specialization)

**Total Credits** 4.5

### M.A. English with Collaborative Specialization in Digital Humanities (4.5 credits)

#### Requirements - Coursework pathway (4.5 credits)

**1. 2.5 credits in** 5000-level ENGL (excluding ENGL 5908 and ENGL 5909) 2.5

**2. 0.5 credit in:** 0.5  
ENGL 5005 [0.5] M.A. Seminar

**3. 0.5 credit in:** 0.5  
DIGH 5000 [0.5] Issues in the Digital Humanities

**3. 1.0 credit in** DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course) 1.0

**4. 0.0 credit in:** 0.0  
DIGH 5800 [0.0] Digital Humanities: Professional Development

**Total Credits** 4.5

#### Requirements - Research essay pathway (4.5 credits)

**1. 2.0 credits in** ENGL at the 5000 level (excluding ENGL 5909) 2.0

**2. 0.5 credit in:** 0.5  
ENGL 5005 [0.5] M.A. Seminar

**3. 1.0 credit in:** 1.0  
ENGL 5908 [1.0] Research Essay (in the specialization)

**4. 0.5 credit in:** 0.5

DIGH 5000 [0.5] Issues in the Digital Humanities

**5. 0.5 credit in** Digital Humanities (DIGH 5011, DIGH 5012, or annually listed Digital Humanities course) 0.5

**6. 0.0 credit in:** 0.0  
DIGH 5800 [0.0] Digital Humanities: Professional Development

**Total Credits** 4.5

#### Requirements - Thesis pathway (4.5 credits)

**1. 1.0 credit in** ENGL at the 5000 level (excluding ENGL 5908) 1.0

**2. 0.5 credit in:** 0.5  
ENGL 5005 [0.5] M.A. Seminar

**3. 2.0 credits in:** 2.0  
ENGL 5909 [2.0] M.A. Thesis (in the specialization)

**4. 0.5 credit in:** 0.5  
DIGH 5000 [0.5] Issues in the Digital Humanities

**5. 0.5 credit from:** 0.5  
DIGH 5011 [0.5] Graduate Practicum in Digital Humanities  
DIGH 5012 [0.5] Directed Readings and Research in Digital Humanities

- or annually listed DIGH course

**6. 0.0 credit in:** 0.0  
DIGH 5800 [0.0] Digital Humanities: Professional Development

**Total Credits** 4.5

### Ph.D. English (5.0 credits)

#### Requirements:

**1. 1.0 credit in:** 1.0  
ENGL 6003 [0.5] Theories and Foundations in the Production of Literature

ENGL 6004 [0.5] Approaches to the Production of Literature

**2. 0.5 credit in:** 0.5  
ENGL 6002 [0.5] Proseminar

**3. 2.0 credits in** approved courses 2.0

**4. 1.0 credit in:** 1.0  
ENGL 6900 [1.0] Comprehensive Examination

**5. 0.5 credit in:** 0.5  
ENGL 6902 [0.5] Dissertation Proposal

#### 6. Language requirement:

Satisfactory demonstration of an understanding of a language other than English. Contact the Department for details.

**7. 0.0 credit in:** 0.0  
ENGL 6909 [0.0] Thesis

**Total Credits** 5.0

### Ph.D. English with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements:

**1. 0.5 credit in:** 0.5  
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

**2. 0.0 credit in:**

AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
ENGL 6003 [0.5]	Theories and Foundations in the Production of Literature	
ENGL 6004 [0.5]	Approaches to the Production of Literature	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
ENGL 6002 [0.5]	Proseminar	
<b>6. 1.0 credit in approved courses</b>		<b>1.0</b>
<b>7. 1.0 credit in:</b>		<b>1.0</b>
ENGL 6900 [1.0]	Comprehensive Examination	
<b>8. 0.5 credit in:</b>		<b>0.5</b>
ENGL 6902 [0.5]	Dissertation Proposal	
<b>9. Language requirement:</b>		
Satisfactory demonstration of an understanding of a language other than English. Contact the Department for details.		
<b>10. 0.0 credit in:</b>		
ENGL 6909 [0.0]	Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### Ph.D. English with Collaborative Specialization in African Studies (Advanced Completion - 4.5 credits)

Applicants to the Ph.D. English with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies may be considered for admission to an Advanced Completion Option of the Ph.D.

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
ENGL 6003 [0.5]	Theories and Foundations in the Production of Literature	
ENGL 6004 [0.5]	Approaches to the Production of Literature	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
ENGL 6002 [0.5]	Proseminar	
<b>4. 1.0 credit in approved courses</b>		<b>1.0</b>
<b>5. 1.0 credit in:</b>		<b>1.0</b>
ENGL 6900 [1.0]	Comprehensive Examination	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
ENGL 6902 [0.5]	Dissertation Proposal	
<b>7. Language requirement:</b>		
Satisfactory demonstration of an understanding of a language other than English. Contact the Department for details.		
<b>8. 0.0 credit in:</b>		
ENGL 6909 [0.0]	Thesis (in the specialization)	
<b>Total Credits</b>		<b>4.5</b>

## Regulations

See the General Regulations section of this Calendar.

A standing of B- or better must be obtained in each credit counted towards the master's degree.

Each program is designed to be completed within the three-term academic year. Each program is of equal status.

### Guidelines for Completion of Master's Degree

Full-time master's candidates are expected to complete all requirements in twelve months or three terms of registered full-time study. Part-time master's candidates are expected to complete their degree requirements within an elapsed period of three calendar years after the date of initial registration.

## Regulations

See the General Regulations section of this Calendar.

### Academic Standing

Doctoral students must normally obtain a grade of B- or better in each course counted toward the fulfilment of the degree requirements.

### Admission Requirements

The normal admission requirement for the master's program is a B.A. (Honours) (or the equivalent) in English language and literature, with at least a high Honours standing (normally B+ or better).

Possession of the normal entrance standing is not in itself, however, an assurance of admission into the program.

### Qualifying-Year Program

Applicants who hold a three-year non-honours B.A. degree with at least a high Honours standing (normally B+), with a major in English language and literature or a related discipline, may be admitted to the qualifying-year program. Normally, these students will be required to complete 4.0 or 5.0 credits in English, as determined by the department, and to maintain a high Honours standing (normally B+) before being considered for admission into the master's program. For more information regarding the qualifying year, see the General Regulations section of this Calendar.

### Accelerated Pathway

The accelerated pathway in the Department of English Language and Literature is a flexible and individualized plan of graduate study. Students in their final year of a Carleton B.A. Honours in English with demonstrated academic excellence and an aptitude for research may be invited to apply for this option.

### Accelerated Pathway Requirements

Students accepted into the Accelerated Pathway will be allowed to enroll in up to two 5000-level graduate seminars during their final year of study. These courses will count towards the requirements for up to 1.0 credits of 4000-level courses in their BA Honours degree. Students who obtain satisfactory standing as determined by the graduate committee in these 5000-level courses may receive advance standing with transfer credit of up to 1.0

credit, which can reduce their time to completion if they are subsequently accepted into a Carleton University Master's degree in English.

A special committee is responsible for inviting students to apply for entrance to this pathway. A minimal overall CGPA of 11.0 is normally required for consideration; invited students should submit two reference letters from English Department faculty members and a writing sample to both Undergraduate Supervisor and Graduate Supervisor of the English Department. If accepted into the accelerated pathway, students must consult with both the Undergraduate and Graduate Supervisors to determine which graduate seminars they will take.

### **Admission Requirements**

Applicants will normally hold a master's degree in English (or equivalent) with at least an A- average (10 G.P.A.)

Applicants judged to be deficient in preparation may be asked to complete course work in addition to the Ph.D. program requirements.

### **English (ENGL) Courses**

#### **ENGL 5002 [0.5 credit]**

##### **Studies in Theory I**

Selected topics in literary and cultural theory.

#### **ENGL 5004 [0.5 credit]**

##### **Studies in Transnational Literatures**

Topics in transnational, diaspora and postcolonial literatures and theory. Topics vary from year to year.

#### **ENGL 5005 [0.5 credit]**

##### **M.A. Seminar**

Examines topics such as research resources and methodologies, current issues in literary theory and professional concerns. Graded Satisfactory/Unsatisfactory.

#### **ENGL 5006 [0.5 credit]**

##### **Studies in Theory II**

Selected topics in literary and cultural theory.

#### **ENGL 5007 [0.5 credit]**

##### **Studies in Indigenous Literatures**

Selected texts of Indigenous literature and culture. Topics may vary from year to year.

#### **ENGL 5008 [0.5 credit]**

##### **Studies in African Literature**

Selected texts of African literature and culture. Topics may vary from year to year.

#### **ENGL 5009 [0.5 credit]**

##### **Studies in South Asian Literature**

Selected texts of South Asian literature and culture. Topics vary from year to year and may be organized by theme, author, or genre.

#### **ENGL 5010 [0.5 credit]**

##### **Studies in Caribbean Literature**

Topics in Caribbean literatures and theory. Topics vary from year to year.

#### **ENGL 5101 [0.5 credit]**

##### **Historical Linguistics: English**

A theory-intensive course that will study the development of English starting with Proto-Indo-European progressing through Common Germanic to the stages of English itself. Topics include phonological sound changes, phonemic inventories, and morphological and syntactic typology. Also listed as LING 5802.

Also offered at the undergraduate level, with different requirements, as LING 4802, for which additional credit is precluded.

#### **ENGL 5120 [0.5 credit]**

##### **Book Arts Workshop**

This course immerses graduate students in the practical arts and histories of book production. At least part of the course will take place in the Book Arts Lab in MacOdrum Library, where students will acquire skills in printing, bibliography, and/or bookmaking.

Includes: Experiential Learning Activity

#### **ENGL 5207 [0.5 credit]**

##### **Studies in Old English**

Topics in the early medieval period. Topics vary from year to year and may include Old English, Old Norse, Latin texts in translation, or pre-Chaucerian texts.

#### **ENGL 5208 [0.5 credit]**

##### **Studies in Middle English Literature**

Studies in the literature and culture of England between 1100 and 1550. Topics vary from year to year and may include texts in Middle English, French and/or Latin (French and Latin texts are usually studies in translations).

#### **ENGL 5303 [0.5 credit]**

##### **Studies in Early Modern Literature I**

A study of early modern authors, texts, and problems. Topics may vary from year to year.

#### **ENGL 5305 [0.5 credit]**

##### **Studies in Early Modern Literature II**

A study of early modern authors, texts, and problems. Topics will vary from year to year.

**ENGL 5402 [0.5 credit]****Studies in Eighteenth-Century Literature**

Selected texts of eighteenth-century literature and culture. Topics may vary from year to year.

**ENGL 5408 [0.5 credit]****Studies in Romanticism**

Selected texts of Romantic literature and culture. Topics vary from year to year and may be organised by theme, author or genre.

**ENGL 5501 [0.5 credit]****Studies in Nineteenth-Century Literature I**

Selected readings in nineteenth-century British literature and culture. Topics vary from year to year and may be organized by theme, author, and/or genre.

**ENGL 5503 [0.5 credit]****Studies in Nineteenth-Century Literature II**

Selected readings in nineteenth-century British literature and culture. Topics vary from year to year and may be organized by theme, author, and/or genre.

**ENGL 5606 [0.5 credit]****Studies in Twentieth-Century Literature**

Selected texts of twentieth-century literature and culture. Topics may vary from year to year.

**ENGL 5608 [0.5 credit]****Studies in Modernism**

Special topics in studies in modernism will vary from year to year.

**ENGL 5609 [0.5 credit]****Studies in American Literature I**

Selected texts of American literature and culture. Topics may vary from year to year.

**ENGL 5610 [0.5 credit]****Studies in Contemporary Literature I**

Selected texts of contemporary literature and culture. Topics may vary from year to year.

**ENGL 5611 [0.5 credit]****Studies in Contemporary Literature II**

Selected texts of contemporary literature and culture.

**ENGL 5708 [0.5 credit]****Studies in American Literature II**

Topic may vary from year to year.

**ENGL 5804 [0.5 credit]****Studies in Canadian Literature I**

Topics vary from year to year and may include issues of genre, selected themes, literary movements, or developments in theory.

**ENGL 5806 [0.5 credit]****Studies in Canadian Literature II**

Topics vary from year to year and may include issues of genre, selected themes, literary movements, or developments in theory.

**ENGL 5900 [0.5 credit]****Selected Topic in English Studies I**

Topic may vary from year to year.

**ENGL 5901 [0.5 credit]****Selected Topic in English Studies II**

Topic may vary from year to year.

**ENGL 5908 [1.0 credit]****Research Essay**

Includes: Experiential Learning Activity

**ENGL 5909 [2.0 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

**ENGL 6002 [0.5 credit]****Proseminar**

Exploration of recent critical theory and discussion of issues related to the profession. Graded SAT/UNSAT.

**ENGL 6003 [0.5 credit]****Theories and Foundations in the Production of Literature**

Survey of foundational theoretical texts from the fields of book history, manuscript and print cultural studies, media studies, and cultural theory.

**ENGL 6004 [0.5 credit]****Approaches to the Production of Literature**

With a focus on one or more approaches, this course studies how literary and cultural production are shaped by economic, historical, institutional, sociological, legal, and technological forces.

**ENGL 6101 [0.5 credit]****Directed Reading**

This tutorial is designed to permit students to pursue individual research. Topics will be chosen in consultation with at least one faculty member and the graduate supervisor.

**ENGL 6102 [0.5 credit]****Studies in the Production of Literature**

Explores selected studies/themes related to the production of literature.

**ENGL 6103 [0.5 credit]****Selected Topics in the Production of Literature**

Selected topics/themes related to the production of literature.

**ENGL 6900 [1.0 credit]****Comprehensive Examination**

This examination will include a range of texts in the student's field of specialization.

One four-hour written exam, and one week later, a one-to-two hour oral exam.

**ENGL 6902 [0.5 credit]****Dissertation Proposal**

The dissertation proposal is approved by the student's dissertation committee and defended at an oral examination. The dissertation proposal is completed after the comprehensive examination requirement has been satisfied. Graded SAT/UNS.

Includes: Experiential Learning Activity

**ENGL 6909 [0.0 credit]****Thesis**

Includes: Experiential Learning Activity

## Environmental Engineering

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This section presents the requirements for programs in:

- **M.A.Sc. Environmental Engineering**
- **M.Eng. Environmental Engineering**
- **M.A.Sc. Environmental Engineering with Collaborative Specialization in Climate Change**
- **M.Eng. Environmental Engineering with Collaborative Specialization in Climate Change**
- **Ph.D. Environmental Engineering**

**Program Requirements****M.A.Sc. Environmental Engineering (5.0 credits)**

Study at the master's level can be pursued through a thesis leading to a M.A.Sc., a project option leading to a M.Eng., or a coursework option leading to a M. Eng. The requirements for coursework are specified in terms of credits. At Carleton University, 1.0 credit typically comprises three hours of lectures or seminars a week for two terms, or the equivalent. At the University of Ottawa, 1.0 course credit is one hour of instruction per week for one term. Thus 1.0 credit in Carleton University notation is equivalent to 6 course credits in the University of Ottawa notation. The requirements are:

**Requirements - Thesis option:**

<b>1. 2.5 credits in</b> courses, with at least 0.5 credit from each of at least three of the areas of study listed below	<b>2.5</b>
<b>2. Participation in the graduate seminar series:</b>	<b>0.0</b>
ENVE 5800 [0.0]    Master's Seminar (participation in the graduate seminar series)	
<b>3. 2.5 credits in:</b>	<b>2.5</b>
ENVE 5909 [2.5]    Master's Thesis (including successful oral defence)	

**Note: no more than 0.5 credit may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301**

<b>Total Credits</b>	<b>5.0</b>
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**M.Eng. Environmental Engineering (5.0 credits)****Requirements - Project option (5.0 credits)**

<b>1. 4.0 credits in</b> courses	<b>4.0</b>
<b>2. 1.0 credit in:</b>	<b>1.0</b>
ENVE 5900 [1.0]    Environmental Engineering Project	
<b>3. Participation in the graduate student seminar series:</b>	<b>0.0</b>
ENVE 5800 [0.0]    Master's Seminar	

**Note: no more than 1.0 credit may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301**

<b>Total Credits</b>	<b>5.0</b>
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**Requirements - Coursework option (5.0 credits)**

<b>1. Completion of a minimum of 5.0 credits by course</b>	<b>5.0</b>
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**Note: no more than 1.5 credits may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301**

<b>Total Credits</b>	<b>5.0</b>
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**Breadth Requirement**

In keeping with the objective of ensuring a breadth of knowledge for graduates of the program, students in

the master's program are expected to take at least one graduate level course from each of at least three of the following areas of study:

- Air Pollution
- Water Resources Management, Groundwater Management and Contaminant Transport
- Management of Solid, Hazardous, and Radioactive Waste, and Pollution Prevention
- Water and Wastewater Treatment
- Environmental Impact Assessment, Sustainability and Climate Change

This requirement serves the objectives of educating graduate professionals who are not only specialized in one area but who are sufficiently familiar with problems and different approaches in the other areas to enable them to interact readily at a technical level with colleagues working in those areas. In addition to the courses associated with the individual areas, students will be encouraged to select courses from fundamental areas such as chemistry, numerical modelling, and applied statistics.

Master's candidates transferring from another university must take at least half their courses at the Institute.

### M.A.Sc. Environmental Engineering with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 1.5 credits in</b> courses, with at least 0.5 credit from two different areas of study listed below outside the area of EIA, Sustainability and Climate Change	1.5
<b>4. 0.0 credit in:</b>	
ENVE 5800 [0.0]      Master's Seminar (participation in the graduate student seminar series)	
<b>5. 2.5 credits in:</b>	2.5
ENVE 5909 [2.5]      Master's Thesis (in the specialization)	
<b>6. Note: no more than 0.5 credit may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301</b>	
<b>Total Credits</b>	<b>5.0</b>

### M.Eng. Environmental Engineering with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Project pathway

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 0.5 credit from:</b>	0.5
ENVE 5105 [0.5]      Atmospheric Aerosols	
ENVE 5200 [0.5]      Climate Change and Engineering	
ENVE 5201 [0.5]      Geo-Environmental Engineering	

ENVE 5205 [0.5]      Sludge Treatment and Disposal	
ENVJ 5908 [0.5]      Anaerobic Digestion	
ENVJ 5212 [0.5]      Climate Change Impacts on Water Resources	
or approved Special Topics in the area of climate change	
<b>4. 2.5 credits in</b> courses, with at least 0.5 credit from two different areas of study listed below outside the area of EIA, Sustainability and Climate Change	2.5
<b>5. 0.0 credit in:</b>	
ENVE 5800 [0.0]      Master's Seminar	
<b>6. 1.0 credit in:</b>	1.0
ENVE 5900 [1.0]      Environmental Engineering Project (in the specialization)	
<b>Note: no more than 1.0 credit may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301</b>	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0]      Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]      Climate Seminar Series	
<b>3. 1.5 credits from:</b>	1.5
ENVE 5105 [0.5]      Atmospheric Aerosols	
ENVE 5200 [0.5]      Climate Change and Engineering	
ENVE 5201 [0.5]      Geo-Environmental Engineering	
ENVE 5205 [0.5]      Sludge Treatment and Disposal	
ENVJ 5908 [0.5]      Anaerobic Digestion	
ENVJ 5212 [0.5]      Climate Change Impacts on Water Resources	
or approved Special Topics in the area of climate change	
<b>4. 2.5 credits in</b> courses, with at least 0.5 credit from two different areas of study listed below outside the area of EIA, Sustainability and Climate Change	2.5
<b>Note: no more than 1.5 credits may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301</b>	
<b>Total Credits</b>	<b>5.0</b>

### Ph.D. Environmental Engineering (2.0 credits)

#### Ph.D. Environmental Engineering (1.5 credits)

<b>1. 1.5 credits in</b> courses	1.5
<b>2. 0.5 credits in:</b>	0.5
ENVE 7800 [0.5]      Ph.D. Seminar	
<b>3. 0.0 credit in:</b> Successful completion of the comprehensive examination, which consists of the successful defence of a PhD Thesis Proposal	
ENVE 6902 [0.0]      Ph.D. Comprehensive Examination	
<b>4. 0.0 credits in:</b>	0.0
ENVE 6909 [0.0]      Ph.D. Thesis (Including successful oral defence)	
<b>Note: no more than 0.5 credit may be taken from the following: ENVE 5008, ENVE 5101, ENVE 5200, ENVE 5201, ENVE 5301</b>	
<b>Total Credits</b>	<b>2.0</b>

Ph.D. candidates transferring from another university must take at least half of their courses at the Institute.

## Graduate Courses

Course selection is subject to the approval of the adviser or the Advisory committee. Students may choose courses offered at either university from among those listed below.

The courses listed below are grouped by area of study. Master's students must complete at least one course in three of the five areas. The program's Associate Chair (graduate affairs), in consultation with the Institute's Director or Associate Director, will decide when a course offered outside the Institute or offered under a Special Topics or Directed Studies heading can be considered to meet the requirements of a given area. Course descriptions may be found in the departmental sections of the calendars concerned. Course codes in parentheses are for University of Ottawa (EVG, CVG and CHG), and those that begin with the prefix "ENVE" or "CIVE" are offered at Carleton. Only a selection of courses is given in a particular academic year.

Full course descriptions for courses offered at Carleton can be found in the relevant courses section of this calendar.

### Air Pollution

ENVE 5101 (EVG 7101)	Air Pollution Control
ENVE 5105 (EVG 7105)	Atmospheric Aerosols
ENVE 5106 (EVG 7106)	Atmospheric Chemical Transport Modelling
ENVJ 5105 (CHG 8132)	Adsorption Separation Process

### Water Resources Management, Groundwater Management, and Contaminant Transport

CIVJ 5502 (CVG 5112)	Numerical Modelling in Water Resources
CIVJ 5503 (CVG 5160)	Sediment Transport
CIVJ 5504 (CVG 5162)	River Hydraulics
CIVJ 5605 (CVG 5124)	Coastal Engineering
ENVE 5301 (EVG 7301)	Contaminant Hydrogeology
ENVE 5303 (EVG 7303)	Multiphase Flow in Soils
ENVJ 5182 (EVG 5182)	Water Resources Management
ENVJ 5183 (EVG 5183)	Mixing and Transport in Water Bodies
ENVJ 5301 (EVG 5301)	Soil and Water Conservation Engineering
ERTH 5403 (GEO 5143)	Environmental Isotopes and Groundwater Geochemistry
ERTH 5407 (GEO 5147)	Aqueous Inorganic Geochemistry and Modelling
ERTH 5503 (GEO 5153)	Computer Techniques in the Earth Sciences

## Management of Solid, Hazardous, and Radioactive Waste and Pollution Prevention

CIVJ 5109 (CVG 5314)	Geotechnical Hazards
ENVE 5201 (EVG 7201)	Geo-Environmental Engineering
ENVE 5204 (EVG 7134)	Resource Industry Waste Management
ENVE 5205 (EVG 7132)	Sludge Treatment and Disposal
ENVJ 5906 (EVG 5133)	Solid Waste Management
ENVJ 5908 (EVG 5179)	Anaerobic Digestion

### Water and Wastewater Treatment

ENVE 5004 (EVG 7144)	Advanced Wastewater Treatment
ENVE 5007 (EVG 7101)	Filtration and Membranes in Water Treatment
ENVE 5008	Wastewater Treatment Principles and Design
ENVJ 5001 (EVG 5001)	Biofilm Processes in Wastewater Treatment
ENVJ 5302 (EVG 5302)	Decentralized Wastewater Management
ENVJ 5502 (CHG 8192)	Membranes in Clean Processes
ENVJ 5900 (EVG 5130)	Wastewater Treatment Process Design
ENVJ 5901 (EVG 5132)	Unit Operations of Water Treatment
ENVJ 5902 (EVG 5138)	Advanced Water Treatment
ENVJ 5905 (EVG 5137)	Water and Wastewater Treatment Process Analysis
ENVJ 5907 (EVG 5134)	Chemistry for Environmental Engineering

### Environmental Impact Assessment, Sustainability and Climate Change

ENVE 5200 (EVG 7200)	Climate Change and Engineering
ENVE 5206 (EVG 7206)	Energy and Resource Recovery from Waste
ENVJ 5212 (EVG 5212)	Climate Change Impacts on Water Resources
ENVJ 5700 (CVG 5139)	Environmental Assessment of Civil Engineering Projects
ENVE 5107 (EVG 7107)	Radiative Transfer and Remote Sensing
ENVE 5207 (EVG 7207)	Energy and the Critical Zone

To fulfill the requirements beyond the 1.5 credits of area courses, students may choose from the following:

### Other Institute Courses

ENVJ 5333 (EVG 5333)	Research Methodology
ENVJ 5504 (CVG 8194)	Membrane Liquid Separation Processes and Materials

ENVJ 5505 (CHG 8195)	Advanced Numerical Methods in Chemical and Biological Engineering
ENVJ 5507 (CHG 8196)	Interfacial Phenomena in Engineering
GEOG 5804	Geographic Information Systems

#### **Seminars, Directed Studies and Special Topics**

ENVE 5701 (EVG 7001)	Topics in Environmental Engineering
ENVE 5702 (EVG 7002)	Topics in Environmental Engineering
ENVE 5704 (EVG 7004)	Topics in Environmental Engineering
ENVE 5703 (EVG 7003)	Topics in Environmental Engineering
ENVE 5705 (EVG 7005)	Topics in Environmental Engineering
ENVE 5800 (EVG 5800)	Master's Seminar
ENVE 5906 (EVG 6108)	Directed Studies 1
ENVE 6906 (EVG 6109)	Directed Studies 2
ENVE 7800 (EVG 5801)	Ph.D. Seminar
ENVJ 6300 (EVG 6300)	Special Topics in Environmental Engineering
ENVJ 6301 (EVG 6301)	Special Topics in Environmental Engineering
ENVJ 6302 (EVG 6302)	Special Topics in Environmental Engineering
ENVJ 6303 (EVG 6303)	Special Topics in Environmental Engineering
ENVJ 6304 (EVG 6304)	Special Topics in Environmental Engineering

Special Topics courses in Civil or Chemical Engineering will count as Institute courses only if approved by the program's Associate Chair (graduate affairs), in consultation with the Institute's Director or Associate Director.

#### **Projects and Theses**

ENVE 5900 (EVG 6001)	Environmental Engineering Project
ENVE 5909 (EVG 7999)	Master's Thesis
ENVE 6909 (EVG 9999)	Ph.D. Thesis
(EVG 9998) Comprehensive Examination	

#### **Non-Institute Courses**

Students may also, subject to approval, select courses from the graduate programs in Civil, Chemical and Mechanical Engineering, as well as in Biology, Chemistry, Earth Sciences, Computer Sciences, Geography and Public Policy and Administration at both universities. Courses taken outside the Institute will not count towards the degree requirements unless approved by the adviser or the advisory committee and the program's Associate Chair (graduate affairs). In all programs, at least one half of the course work must be taken from the Institute.

## **Regulations**

See the General Regulations section of this Calendar.

### **Regularly Scheduled Break**

For immigration purposes, the summer term (May to August) for the M.Eng. Environmental Engineering (coursework and project pathways) is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### **Admission**

The requirement for admission to the master's program in Environmental Engineering is a four-year bachelor's degree in Environmental Engineering, other related engineering disciplines (Civil, Chemical, Mechanical, etc.), or Environmental Science disciplines.

All students entering the program are required to have courses in mathematics, probability and statistics equivalent to courses required in undergraduate engineering programs. Students admitted without full equivalency in these areas are expected to take appropriate undergraduate courses early in their studies. These courses will be additional to the normal degree requirements.

For applicants to the M.A.Sc. program without a bachelor's degree in environmental, civil or chemical engineering, up to 3 undergraduate courses may be required in addition to the graduate program requirements. These may include a course in fluid mechanics, a course in environmental engineering fundamentals and a senior level undergraduate course in environmental engineering to be identified jointly by the supervisor, Associate Chair for Graduate Studies, and Director or Associate Director for OCIE NE in the department.

For applicants to the MEng program without a bachelor's degree in environmental, civil or chemical engineering, up to 3 undergraduate courses may be specified in addition to the graduate program requirements at admission by the Director or Associate Director for OCIE NE in the department. These will include a course in fluid mechanics, and course in chemical/biochemical kinetics and reactors if required.

### **Accelerated Pathway**

The accelerated pathway in Environmental Engineering is a flexible and individualized plan of graduate study. Students in the final year of Bachelor of Engineering in Civil, Environmental, or Architectural Conservation and Sustainability Engineering with demonstrated excellent aptitude for graduate studies and research may qualify for this option.

Students with a CGPA of 10.0 or higher, going into their final year of undergraduate study, and intending to apply to a Master's degree in Environmental Engineering in the following academic year should consult with both

the Undergraduate and Graduate Associate Chairs to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses.

Upon approval for the accelerated pathway, students will replace a maximum of 1.0 credit of their engineering electives with 5000 level ENVE courses. Students will receive advanced standing for the approved 5000 level courses in which they receive a grade of A- or higher.

### Admission

The normal requirement for admission into the Ph.D. Program in Environmental Engineering is completion of either a Master's degree in Environmental Engineering, or a Master's degree in an engineering discipline with an environmental specialization.

- Students wishing to enter the program who do not have either of these backgrounds will be evaluated on a case-by-case basis. Additional course requirements may be specified in some cases.
- Students who have been admitted to a master's program may be admitted into the Ph.D. program, without completing their master's program, if they demonstrate: (1) outstanding academic performance by completing at least 2.5 credits of course work that fulfil the breadth requirements as specified in the Master's degree requirements with a CGPA of A- or higher, and (2) significant promise for advanced research and the ability to defend their Ph.D. proposal [in the first year of their Ph.D. program.](#)

### Environmental Engineering - Joint (ENVJ) Courses

#### ENVJ 5001 [0.5 credit] (EVG 5001) Biofilm Processes in Wastewater Treatment

#### ENVJ 5105 [0.5 credit] (CHG 8132) Adsorption Separation Process

Microporous materials and molecular sieves as adsorbents. Adsorption equilibrium and adsorption kinetics. Equilibrium adsorption of single fluids and mixtures. Diffusion in porous media and rate processes in adsorbents. Adsorber dynamics: bed profiles and breakthrough curves. Cyclic fluid separation processes. Pressure swing adsorption.

#### ENVJ 5182 [0.5 credit] (EVG 5182) Water Resources Management

Global water supply and demand, integrated water resources management, modelling and optimization of water resources systems, reservoir management, uncertainty modelling, climate change and water, decision under uncertainty.  
Also listed as CIVJ 5182.

#### ENVJ 5183 [0.5 credit] (EVG 5183) Mixing and Transport in Water Bodies

Water resources systems models: rivers, lakes, estuaries; water quality parameters, conservative and non-conservative parameters, laminar and turbulent flows, dispersion, pollution sources; modelling: simplified, dilution, three-dimensional; advection-diffusion equation, analytical solution, numerical solution, non-conservative transport and multi-component systems.

#### ENVJ 5212 [0.5 credit] (EVG 5212)

##### Climate Change Impacts on Water Resources

Spatiotemporal distribution of water and its impact on human activities, including domestic and municipal consumption, hydropower generation, rain-fed and irrigated agriculture, design and operation of sewer systems, floodplain zoning, navigation, etc. Critical assessment of methodologies for climate change impacts estimation.

Also listed as CIVJ 5212.

Prerequisite(s): Theoretical knowledge and hands-on application experience needed to perform climate change analysis on a water resources system.

#### ENVJ 5301 [0.5 credit] (EVG 5301)

##### Soil and Water Conservation Engineering

Design, water quality and climate change impacts of soil and water conservation systems. Topics include: urban storm water management (including LID) erosion control practices, subsurface and surface drainage systems and irrigation technologies.

#### ENVJ 5302 [0.5 credit] (EVG 5302)

##### Decentralized Wastewater Management

Fundamental principles and practical design applications of decentralized wastewater treatment for domestic and industrial sources. Management of decentralized wastewater systems, pre-treatment systems, soil infiltration systems, advanced onsite technologies, constructed wetlands, alternative collection systems, wastewater reuse and septage management.  
Also listed as CIVJ 5181.

#### ENVJ 5333 [0.5 credit] (EVG 5333)

##### Research Methodology

Key components and strategies required to build a robust scientific research program in environmental engineering including research questions, literature review, experiment design, data interpretation, scientific manuscripts, public speaking, ethics, and plagiarism.  
Also listed as CIVJ 5333.

**ENVJ 5502 [0.5 credit] (CHG 8192)****Membranes in Clean Processes**

Membrane separations as clean and cleaning technologies. Reverse osmosis, ultrafiltration, vapour permeation and pervaporation to the treatment of industrial process and waste streams. Nanostructured membrane materials. Membrane fouling models, foulant-membrane material interactions, solvent resistant membranes, aqueous and non-aqueous separations.

**ENVJ 5504 [0.5 credit] (CHG 8194)****Membrane Liquid Separation Processes and Materials****ENVJ 5505 [0.5 credit] (CHG 8195)****Advanced Numerical Methods in Chemical and Biological Engineering**

Includes: Experiential Learning Activity

**ENVJ 5507 [0.5 credit] (CHG 8196)****Interfacial Phenomena in Engineering****ENVJ 5700 [0.5 credit] (EVG 5139)****Environmental Assessment of Civil Engineering Projects**

Procedures and methods for systematic evaluation of the environmental impact of civil engineering projects including wastewater disposal systems, solid waste disposal systems, and water resource development systems.

**ENVJ 5900 [0.5 credit] (EVG 5130)****Wastewater Treatment Process Design**

The physical, chemical and biological processes involved in the treatment of domestic and industrial wastes. Waste characteristics, stream assimilation, biological oxidation, aeration, sedimentation, anaerobic digestion, sludge disposal.

**ENVJ 5901 [0.5 credit] (EVG 5132)****Unit Operations of Water Treatment**

Unit operations and unit processes involved in the treatment of a water supply for various uses. Topics included are water quality, water microbiology, sedimentation, chemical treatment, disinfection, water chemistry, flocculation.

**ENVJ 5902 [0.5 credit] (EVG 5138)****Advanced Water Treatment**

Scope, limitations and design procedures for water treatment processes for removal of toxic and non-standard contaminants. Water treatment problems and regulations, activated carbon treatment, ion exchange, disinfection practices and oxidation via advanced oxidation processes, iron and manganese removal, recent developments in coagulation, membranes, air stripping.

**ENVJ 5905 [0.5 credit] (EVG 5137)****Water and Wastewater Treatment Process Analysis**

Mass balancing in complex systems. Reaction kinetics and kinetic data analysis: classical and computer based methods. Reactor design: ideal reactors and real reactors. Analysis of tracer tests. Interfacial mass transfer: common theories. Mass transfer models.

**ENVJ 5906 [0.5 credit] (EVG 5133)****Solid Waste Management**

Collection and disposal of solid wastes. Sanitary landfill, composting, incineration and other methods of disposal. Material and energy recovery.

**ENVJ 5907 [0.5 credit] (EVG 5134)****Chemistry for Environmental Engineering**

Dilute aqueous solution chemistry of water and wastewater treatment. Chemical kinetics and equilibrium. Carbonate, phosphate and chlorine chemistry. Precipitation and complex formation. Corrosion. Analytical techniques and applications.

**ENVJ 5908 [0.5 credit] (EVG 5179)****Anaerobic Digestion**

Design and application of anaerobic processes used for treatment of municipal and industrial wastewaters. Microbiology and biochemistry fundamentals, techniques for monitoring anaerobic digestion performance, municipal sludge stabilization, anaerobic composting, anoxic/anaerobic bioremediation, Andrew's dynamic model. Design of two-phase digestion; DSFF reactors; UASB; UBF, ASB reactors.

**ENVJ 6300 [0.5 credit] (EVG 6300)****Special Topics in Environmental Engineering****ENVJ 6301 [0.5 credit] (EVG 6301)****Special Topics in Environmental Engineering****ENVJ 6302 [0.5 credit] (EVG 6302)****Special Topics in Environmental Engineering**

**ENVJ 6303 [0.5 credit] (EVG 6303)**  
**Special Topics in Environmental Engineering**

**ENVJ 6304 [0.5 credit] (EVG 6304)**  
**Special Topics in Environmental Engineering**

**ENVJ 8191 [0.5 credit] (CHG 8191)**  
**Selected Topics in Chemical Engineering**

## **Environmental Engineering (ENVE) Courses**

### **ENVE 5004 [0.5 credit] (EVG 7144)**

#### **Advanced Wastewater Treatment**

Fundamentals, applications, and design of biological, physical, and chemical treatment processes employed for advanced treatment of domestic and industrial wastewater. Reuse applications and guidelines.

### **ENVE 5007 [0.5 credit] (EVG 7101)**

#### **Filtration and Membranes in Water Treatment**

Filtration is a key process for removal of contaminants from water sources. This course discusses various filtration processes including slow sand filtration, conventional filtration, biological filtration, and low and high pressure membrane applications in a lecture and seminar format. Previous water related course knowledge expected.

### **ENVE 5008 [0.5 credit]**

#### **Wastewater Treatment Principles and Design**

Theoretical aspects of unit operations and processes for wastewater treatment with design applications. Topics include wastewater characteristics, flow rates, primary treatment, chemical unit processes, biological treatment processes, advanced wastewater treatment, disinfection, biosolids treatment and disposal. Laboratory procedures: activated sludge, anaerobic growth, chemical precipitation, disinfection.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as ENVE 4005, for which additional credit is precluded.

### **ENVE 5101 [0.5 credit] (EVG 7101)**

#### **Air Pollution Control**

Air quality and pollution; definitions, measurement and monitoring methods. Criteria pollutants, air toxics, particulate matter, secondary pollutants. Pollutant formation mechanisms. Major sources and control methods. Meteorology and principles of dispersion modeling. Principles of receptor modeling. Indoor air quality.

Also offered at the undergraduate level, with different requirements, as ENVE 4003, for which additional credit is precluded.

### **ENVE 5105 [0.5 credit] (EVG 7105)**

#### **Atmospheric Aerosols**

Atmospheric aerosol characterization and size distribution, theoretical fundamentals of physical and chemical processes that govern formation and transformation of aerosols in the atmosphere such as nucleation, coagulation, condensation/evaporation, and aerosol thermodynamics; interactions between aerosols and climate, aerosol sampling and measurement.

### **ENVE 5106 [0.5 credit] (EVG 7106)**

#### **Atmospheric Chemical Transport Modelling**

Fundamentals of Eulerian atmospheric modelling; overview of global and regional atmospheric models, basic principles of numerical methods used in air quality models; applications of air quality models; uncertainty and sensitivity analysis in air quality modelling.

### **ENVE 5107 [0.5 credit] (EVG 7107)**

#### **Radiative Transfer and Remote Sensing**

Exploration of interactions between light, Earth's surface, and the atmosphere. Topics include the radiative transfer equation, scattering and phase functions, and inverse theory. Applications to atmospheric science, climate, hydrology, and land use.

### **ENVE 5200 [0.5 credit] (EVG 7200)**

#### **Climate Change and Engineering**

Survey of the physical science of climate change, impacts on the built environment, and climate adaptation in engineering. Greenhouse gases, global warming, paleoclimatology, and Earth system responses. Climate change impacts on structural, water, transportation, and energy systems. Climate vulnerability assessment, examples of design adaptation.

Also offered at the undergraduate level, with different requirements, as ENVE 4200, for which additional credit is precluded.

### **ENVE 5201 [0.5 credit] (EVG 7201)**

#### **Geo-Environmental Engineering**

Landfill design; hydrogeologic principles, water budget, landfill liners, geosynthetics, landfill covers, quality control and quality assurance, clay/leachate interaction, composite liner design and leachate collection systems. Landfill operation, maintenance and monitoring. Design of environmental control and containment systems; slurry walls, grout curtains, Case studies.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as ENVE 4002, for which additional credit is precluded.

**ENVE 5204 [0.5 credit] (EVG 7134)****Resource Industry Waste Management**

Application of geotechnique and hydraulics to management of resource extraction residuals such as tailings, waste rock, and sludge from hard rock mines and bitumen extraction operations. Geotechnique of conventional and high density tailings disposal. Pipeline transport of concentrated suspensions. Closure technologies for mine waste impoundments.

**ENVE 5205 [0.5 credit] (EVG 7132)****Sludge Treatment and Disposal**

Aspects of sludge treatment, management, and disposal; sludge generation and characterization, thickening, preliminary treatment processes, aerobic and anaerobic digestion, lime stabilization, conditioning, dewatering, composting, land application and other disposal options, and thermal processes.

**ENVE 5206 [0.5 credit] (EVG 7206)****Energy and Resource Recovery from Waste**

Principles, design and application of biochemical and thermal processes for recovery of energy and value-added materials from different solid wastes and wastewater. Biochemical processes; biotransformation pathways, reactor analysis and chemical kinetics. Thermal treatment systems; process design, thermodynamics of material recovery.

**ENVE 5207 [0.5 credit] (EVG 7207)****Energy and the Critical Zone**

Survey of environmental impacts of energy development including groundwater and soil contamination and greenhouse gas emissions. Application of relevant theory (multiphase flow, mass transfer, fate and transport) to describe key environmental processes, detection, monitoring, and mitigation. Previous contaminant hydrogeology related course knowledge expected. Includes: Experiential Learning Activity

**ENVE 5301 [0.5 credit] (EVG 7301)****Contaminant Hydrogeology**

Theory of flow through porous media; soil characterization, soil properties, anisotropy, heterogeneity. Contaminant transport. Well hydraulics and pump tests. Introduction to numerical modeling; finite difference, finite elements, conceptual model, boundary conditions. Site remediation and remediation technologies. Also offered at the undergraduate level, with different requirements, as ENVE 4006, for which additional credit is precluded.

**ENVE 5303 [0.5 credit] (EVG 7303)****Multiphase Flow in Soils**

Theory of unsaturated flow and multiphase flow; capillary pressure-saturation relationships, relative permeability relationships, wettability, hysteresis, fluid entrapment, residual saturations, governing equations for flow and transport. Richard's Equation for unsaturated flow. Modeling of multiphase flow.

**ENVE 5305 [0.5 credit]****Stormwater Management and Low Impact Development**

The low impact development (LID) design approach is examined as a tool for sustainable urban planning and stormwater management. The course covers conventional (wet ponds), vegetated (green roofs, bioretention), infiltration (permeable pavements, exfiltration cells) and treatment (oil-grit separators) stormwater systems. Modelling approaches are introduced.

**ENVE 5701 [0.5 credit] (EVG 7001)****Topics in Environmental Engineering**

Courses in special topics in environmental engineering not covered by other graduate courses.

**ENVE 5702 [0.5 credit] (EVG 7002)****Topics in Environmental Engineering**

Courses in special topics in environmental engineering not covered by other graduate courses.

**ENVE 5703 [0.5 credit] (EVG 7003)****Topics in Environmental Engineering**

Courses in special topics in environmental engineering not covered by other graduate courses.

**ENVE 5704 [0.5 credit] (EVG 7004)****Topics in Environmental Engineering**

Courses in special topics in environmental engineering not covered by other graduate courses.

**ENVE 5705 [0.5 credit] (EVG 7005)****Topics in Environmental Engineering**

Courses in special topics in environmental engineering not covered by other graduate courses.

**ENVE 5800 [0.0 credit] (EVG 5800)****Master's Seminar**

M.A.Sc. and M.Eng (project option) students in the Environmental Engineering program are required to participate in these seminar series by attending all seminars and making at least one presentation during their graduate studies. Registration in the course should be in the term that the presentation will take place.

**ENVE 5900 [1.0 credit] (EVG 6001)**  
**Environmental Engineering Project**

Students enrolled in the M.Eng. program by project will conduct an engineering study, analysis, or design project under the general supervision of a member of the Department.

Includes: Experiential Learning Activity

**ENVE 5906 [0.5 credit] (EVG 6108)**  
**Directed Studies 1**

Precludes additional credit for CIVE 5906.

Prerequisite(s): open only to students in an Environmental Engineering Master's program.

**ENVE 5909 [2.5 credits] (EVG 7999)**  
**Master's Thesis**

Includes: Experiential Learning Activity

**ENVE 6902 [0.0 credit]**

**Ph.D. Comprehensive Examination**

Graduate students at the Doctoral level in the Environmental Engineering program are required to successfully complete a comprehensive examination which consists of a Ph.D. thesis proposal and successful defence of the proposal. Students should register in term they will defend their proposal.

Prerequisite(s): ENVE 6909 (taken concurrently).

**ENVE 6906 [0.5 credit] (EVG 6109)**  
**Directed Studies 2**

Precludes additional credit for CIVE 6906.

Prerequisite(s): open only to students in the Environmental Engineering Ph.D. program.

**ENVE 6909 [0.0 credit] (EVG 9999)**  
**Ph.D. Thesis**

Includes: Experiential Learning Activity

**ENVE 7800 [0.5 credit] (EVG 5801)**  
**Ph.D. Seminar**

Ph.D. students in the Environmental Engineering program are required to participate in these seminar series by attending all seminars and making at least one presentation during their graduate studies.

Registration in the course should be in the term that the presentation will take place.

## Ethics and Public Affairs

This section presents the requirements for programs in:

- **Ph.D. Ethics and Public Affairs**
- **Graduate Diploma in Ethics and Public Affairs**

### Program Requirements

#### Ph.D. Ethics and Public Affairs (5.0 credits)

##### Ph.D. Ethics and Public Affairs (10.0 credits)

**1. 3.0 credits in:** 3.0

EPAF 5500 [0.5]	Practicum
EPAF 6000 [0.5]	Ethical Concerns in Public Affairs
EPAF 6100 [1.0]	Public Reason I
EPAF 6200 [1.0]	Public Reason II

2. Proficiency in a social science research methodology, as evidenced by successful completion of an approved graduate-level methods course (0.5 credit) either at Carleton University or another university. (May be satisfied on or after admission).

**3. 1.0 credit in:** 1.0

EPAF 6600 [0.5]	Theory Examination
EPAF 6700 [0.5]	Area Examination

**4. 1.0 credit in** approved electives at the graduate level 1.0  
(which may include a methods course)

5. Public defence of a written dissertation proposal, preceded by its formal acceptance by the supervisory committee

6. Submission and successful defence of a thesis proposal

**7. 0.0 credits in:** 0.0

EPAF 6909 [0.0]	Ph.D. Thesis
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8. Public defence of the dissertation

9. Presentation of research findings to a professional audience

**Total Credits** 5.0

#### Graduate Diploma in Ethics and Public Affairs (3.0 credits)

##### Requirements:

**1. 2.0 credits in:** 2.0

EPAF 6100 [1.0]	Public Reason I
EPAF 6200 [1.0]	Public Reason II

**2. 1.0 credit in** electives from: 1.0

EPAF 5000 [0.5]	Topics in Ethics and Public Affairs
EPAF 5100 [0.5]	Supervised Research Tutorial
EPAF 5200 [0.5]	Ethics in Organizations
EPAF 5300 [0.5]	Values-based Deliberation
EPAF 5500 [0.5]	Practicum

- or another course approved by the Program Director.

**Total Credits** 3.0

### Regulations

See the General Regulations section of this Calendar.

### Admission

The typical requirement for admission to the Graduate Diploma in Public Affairs is an average of A- or above in honours or graduate courses, with evidence of proficiency in both (a) analytical ethics or political philosophy, and (b)

social science or interdisciplinary studies including social science.

### **Admission**

Admission to the Ph.D. Ethics and Public Affairs requires one of:

- A master's degree in a relevant field and an A average in relevant honours or graduate courses both in (a) analytical ethics or political philosophy and in (b) social science or interdisciplinary studies; or
- A master's degree in a relevant field, and successful performance in an EPAF graduate diploma program with an A average.

### **Ethics and Public Affairs (EPAF) Courses**

#### **EPAF 5000 [0.5 credit]**

##### **Topics in Ethics and Public Affairs**

Students prepare for and attend a series of guest lectures, submitting in writing a critical analysis of some aspect of the presentation or discussion for each lecture they attend.

#### **EPAF 5100 [0.5 credit]**

##### **Supervised Research Tutorial**

On a particular public issue, students identify ethical concerns and a range of evidence-based and values-based arguments for alternative policy options, assessing the comparative strength of those arguments.

Includes: Experiential Learning Activity

Prerequisite(s): EPAF 6100.

#### **EPAF 5200 [0.5 credit]**

##### **Ethics in Organizations**

A seminar on proactive approaches to ethical issues in organizations including design and implementation of ethics programs based on research in ethics and social science.

#### **EPAF 5300 [0.5 credit]**

##### **Values-based Deliberation**

A seminar exploring examples of civic and government dialogues on public issues, in light of theoretical foundations of deliberative dialogue.

#### **EPAF 5500 [0.5 credit]**

##### **Practicum**

Students gain experience doing ethics-related work in government, business, civil society, or consulting. Students report on their work as required, and their performance is graded satisfactory or unsatisfactory. Includes: Experiential Learning Activity

#### **EPAF 5800 [0.0 credit]**

##### **Workshop**

This workshop provides opportunities for gaining practical knowledge about academic and professional work in ethics and public affairs, through sharing experience among new students, advanced students, faculty, and guest speakers. Continued registration in each year of the EPAF programs is recommended but not required.

Prerequisite(s): Enrollment in Ethics and Public Affairs programs.

#### **EPAF 6000 [0.5 credit]**

##### **Ethical Concerns in Public Affairs**

A tutorial in which students identify the range of ethical concerns raised by a particular public issue chosen by the student.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the Ph.D. Ethics and Public Affairs program.

#### **EPAF 6100 [1.0 credit]**

##### **Public Reason I**

A seminar on the nature and limits of public reason, with application to a particular public issue chosen by the instructors. Normative concepts and theories of ethics and political philosophy will be studied as relevant to that issue.

#### **EPAF 6200 [1.0 credit]**

##### **Public Reason II**

A seminar continuing from Public Reason I, with application to a different public issue, which makes relevant a different set of normative concepts and theories of ethics and political philosophy.

Prerequisite(s): EPAF 6100.

#### **EPAF 6600 [0.5 credit]**

##### **Theory Examination**

Ph.D. comprehensive examination on main works and approaches in ethics and political philosophy.

#### **EPAF 6700 [0.5 credit]**

##### **Area Examination**

Ph.D. comprehensive examination on main works and approaches concerning the public issue on which the student wishes to conduct dissertation research, including relevant social science, ethics, and political philosophy.

#### **EPAF 6909 [0.0 credit]**

##### **Ph.D. Thesis**

Includes: Experiential Learning Activity

## European, Russian and Eurasian Studies

This section presents the requirements for programs in:

- **M.A. European, Russian and Eurasian Studies**
- **Graduate Diploma in European, Russian and Eurasian Studies**

### M.A. European, Russian and Eurasian Studies (5.0 credits)

#### Requirements - Research Essay pathway:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
EURR 5001 [0.5]	Interdisciplinary Seminar in European, Russian and Eurasian Studies	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
EURR 5010 [0.5]	Research Design and Methodology in European, Russian and Eurasian Studies	
<b>3. 1.0 credit in</b>	course work in the selected concentration (Russian and Eurasian Studies or European and European Union Studies)	<b>1.0</b>
<b>4. 2.0 credits in</b>	course work chosen with the approval of the graduate supervisor from the electives course list below	<b>2.0</b>
<b>5. 1.0 credit in:</b>		<b>1.0</b>
EURR 5908 [1.0]	Research Essay (related to the concentration, incorporating the approaches of at least two disciplines represented in the program; the research essay will be combined with an additional 1.0 credit coursework chosen with the approval of the graduate supervisor from the electives course list below)	

#### 6. Language requirement (see Language Requirement, below)

**Total Credits** **5.0**

#### Requirements - Thesis pathway:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
EURR 5001 [0.5]	Interdisciplinary Seminar in European, Russian and Eurasian Studies	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
EURR 5010 [0.5]	Research Design and Methodology in European, Russian and Eurasian Studies	
<b>3. 1.0 credit in</b>	course work in the selected concentration (Russian and Eurasian Studies or European and European Union Studies)	<b>1.0</b>
<b>4. 1.0 credit in</b>	course work chosen with the approval of the graduate supervisor from the electives course list below	<b>1.0</b>
<b>5. 2.0 credits in:</b>		<b>2.0</b>

EURR 5909 [2.0] M.A. Thesis (on a topic related to the concentration, which must combine interdisciplinary approaches with a greater degree of originality and a greater use of primary sources than that required of the research essay. The thesis must be defended orally. The thesis option cannot be taken without the specific permission of the graduate supervisor)

#### 6. Language requirement (see Language Requirement, below)

**Total Credits** **5.0**

#### Notes:

1. No more than 1.0 credit may be taken at the 4000 level.
2. No more than 0.5 credit in a language discipline may be counted towards program requirements.

#### Language Requirement

Each student must demonstrate language proficiency by the end of their degree. Students entering the M.A. program with no or minimal knowledge of a regional language will require extra coursework and/or summer language training to meet the language requirement.

For the Russian and Eurasian Studies concentration the student may select German, Polish, Russian, Ukrainian or Serbian/Croatian. For the European and European Union Studies concentration the student may select French, German, Italian, Polish or Spanish. A student may request permission to use another major language to fulfil this requirement. However, the requested language:

- (a) must be utilized in undertaking research for the research essay or M.A. thesis; and,
- (b) its selection must be approved by the graduate supervisor.

Meeting the language requirement may be demonstrated by successful completion of the appropriate language from the following list with a minimum grade of B+:

RUSS 4115 [0.5]	Russian for Social Studies
or	
GERM 3110 [1.0]	Intensive Third-Year German
or	
SPAN 3010 [0.5]	Third-Year Spanish I
& SPAN 3020 [0.5]	Third-Year Spanish II
or	
SPAN 3110 [1.0]	Intensive Third-Year Spanish
or	
ITAL 3110 [1.0]	Intensive Third-Year Italian
or	
FREN 1100 [1.0]	French 3

Students may also complete a written translation examination administered by the Institute. Students who have completed an undergraduate degree in a relevant language may apply to the Institute for a waiver of the language requirement.

## Guidelines for Completion of Master's Degree

Students in the 5.0-credit program with sufficient proficiency in Russian, German or another approved language are expected to complete the degree within three to four terms of study. Students participating in international exchanges or co-operative education programs will normally require longer to complete degree requirements.

## Concentrations

While one of the program's goals is to provide students with an integrative approach to the entire region, the concentration assures that each student's individual program will retain a particular focus. Europe and Eurasia have become increasingly integrated in terms of theoretical and methodological approaches. However, the two sub-regions covered by the program have distinct histories and legacies along with differing intellectual traditions. Selection of a concentration assures that each student's program will have an adequate level of intellectual coherence. Students studying the post-communist countries of Central and Eastern Europe that are EU member states or candidates for membership may select either concentration, depending on the thematic focus of the student's work.

The Institute offers two concentrations that draw systematically from the program's range of courses and expertise. Students are required to pursue one of these concentrations:

- Russian and Eurasian Studies
- European and European Union (EU) Studies

## Russian and Eurasian Studies

This concentration involves an interdisciplinary focus on the communist legacy and challenges facing countries in transition, with a geographic scope covering eastern and southeastern Europe, Russia, Ukraine, Belarus, the Caucasus and post-Soviet Central Asia.

### Russian and Eurasian Studies Concentration Course Electives List

EURR 4002 [0.5]	Post-Soviet States and Societies
or EURR 5002 [0.5]	Post-Soviet States and Societies
EURR 4101 [0.5]	The Balkans in Transition – 1918 to 1989
EURR 4102 [0.5]	The Balkans since 1989
EURR 4103 [0.5]	The Great Russian Novel
EURR 4205 [0.5]	Politics of Identity in Europe and the Russian Area
EURR 4207 [0.5]	Politics of Central Eurasia
EURR 4208 [0.5]	Foreign Policies of Soviet Successor States
EURR 4209 [0.5]	Politics of the Caucasus and Caspian Basin
EURR 5008 [0.5]	Nationalism in Russia and Eurasia
EURR 5100 [0.5]	Nation-Building in Central and Eastern Europe
EURR 5101 [0.5]	Russian Domestic Politics
EURR 5102 [0.5]	The International Political Economy of Transition

EURR 5107 [0.5]	Russia's Regional and Global Ambitions
EURR 5202 [0.5]	Special Topics in Russian and Eurasian Studies
EURR 5204 [0.5]	Central Europe, Past and Present
EURR 5305 [0.5]	Imperial Russia and the Russian Revolution
EURR 5306 [0.5]	The Soviet Union: Power and Culture
PSCI 4501 [0.5]	Politics of Identity in Europe and the Russian Area
PSCI 4503 [0.5]	Politics of Central Eurasia
PSCI 4505 [0.5]	Transitions to Democracy
PSCI 4601 [0.5]	Foreign Policies of Soviet Successor States
SOCI 5804 [0.5]	Modern Marxist Theory

## European and European Union Studies

This concentration focuses on countries involved in the European Union and on European integration processes, consequences, and dynamics from an interdisciplinary perspective, including EU enlargement and relations of the EU with other states.

### European and European Union Studies Concentration Course Electives List

EURR 4101 [0.5]	The Balkans in Transition – 1918 to 1989
EURR 4102 [0.5]	The Balkans since 1989
EURR 5008 [0.5]	Nationalism in Russia and Eurasia
EURR 5100 [0.5]	Nation-Building in Central and Eastern Europe
EURR 5102 [0.5]	The International Political Economy of Transition
EURR 5104 [0.5]	European Integration and European Security
EURR 5105 [0.5]	European Economic Integration
EURR 5106 [0.5]	Selected Topics in European Integration Studies
EURR 5108 [0.5]	Canada-EU Relations: Summer Module
EURR 5109 [0.5]	The EU in International Affairs
EURR 5201 [0.5]	Special Topics in European Studies
EURR 5204 [0.5]	Central Europe, Past and Present
EURR 5205 [0.5]	The European Union and its Eastern Neighbours
EURR 5302 [0.5]	EU Summer Study Abroad
EURR 5303 [0.5]	Contemporary Europe: From Postwar to the European Union
EURR 5304 [0.5]	Europe and International Migration
HIST 5210 [0.5]	Power
HIST 5211 [0.5]	Consumption
HIST 5212 [0.5]	European History Special Topics
INAF 5805 [0.5]	The EU in International Affairs
PSCI 4501 [0.5]	Politics of Identity in Europe and the Russian Area
PSCI 4505 [0.5]	Transitions to Democracy

### Electives Course List

<b>Economics</b>	
ECON 5603 [0.5]	Topics in International Economics

<b>History</b>	
HIST 4600 [1.0]	Seminar in Russian History
HIST 5210 [0.5]	Power
HIST 5211 [0.5]	Consumption
HIST 5212 [0.5]	European History Special Topics
<b>International Affairs</b>	
INAF 5202 [0.5]	Contemporary International Security
INAF 5206 [0.5]	Civil-Military Relations
INAF 5602 [0.5]	Development Assistance: Theory and Practice
INAF 5805 [0.5]	The EU in International Affairs
<b>Political Science</b>	
PSCI 4501 [0.5]	Politics of Identity in Europe and the Russian Area
PSCI 4503 [0.5]	Politics of Central Eurasia
PSCI 4504 [0.5]	Politics of the Caucasus and Caspian Basin
PSCI 4505 [0.5]	Transitions to Democracy
PSCI 4601 [0.5]	Foreign Policies of Soviet Successor States
PSCI 5201 [0.5]	Politics in Plural Societies
PSCI 5506 [0.5]	Gender and Politics
PSCI 5803 [0.5]	NATO and World Order
PSCI 5806 [0.5]	Strategic Thought and Issues in International Security
<b>Russian</b>	
RUSS 4115 [0.5]	Russian for Social Studies
<b>Sociology</b>	
SOCI 5804 [0.5]	Modern Marxist Theory
<b>European, Russian and Eurasian Studies</b>	
EURR 4101 [0.5]	The Balkans in Transition – 1918 to 1989
EURR 4102 [0.5]	The Balkans since 1989
EURR 4103 [0.5]	The Great Russian Novel
EURR 4205 [0.5]	Politics of Identity in Europe and the Russian Area
EURR 4207 [0.5]	Politics of Central Eurasia
EURR 4208 [0.5]	Foreign Policies of Soviet Successor States
EURR 4209 [0.5]	Politics of the Caucasus and Caspian Basin
EURR 5001 [0.5]	Interdisciplinary Seminar in European, Russian and Eurasian Studies
EURR 5002 [0.5]	Post-Soviet States and Societies
EURR 5008 [0.5]	Nationalism in Russia and Eurasia
EURR 5100 [0.5]	Nation-Building in Central and Eastern Europe
EURR 5101 [0.5]	Russian Domestic Politics
EURR 5102 [0.5]	The International Political Economy of Transition
EURR 5104 [0.5]	European Integration and European Security
EURR 5105 [0.5]	European Economic Integration
EURR 5106 [0.5]	Selected Topics in European Integration Studies
EURR 5107 [0.5]	Russia's Regional and Global Ambitions

EURR 5108 [0.5]	Canada-EU Relations: Summer Module
EURR 5201 [0.5]	Special Topics in European Studies
EURR 5202 [0.5]	Special Topics in Russian and Eurasian Studies
EURR 5204 [0.5]	Central Europe, Past and Present
EURR 5205 [0.5]	The European Union and its Eastern Neighbours
EURR 5301 [0.5]	Applied Policy Skills
EURR 5304 [0.5]	Europe and International Migration
EURR 5305 [0.5]	Imperial Russia and the Russian Revolution
EURR 5306 [0.5]	The Soviet Union: Power and Culture
EURR 5900 [0.5]	Tutorial in Russian and Eurasian Studies
EURR 5902 [0.5]	Tutorial in European and European Union Studies

Other 4000- and 5000-level courses may be approved by the graduate supervisor as EURUS credits if they are deemed appropriate to a particular student's objectives.

### Graduate Diploma in European, Russian and Eurasian Studies (2.0 credits)

#### Requirements (Type 2 Graduate Diploma):

1. 1.0 credit in EURR at the 5000 level	1.0
2. 1.0 credit in EURUS electives (see electives course list) or courses chosen with the approval of the graduate supervisor	1.0
<b>Total Credits</b>	<b>2.0</b>

#### Notes:

1. No credit in a language discipline may be counted towards program requirements.
2. To be awarded the Diploma Type 2, students must apply to graduate with the Diploma at the same time as they apply to graduate with their M.A. or Ph.D.

### Regulations

See the General Regulations section of this Calendar.

Master's candidates must obtain a grade of B- or higher on each credit counted towards the degree.

### Admission

For admission to the program, applicants should normally meet the following requirements:

- A four-year degree (or equivalent) in a humanities or social science discipline, with demonstrated coursework in the European/Russian/Eurasian area, ideally covering multiple disciplines (not solely language courses); and
- A reading knowledge of an appropriate major European/Eurasian language other than English (normally equivalent to two academic years of instruction, or one year with an intensive summer program). Applicants may be admitted with no proficiency or inadequate proficiency in an appropriate language; in this case they must be prepared to undertake additional language training during the

course of the MA program in addition to fulfilling the normal M.A. requirements.

Practical experience in the area of study will also be taken into consideration.

Applicants who do not have the required interdisciplinary background in the European/Russian/Eurasian area are encouraged to apply to the program, but additional coursework beyond the 5.0 credits may be required.

### **Accelerated Pathway**

The accelerated pathway in the Institute for European, Russian and Eurasian Studies is a flexible and individualized plan of graduate study for students in their final year of a Carleton undergraduate degree.

Students in their third-year of study in a Carleton undergraduate degree should consult with both the Undergraduate Advisor in their program of study and the Graduate Advisor in EURUS to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### **Accelerated pathway requirements**

1. At least 1.0 credit in EURUS courses (5000 level or higher).
2. Minimal overall CGPA of at least A-.

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### **Qualifying Year**

Applicants who have a three-year non-honours bachelor's degree in one of the disciplines represented in the program, or who lack sufficient area studies or language training, may be admitted to a qualifying-year program designed to raise their status to that of honours graduates in European, Russian and Eurasian Studies. Students are expected to achieve a B+ average or better in the qualifying-year program in order to qualify for admission to the Master's year.

### **Co-operative Education**

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

### **Application Requirements**

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

### **Participation Requirements**

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.

- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

### **Co-op Participation Agreement**

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

### **Communication with the Co-op Office**

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

### **Graduation with the Co-op Designation**

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

### **Employment**

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

### **Work Term Assessment and Evaluation**

#### **Work Term Evaluation**

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

#### **Work Term Assessment**

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

### **Voluntary Withdrawal from the Co-op Option**

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

### **Involuntary or Required Withdrawal from the Co-op Option**

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### **International Students**

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

### **Co-op Fees**

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

### **European, Russian and Eurasian Studies Co-operative Education Option**

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the M.A. in European, Russian and Eurasian Studies;
2. have successfully completed, by the start-date of the first work term:
  - a. EURR 5001 [0.5] Interdisciplinary Seminar in European, Russian and Eurasian Studies
  - b. EURR 5010 Research Design and Methodology in European, Russian and Eurasian Studies
3. be registered as a full-time student in each academic term prior to a work term;
4. be eligible to work in Canada (for off-campus work terms)

For more information, please refer to the Co-operative Education Policy.

### **European and Russian Studies (EURR) Courses**

#### **EURR 5001 [0.5 credit]**

#### **Interdisciplinary Seminar in European, Russian and Eurasian Studies**

Current debates and methodological approaches within various academic disciplines relating to Europe, Russia, and Eurasia.

Prerequisite(s): permission of the Institute or enrolment in the EURUS program.

#### **EURR 5002 [0.5 credit]**

#### **Post-Soviet States and Societies**

The relationship between social forces and state structures at both the national and local levels in the USSR and the post-soviet states.

Also listed as PSCI 5110.

Also offered at the undergraduate level, with different requirements, as EURR 4002, PSCI 4502, for which additional credit is precluded.

#### **EURR 5008 [0.5 credit]**

#### **Nationalism in Russia and Eurasia**

Ethnic basis of nationalism in the region. Ethnic politics and trends.

Also offered at the undergraduate level, with different requirements, as EURR 4008, for which additional credit is precluded.

#### **EURR 5010 [0.5 credit]**

#### **Research Design and Methodology in European, Russian and Eurasian Studies**

Examination of various issues in research design and methodology, with examples from the academic literature. Discussion of student research proposals.

Includes: Experiential Learning Activity

Precludes additional credit for EURR 5200 (no longer offered) and EURR 5300 (no longer offered).

#### **EURR 5100 [0.5 credit]**

#### **Nation-Building in Central and Eastern Europe**

Processes of nation-building in the region examined in terms of a particular country, or set of countries. Country focus may vary.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as EURR 4100, for which additional credit is precluded.

**EURR 5101 [0.5 credit]****Russian Domestic Politics**

Examination of the evolution of Russian domestic politics and society since the collapse of the Soviet Union. Themes discussed include the transformation of Russia's political system, changes in the behavior of political elites, the evolution of Russia's social structure, and federal-regional relations.

Also listed as PSCI 5112.

**EURR 5102 [0.5 credit]****The International Political Economy of Transition**

Problems of reintegration into the world economy and dilemmas of transition from command to market economies. Topics may include new trade and investment patterns, role in regional and international economic organizations, search for appropriate exchange rate policies, impact of Western assistance.

Also listed as INAF 5802.

**EURR 5104 [0.5 credit]****European Integration and European Security**

A seminar focusing on security issues related to the formation of supra-national decision-making structures in Europe.

Includes: Experiential Learning Activity

Also listed as PSCI 5608.

Also offered at the undergraduate level, with different requirements, as EURR 4104, for which additional credit is precluded.

**EURR 5105 [0.5 credit]****European Economic Integration**

Economic issues and policies related to the process of European integration and the development of the post-World War II European Union.

Also listed as INAF 5803.

Prerequisite(s): ECON 1000.

**EURR 5106 [0.5 credit]****Selected Topics in European Integration Studies**

Selected topics related to post-World War II European integration.

Also listed as PSCI 5609.

**EURR 5107 [0.5 credit]****Russia's Regional and Global Ambitions**

This course examines domestic conditions in Russia from 2000 to the present and the framing of Russia's foreign policy and strategic objectives towards the former Soviet republics and other key global actors, including the United States, the European Union, NATO and China.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as EURR 4107, for which additional credit is precluded.

**EURR 5108 [0.5 credit]****Canada-EU Relations: Summer Module**

Relations between Canada and Europe in the context of European integration, with attention to policy issues affecting the relationship and/or areas of common policy challenges.

Also listed as PSCI 5103.

Precludes additional credit for EURR 5106 and PSCI 5609 if taken in the summer of 2003-2004 or 2004-05.

Prerequisite(s): previous course in European integration or permission of the instructor.

**EURR 5109 [0.5 credit]****The EU in International Affairs**

The impact of the EU on international affairs; the internal development of the EU, the evolution of integration theory, and the growth of the EU's external relations capabilities.

Includes: Experiential Learning Activity

Also listed as INAF 5805.

**EURR 5111 [0.5 credit]****The Politics of Autocracy in Russia and Eurasia**

Examination of autocratic regimes and politics since the Soviet era. Topics include autocratization and democratic reversals, varieties of authoritarian rule, electoral authoritarianism, patron-client relations, protest and coercion, autocratic practices and institutions, and authoritarian law.

**EURR 5113 [0.5 credit]****Democracy in the European Union**

Survey of empirical research and normative theorizing about democracy in the EU. Topics include: European Parliament and other channels for democratic input, patterns of citizen participation, impact of European integration on democracy in EU member states, Euroscepticism, theories of EU democracy.

Also listed as PSCI 5113.

**EURR 5201 [0.5 credit]****Special Topics in European Studies**

Selected topics related to Europe and/or the European Union.

**EURR 5202 [0.5 credit]****Special Topics in Russian and Eurasian Studies**

Selected topics related to the communist and post-communist states and processes of transition they are undergoing.

Also offered at the undergraduate level, with different requirements, as EURR 4202, for which additional credit is precluded.

**EURR 5204 [0.5 credit]****Central Europe, Past and Present**

Evolution and current status of Central Europe from periods of foreign control in the late nineteenth and twentieth centuries to independent statehood. Emphasis on national accommodations and conflicts.

Also listed as HIST 5604.

Also offered at the undergraduate level, with different requirements, as EURR 4204, for which additional credit is precluded.

**EURR 5205 [0.5 credit]****The European Union and its Eastern Neighbours**

The EU's European Neighbourhood Policy and Eastern partnership policy, the Russia-EU "strategic partnership". Policies and reactions of non-EU East European countries toward the EU. The interaction of Member state policies and EU policies. May include attention to historical legacies, cultural factors, public opinion, energy security.

Includes: Experiential Learning Activity

Also listed as INAF 5807, PSCI 5111.

**EURR 5301 [0.5 credit]****Internship and Applied Policy Skills**

A seminar accompanying an unpaid internship placement to develop workplace and applied policy skills. Relating applied experience to academic literature. Writing skills for an applied policy setting. Internship placement: 12 days over 12 weeks.

Includes: Experiential Learning Activity

Prerequisite(s): Open only to EURUS MA students with a minimum B+ average and placement in an internship position in the same semester or in the previous semester (based on a competitive application process).

Also offered at the undergraduate level, with different requirements, as EURR 4206, for which additional credit is precluded.

**EURR 5302 [0.5 credit]****EU Summer Study Abroad**

This course is open only to students in approved summer study options in Europe, particularly the EU Study Tour.

Includes: Experiential Learning Activity

Prerequisite(s): approval of the Institute.

Also offered at the undergraduate level, with different requirements, as EURR 4302, for which additional credit is precluded.

**EURR 5303 [0.5 credit]****Contemporary Europe: From Postwar to the European Union**

History of contemporary Europe from 1945 to present covering both eastern and western halves of the continent and including social, cultural, political, and economic dimensions.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as EURR 4303, HIST 4606, for which additional credit is precluded.

**EURR 5304 [0.5 credit]****Europe and International Migration**

Europe's role in international migration. Topics to be discussed may include migration and mobility as both assets and challenges for sending, transit, and destination countries, changing geographies of migration, inclusion and exclusion, political mobilization, and responses of European states and other actors.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as EURR 4304, for which additional credit is precluded.

**EURR 5305 [0.5 credit]****Imperial Russia and the Russian Revolution**

Examination of the expansion and downfall of tsarist Russia from the eighteenth century to the revolutionary era and the establishment of Bolshevik rule. Topics include the relationship between the monarchy and subject peoples, social and economic change, and daily life.

Includes: Experiential Learning Activity

Also listed as HIST 5607.

Precludes additional credit for EURR 4203 (no longer offered), EURR 5203 (no longer offered), HIST 4603 (no longer offered), HIST 5603 (no longer offered).

Also offered at the undergraduate level, with different requirements, as EURR 4305, for which additional credit is precluded.

**EURR 5306 [0.5 credit]****The Soviet Union: Power and Culture**

Examination of the rise of the Soviet Union to a global power and subsequent tensions that promoted its collapse. The course will analyze Stalinism, the Second World War, the Thaw, and Brezhnev and Gorbachev eras through the lens of the USSR's citizens.

Includes: Experiential Learning Activity

Also listed as HIST 5608.

Precludes additional credit for EURR 4203 (no longer offered), EURR 5203 (no longer offered), HIST 4603 (no longer offered), HIST 5603 (no longer offered).

Also offered at the undergraduate level, with different requirements, as EURR 4306, for which additional credit is precluded.

**EURR 5307 [0.5 credit]**  
**Topics in Migration and Diaspora: Europe, Russia and Eurasia**

Topics in European, Russian and Eurasian Studies with a focus on migration and diaspora in Europe, Russia and Eurasia.

Also listed as MGDS 5202.

**EURR 5900 [0.5 credit]**  
**Tutorial in Russian and Eurasian Studies**

Directed readings on selected aspects of Russian and Eurasian issues.

Prerequisite(s): permission of the Institute.

**EURR 5902 [0.5 credit]**  
**Tutorial in European and European Union Studies**

Directed readings on selected aspects of European and European Union issues.

Prerequisite(s): permission of the Institute.

**EURR 5908 [1.0 credit]**

**Research Essay**

A research essay on a topic relating to European, Russian or Eurasian Studies.

Includes: Experiential Learning Activity

**EURR 5909 [2.0 credits]**

**M.A. Thesis**

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Institute.

**EURR 5913 [0.0 credit]**

**Co-operative Work Term**

Includes: Experiential Learning Activity

Prerequisite(s): registration in the Co-operative Education Program option in the M.A. program in European, Russian, and Eurasian Studies.

## Film Studies

This section presents the requirements for programs in:

- **M.A. Film Studies**
- **M.A. Film Studies with Collaborative Specialization in African Studies**
- **M.A. Film Studies with Collaborative Specialization in Digital Humanities**

### Program Requirements

Students admitted to the Film Studies M.A. will initially be enrolled in the Coursework Stream. By November 1 of their first term, students may apply to be transferred to either the Research Essay Stream or the Thesis Stream.

### M.A. Film Studies (4.0 credits)

#### Requirements - Thesis Stream (4.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	
<b>2. 1.5 credits in Film Studies graduate course work, excluding FILM 5801</b>		<b>1.5</b>
<b>3. 1.5 credits in:</b>		<b>1.5</b>
FILM 5909 [1.5]	M.A. Thesis	
<b>Total Credits</b>		<b>4.0</b>

**Note:** for **Item 2** above, students may take 0.5 credit of coursework outside the Film Studies program subject to the approval of the Graduate Supervisor. This 0.5 credit may be a 4000-level Film Studies course.

#### Requirements - Research Essay Stream (4.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	
<b>2. 2.0 credits in Film Studies graduate course work, 0.5 credit of which can include:</b>		<b>2.0</b>
FILM 5801 [0.5]	Graduate Internship (see Note, below)	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
FILM 5908 [1.0]	Research Essay	
<b>Total Credits</b>		<b>4.0</b>

**Note:** for **Item 2** above, students may take 0.5 credit of coursework outside the Film Studies M.A. program subject to the approval of the Graduate Supervisor. This 0.5 credit may be a 4000-level Film Studies course.

#### Requirements - Coursework Stream (4.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	
<b>2. 3.0 credits in Film Studies graduate course work, 0.5 credit of which can include:</b>		<b>3.0</b>

FILM 5801 [0.5]	Graduate Internship
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**Total Credits** **4.0**

**Note:** for **Item 2** above, students may take up to 1.0 credit of graduate coursework outside the Film Studies M.A. program subject to the approval of the Graduate Supervisor. Students may request departmental approval for 0.5 of this 1.0 credit to be a 4000-level Film Studies course.

### M.A. Film Studies with Collaborative Specialization in African Studies (4.0 credits)

#### Requirements - Thesis Stream (4.0 credits)

**1. 0.5 credit in:** **0.5**

AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
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**2. 0.0 credit in:** **0.0**

AFRI 5800 [0.0]	Scholarly Preparation in African Studies
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**3. 1.0 credit in:** **1.0**

FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I
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FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II
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**4. 1.0 credit in** Film Studies graduate course work, **1.0**  
excluding FILM 5801

**5. 1.5 credits in:** **1.5**

FILM 5909 [1.5]	M.A. Thesis
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**Total Credits** **4.0**

#### Requirements - Research Essay Stream (4.0 credits)

**1. 0.5 credit in:** **0.5**

AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
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**2. 0.0 credit in:**

AFRI 5800 [0.0]	Scholarly Preparation in African Studies
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**3. 1.0 credit in:** **1.0**

FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I
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FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II
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**4. 1.5 credits in** Film Studies graduate course work, 0.5 **1.5**  
credit of which can include:

FILM 5801 [0.5]	Graduate Internship
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**5. 1.0 credit in:** **1.0**

FILM 5908 [1.0]	Research Essay
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**Total Credits** **4.0**

#### Requirements - Coursework Stream (4.0 credits)

**1. 0.5 credit in:** **0.5**

AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
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**2. 0.0 credit in:** **0.0**

AFRI 5800 [0.0]	Scholarly Preparation in African Studies
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**3. 1.0 credit in:** **1.0**

FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I
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FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II
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**4. 1.5 credits in** Film Studies graduate course work, 0.5 **1.5**  
credit of which can include:

FILM 5801 [0.5]	Graduate Internship
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**5. 1.0 credit from:** **1.0**

AFRI 5050 [0.5]	Selected Topics in African Studies
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AFRI 5100 [0.5]	African Studies Abroad
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AFRI 5700 [0.5]	Directed Readings in African Studies
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Students may also take courses designated as having sufficient African Studies content, as approved by both the Graduate Supervisor in Film Studies and the Graduate Coordinator of the Institute of African Studies.

**Total Credits** **4.0**

**Note:** for **Item 4** above, students may take a 0.5 credit Film Studies course at the 4000-level subject to the approval of the Graduate Supervisor

### M.A. Film Studies with Collaborative Specialization in Digital Humanities (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

**1. 1.0 credit in:** **1.0**

FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I
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FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II
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**2. 1.5 credits in** Film Studies graduate course work, **1.5**  
excluding FILM 5801

**3. 1.5 credits in:** **1.5**

FILM 5909 [1.5]	M.A. Thesis (in the specialization)
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**4. 0.5 credit in:** **0.5**

DIGH 5000 [0.5]	Issues in the Digital Humanities
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**5. 0.5 credit in** DIGH (DIGH 5011, DIGH 5012, or **0.5**  
annually-listed DIGH course)

**6. 0.0 credit in** DIGH 5800 **0.0**

**Total Credits** **5.0**

#### Requirements - Research essay pathway (5.0 credits)

**1. 1.0 credit in:** **1.0**

FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I
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FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II
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**2. 2.0 credits in** Film Studies graduate course work, 0.5 **2.0**  
credit of which can include:

FILM 5801 [0.5]	Graduate Internship
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**3. 1.0 credit in:** **1.0**

FILM 5908 [1.0]	Research Essay (in the specialization)
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**4. 0.5 credit in:** **0.5**

DIGH 5000 [0.5]	Issues in the Digital Humanities
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**5. 0.5 credit in** DIGH (DIGH 5011, DIGH 5012, or **0.5**  
annually listed DIGH course)

**6. 0.0 credit in:** **0.0**

DIGH 5800 [0.0]	Digital Humanities: Professional Development
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**Total Credits** **5.0**

**Note:** for **Item 2** above, students may take 0.5 credit of coursework outside the Film Studies program subject to the approval of the Graduate Supervisor. This credit may be a 4000-level Film Studies course.

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
FILM 5010 [0.5]	Film Theory, History, and Critical Methodologies I	
FILM 5020 [0.5]	Film Theory, History, and Critical Methodologies II	
<b>2. 2.5 credits in</b>	Film Studies graduate course work, 0.5 credit of which can include:	<b>2.5</b>
FILM 5801 [0.5]	Graduate Internship	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>4. 1.0 credit in</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	<b>1.0</b>
<b>5. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>5.0</b>

**Note:** for **Item 2** above, students may take a 0.5 credit Film Studies course at the 4000-level subject to the approval of the Graduate Supervisor.

#### Guidelines for Completion of M.A. Film Studies

- Full-time students in the thesis stream are expected to finish all requirements for the degree, with the exception of FILM 5909, during their first two terms of study, and part-time students by the end of the fifth term. The thesis requirement is designed to take two or three additional terms.
- Full-time students in the research essay stream are expected to finish all requirements for the degree, with the exception of FILM 5908 during their first two terms of study, and part-time students by the end of the fifth term. Full-time students are expected to complete the research essay by the end of the third term and part time students during the sixth term.

#### Thesis/Research Essay Proposal

- Students who wish to be admitted into the thesis stream will submit a thesis proposal to the Film Studies Graduate committee no later than November 1 of the first year of registration for students enrolled full time, and no later than the middle of the third term of registration for students enrolled part time.
- Students who wish to be admitted into the research essay stream will submit a research proposal to the Film Studies Graduate committee no later than November 1 of the first year of registration for students enrolled full time, and no later than the middle of the third term of registration for students enrolled part time. The topic should concern research undertaken after admission into the program.

#### Language Requirements

A reading knowledge of French (or another language approved by the Film Studies Graduate Supervisor) is required.

## Regulations

See the General Regulations section of this Calendar.

A standing of B- or better must be obtained in each course counted towards the master's degree.

## Admission

The minimum requirement for admission to the master's program is a B.A. Honours or the equivalent in film studies or a related discipline with, normally, B+ in the honours subject and B- or higher overall. Related disciplines might include mass communication, art history, literature, Canadian studies, women's studies, and history. Successful applicants will be admitted to the Coursework stream, with the option of applying to be transferred to either the Research Essay stream or the Thesis stream at the beginning of the second term. Applicants without a background in film studies may be required to take a maximum of two full credits from designated courses in the undergraduate Film Studies program in addition to their normal M.A. program requirements.

Applicants who lack an honours degree, but who have a three-year degree in film studies or a related discipline with a minimum standing of B+, may be admitted to a Post-Baccalaureate in Film Studies. Students who complete the Post-Baccalaureate in Film Studies requirements with a CGPA of 10.4 or higher will be considered for admission to the master's program. The regulations governing the Post-Baccalaureate are outlined in the General Regulations section of this calendar.

## Film Studies (FILM) Courses

### FILM 5001 [0.5 credit]

#### Directed Readings and Research

Tutorials designed to permit students to pursue research on topics in film studies which have been chosen in consultation with members of faculty.

Includes: Experiential Learning Activity

### FILM 5002 [0.5 credit]

#### Special Topics

Selected topics in film studies not available in the regular course program.

### FILM 5010 [0.5 credit]

#### Film Theory, History, and Critical Methodologies I

Recent developments in film theory and history, with emphasis on the themes and concepts informing the development of the discipline of film studies, and training in methodologies for critical, theoretical and historical research in film studies.

Precludes additional credit for FILM 5000 (no longer offered).

**FILM 5020 [0.5 credit]****Film Theory, History, and Critical Methodologies II**

Building on the skills and knowledge developed in FILM 5010, the course examines recent developments in film theory and history. Emphasis on themes and concepts informing the discipline of film studies, and methodologies for critical, theoretical and historical research in film studies.

Precludes additional credit for FILM 5000 (no longer offered).

Prerequisite(s): FILM 5010 or permission of the instructor.

**FILM 5106 [0.5 credit]****Cinema and Technology**

Selected aspects of the technological development of cinema, with emphasis on the impact of technological advances on film historiography and critical analysis.

**FILM 5107 [0.5 credit]****Topics in Film History**

Aspects of the history of cinema, with emphasis on periods, film movements, styles, genres and comparative approaches to national, regional and/or world-wide trends.

**FILM 5109 [0.5 credit]****Topics in Film and Philosophy**

Selected topics in philosophical approaches to the study of film, and an examination of the relations between film theory and philosophical aesthetics.

Also offered at the undergraduate level, with different requirements, as FILM 4301, for which additional credit is precluded.

**FILM 5203 [0.5 credit]****Issues in World Cinema**

Study of the theoretical and methodological issues raised by the concept of world cinema. Topics may include nationalism, transnationalism, translation, cosmopolitanism, local and regional vernaculars, co-productions, film festivals, multinational corporations and other phenomena associated to globalization.

**FILM 5205 [0.5 credit]****Topics in Hollywood Cinema**

Examination of Hollywood cinema relative to recent research into Hollywood's impact on film aesthetics, technology, economics and culture.

**FILM 5209 [0.5 credit]****Critical Perspectives on Canadian Cinema**

Current critical and historical approaches to Canadian film, with emphasis on institutions, aesthetic traditions and cultural practices.

**FILM 5401 [0.5 credit]****Studies in Authorship**

Examination of the work of one or two filmmakers, with a concern for recent ideas about the concept of authorship and the formation of artistic and critical reputations.

**FILM 5500 [0.5 credit]****Advanced Film Analysis**

Issues and approaches to the detailed analysis of particular film texts. Work in narratology, hermeneutics, discourse analysis, psychoanalysis, deconstruction and semiotics will provide the methodological background to the study of individual films.

**FILM 5506 [0.5 credit]****Topics in Culture, Identity and Representation**

Current critical approaches to the study of identity in cinema. Topics will vary from year to year, and may include race, ethnicity and sexuality, and the geopolitical implications of colonialism and post-colonialism.

**FILM 5601 [0.5 credit]****Studies in Genre**

The theory and practice of film genres will be the object of study in this course.

**FILM 5701 [0.5 credit]****Topics in Animation**

Institutional histories, the work of individual animators, modes of production, and the social function of animation represent topics to be covered by this course.

**FILM 5801 [0.5 credit]****Graduate Internship**

This course provides students with the opportunity to gain practical experience by working on film-related projects under the supervision of staff at a museum, gallery, archive, exhibition venue or government agency. Graded SAT/UNS.

Includes: Experiential Learning Activity

**FILM 5908 [1.0 credit]****Research Essay**

Individual project on a topic of the student's choice involving research undertaken after admission into the program and supervised by a faculty member.

Includes: Experiential Learning Activity

**FILM 5909 [1.5 credit]****M.A. Thesis**

Includes: Experiential Learning Activity

## Finance

This section presents the requirements for programs in:

- **Master of Finance**

### Program Requirements

#### Master of Finance (7.25 credits)

##### Requirements:

<b>1. 2.0 credits in:</b>	<b>2.0</b>
BUSI 5510 [0.5]	Data Science for Business
ECON 5022 [0.5]	Economic Theory for Financial Analysis
ECON 5054 [0.5]	Applied Financial Econometrics
FINA 5506 [0.5]	Financial Statement Analysis
<b>2. 4.25 credits in:</b>	<b>4.25</b>
FINA 5505 [0.25]	Corporate Finance - Master of Finance
FINA 5511 [0.25]	Investments
FINA 5514 [0.25]	International Finance
FINA 5516 [0.25]	Derivatives
FINA 5518 [0.25]	Alternative Investments
FINA 5519 [0.25]	Financial Risk Management
FINA 5522 [0.25]	Financial Technology
FINA 5523 [0.25]	Financial Analytics
FINA 5524 [0.25]	Financial Markets and Institutions
FINA 5525 [0.25]	Sustainable Finance
FINA 5526 [0.25]	Financial Modeling
FINA 5527 [0.25]	Portfolio Management
FINA 5528 [0.25]	Equity Analysis 1
FINA 5529 [0.25]	Equity Analysis 2
FINA 5531 [0.25]	Fixed Income Analysis 1
FINA 5532 [0.25]	Fixed Income Analysis 2
FINA 5533 [0.25]	Ethics
<b>3. 1.0 credit in:</b>	<b>1.0</b>
FINA 5599 [1.0]	Professional Internship
FINA 5998 [0.0]	MFin Skills Workshop
<b>Total Credits</b>	<b>7.25</b>

### Admission Requirements

M. Finance applicants are expected to hold a bachelor's degree or equivalent in business, economics, mathematics, statistics, actuarial science, data science, computer science, engineering, or other quantitatively oriented program with a minimum overall average of B.

Preference would be given to applicants who:

- Passed CFA Level 1 exam
- Passed CPA Common Final Examination
- Obtained designations in risk management (FRM, PRM, etc.)
- Obtained actuarial designation (ACIA, FCIA, etc.)

Proficiency in English is necessary to pursue graduate studies at Carleton University. See Section 3.6 of the General Regulations of this Calendar for English proficiency rules.

## Regulations - M. Finance

### Guidelines for Completion

Admitted students must normally complete their degree requirements within four terms after the date of initial registration.

### Academic Standing

A grade of B- or higher is normally required in each credit counted towards the degree. However, a candidate may, with the recommendation of the School and the approval of the Vice Provost (Graduate Studies), be allowed to count a grade of C+ in 0.75 credit.

Withdrawal from the program will be required if a Master of Finance student:

- Receives a grade of lower than B- in 1.25 credits or more, or
- Fails to achieve a weighted GPA of 7.0 after completing 2.0 credits of study, or to maintain it, or
- Receives a grade lower than C+ in the same course more than once.

### Financial Management (FINA) Courses

#### FINA 5501 [0.25 credit]

##### Financial Management

Overview of finance from the perspective of the financial manager. Corporate governance issues, financial markets, time value of money, valuation and yields of financial securities, capital budgeting, financial statement analysis, and the trade-off between risk and return.

Precludes additional credit for BUSI 5504.

Prerequisite(s): ACCT 5001 and BUSI 5801.

#### FINA 5502 [0.25 credit]

##### Corporate Finance

Aspects of corporate finance of most concern to managers: investment, financing and payout decisions, corporate restructuring. Case studies will be used.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5501.

#### FINA 5505 [0.25 credit]

##### Corporate Finance - Master of Finance

Aspects of corporate finance of most concern to managers: investment, financing and payout decisions, corporate governance. Case studies will be used.

Includes: Experiential Learning Activity

Precludes additional credit for FINA 5502.

Prerequisite(s): enrolment in Master of Finance program.

**FINA 5506 [0.5 credit]****Financial Statement Analysis**

Analysis and interpretation of an entity's financial statements and annual report from a user perspective. Ratio analysis is used to analyze firm performance and make forecasts of future performance. Prerequisite(s): enrolment in Master of Finance program. Also offered at the undergraduate level, with different requirements, as BUSI 4506, for which additional credit is precluded.

**FINA 5511 [0.25 credit]****Investments**

The analytical foundations and tools necessary for successful decision-making by investment managers and analysts and by individual investors. Includes a significant hands-on component. Prerequisite(s): FINA 5502 or FINA 5505.

**FINA 5512 [0.25 credit]****Valuation**

Valuation techniques needed for enterprise valuation. The identification of value drivers, insights into the valuation of companies in different settings. Step-by-step procedures for valuing businesses. Includes a team case analysis and presentation. Includes: Experiential Learning Activity Prerequisite(s): FINA 5502.

**FINA 5513 [0.25 credit]****Mergers and Acquisitions**

Theory and practice of mergers and acquisitions. Skills needed to be effective in mergers and acquisitions. Best practices in deal origination, design, implementation and post merger integration. Precludes additional credit for BUSI 5500. Prerequisite(s): FINA 5502.

**FINA 5514 [0.25 credit]****International Finance**

Issues encountered by the multinational financial manager in making financing and investment decisions within a global context. Foreign exchange markets, parity conditions, currency quotation methods, management of foreign exchange/political risk and international capital budgeting. Prerequisite(s): FINA 5502 or FINA 5505.

**FINA 5515 [0.5 credit]****Micro Finance**

Introduces students to the theory and practice of microfinance. Provides students with a comprehensive understanding of microfinance, its achievements, its current challenges, and the basic skills needed to manage microfinance institutions (MFIs). Serves as a forum to reflect on the future of microfinance and of. Includes: Experiential Learning Activity Prerequisite(s): FINA 5502. Also offered at the undergraduate level, with different requirements, as BUSI 4515, for which additional credit is precluded.

**FINA 5516 [0.25 credit]****Derivatives**

Derivative instruments and their use for speculation and hedging. Analysis of different markets where instruments trade, and their characteristics. Pricing models highlighted to determine how individuals and corporations can better manage risk. Prerequisite(s): FINA 5505.

**FINA 5518 [0.25 credit]****Alternative Investments**

Introduction to a wide range of alternative investments (hedge funds, private equity, real estate, infrastructure, and others), their risk and return, performance measurement, and important considerations when making investment decisions. Prerequisite(s): FINA 5511 and enrolment in the Master of Finance program.

**FINA 5519 [0.25 credit]****Financial Risk Management**

Principles and techniques of risk management for individuals and organizations. Discussion and measurement of major types of risk (market risk, credit risk, liquidity risk, operational risk). Instruments for hedging risks. Prerequisite(s): FINA 5516.

**FINA 5521 [0.25 credit]****Financial Management Concentration Integration**

Integrates and applies all the accounting and finance concentration coursework. Critical thinking is stressed via the case study approach. Focuses on complex problems and allows students to gain a deeper understanding of the salient issues discussed within the financial management concentration. Includes: Experiential Learning Activity Precludes additional credit for BUSI 5500. Prerequisite(s): FINA 5511 and FINA 5513.

**FINA 5522 [0.25 credit]****Financial Technology**

Explores emerging technologies in financial markets; and more broadly, examine the role of technological advancement and disruption in markets. Topics include blockchain and cryptocurrencies, robo-advising, peer-to-peer lending, the role of social media in financial markets, algorithmic and high-frequency trading, and artificial intelligence and applications.

Prerequisite(s): FINA 5502 or FINA 5505.

**FINA 5523 [0.25 credit]****Financial Analytics**

Developing statistical models and using simulations to understand financial data using R. Awareness of financial models related to investments and corporate finance and ability to write simple code in R to implement the models in real-world scenarios and to visualize and analyze financial data.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5510 and FINA 5511.

**FINA 5524 [0.25 credit]****Financial Markets and Institutions**

Examines the form and function of various financial institutions and their role in the intermediation process as suppliers of funds as well as the form and function of specific financial markets.

Prerequisite(s): enrolment in the Master of Finance program.

**FINA 5525 [0.25 credit]****Sustainable Finance**

Theoretical and practical application of sustainable finance principles and mechanisms to business issues. Sustainable investments and sustainable finance products. The motivations for sustainability of financial institutions, institutional investors, and their role in speeding up the transition to a sustainable economy.

Prerequisite(s): FINA 5505.

**FINA 5526 [0.25 credit]****Financial Modeling**

The course is focused on the skills and knowledge required to build a spreadsheet-based financial model of a company.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in Master of Finance program.

**FINA 5527 [0.25 credit]****Portfolio Management**

Introducing students to the concepts of investment mix within the overarching Investment Policy Statement of the portfolio. Determining how best to match investments with the objective of the fund, while optimizing risk-adjusted returns.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5511 and enrolment in the Master of Finance program.

**FINA 5528 [0.25 credit]****Equity Analysis 1**

Analysis of companies from a fundamental perspective using different types of corporate equity valuation techniques. Types of equity securities and markets, different equity valuation methods; industry and company analysis.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the Master of Finance program.

**FINA 5529 [0.25 credit]****Equity Analysis 2**

Advanced concepts related to equity valuation, risk management and portfolio management. Passive and active portfolio management and performance evaluation, quantitative and fundamental equity strategies, and advanced valuation methods for estimating a company's intrinsic value including approaches for valuing private companies.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5528.

**FINA 5531 [0.25 credit]****Fixed Income Analysis 1**

Fixed income securities and markets. Fixed-income valuation and return analysis. The term structure of interest rates and yield-spread analysis. Analysis of interest-rate risk and embedded options.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the Master of Finance program.

**FINA 5532 [0.25 credit]****Fixed Income Analysis 2**

Mortgage and asset-based securities; structured products. Analysis of credit risk. Interest rate and credit risk derivatives. Fixed income portfolio management strategies.

Includes: Experiential Learning Activity

Prerequisite(s): FINA 5531.

**FINA 5533 [0.25 credit]****Ethics**

Ethical decisions faced by finance professionals.  
Covers CFA Institute Code of Ethics and Standards of Professional Conduct.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in Master of Finance program.

**FINA 5599 [1.0 credit]****Professional Internship**

Application of MFin course knowledge and building management skills in a professional environment.  
Minimum 480 hours.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in Master of Finance program.

**FINA 5998 [0.0 credit]****MFin Skills Workshop**

Provides preparation for the MFin internship as well as professional and career development. The course is graded SAT/UNSAT based on attendance and engagement.

Includes: Experiential Learning Activity

Also listed as BUSI 5998.

## Geography

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This section presents the requirements for programs in:

- **M.A. Geography**
- **M.A. Geography with Collaborative Specialization in Accessibility**
- **M.A. Geography with Collaborative Specialization in African Studies**
- **M.A. Geography with Collaborative Specialization in Climate Change**
- **M.Sc. Geography with Collaborative Specialization in Climate Change**
- **M.A. Geography with Collaborative Specialization in Data Science**
- **M.A. Geography with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.Sc. Geography**
- **M.Sc. Geography with Collaborative Specialization in Data Science**
- **Ph.D. Geography**
- **Ph.D. Geography with Collaborative Specialization in Political Economy**

**Program Requirements****M.A. Geography (5.0 credits)****Requirements - Thesis pathway**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
GEOG 5000 [0.5]	Approaches to Geographical Inquiry	
<b>2. 2.5 credits in:</b>		<b>2.5</b>
GEOG 5909 [2.5]	M.A. Thesis (which must be defended at an oral examination)	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
GEOG 5905 [0.5]	Masters Research Workshop	
<b>4. 1.0 credit in</b>	approved GEOG/GEOM courses. With departmental permission, up to 1.0 credit may be taken from other units in the Faculty of Arts and Social Sciences/ Faculty of Public and Global Affairs. Coursework must fulfil the "Graduate-level Course Requirements" in the Graduate Regulations.	<b>1.0</b>
<b>5. 0.5 credit in</b>	free elective	<b>0.5</b>
6. In addition to the formal requirements, M.A. students are required to attend the Departmental Seminar series, and the Graduate Field Camp.		
<b>Total Credits</b>		<b>5.0</b>

**Requirements - Research essay pathway:**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
GEOG 5000 [0.5]	Approaches to Geographical Inquiry	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
GEOG 5908 [1.0]	M.A. Major Research Essay	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
GEOG 5905 [0.5]	Masters Research Workshop	

4. **3.0 credits** in approved GEOG/GEOM courses. With departmental permission, up to 1.0 credit may be taken from other units in the Faculty of Arts and Social Sciences/ Faculty of Public and Global Affairs. Coursework must fulfil the "Graduate-level Course Requirements" in the Graduate Regulations.

5. In addition to the formal requirements, M.A. students are required to attend the Departmental Seminar series, and the Graduate Field Camp.

**Total Credits 5.0**

### M.A. Geography with Collaborative Specialization in Accessibility (5.5 credits)

#### Requirements:

1. **1.0 credit in:** 1.0

ACCS 5001 [0.5] Critical Disability Studies

ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar

2. **1.0 credit in:** 1.0

GEOG 5000 [0.5] Approaches to Geographical Inquiry

GEOG 5905 [0.5] Masters Research Workshop

3. **2.5 credits in:** 2.5

GEOG 5909 [2.5] M.A. Thesis (in the specialization and including oral examination of the thesis)

4. **1.0 credit in** approved graduate-level electives 1.0

5. In addition to the formal requirements, MA students are required to attend the Departmental Seminar series, and the Graduate Field Camp

**Total Credits 5.5**

### M.A. Geography with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

1. **0.5 credit in:** 0.5

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

2. **0.0 credit in:** 0.0

AFRI 5800 [0.0] Scholarly Preparation in African Studies

3. **1.0 credit in:** 1.0

GEOG 5000 [0.5] Approaches to Geographical Inquiry

GEOG 5905 [0.5] Masters Research Workshop

4. **2.5 credits in:** 2.5

GEOG 5909 [2.5] M.A. Thesis (in the specialization and including oral examination of the thesis)

5. **1.0 credit in** approved graduate-level electives 1.0

6. In addition to the formal requirements, MA students are required to attend the Departmental Seminar series, and the Graduate Field Camp.

**Total Credits 5.0**

### M.A. Geography with Collaborative Specialization in Climate Change (5.5 credits)

#### Requirements:

1. **1.0 credit in:** 1.0

CLIM 5000 [1.0] Climate Collaboration

2. **0.0 credit in:** 0.0

CLIM 5800 [0.0] Climate Seminar Series

3. **1.0 credit in:** 1.0

GEOG 5000 [0.5] Approaches to Geographical Inquiry

GEOG 5905 [0.5] Masters Research Workshop

4. **2.5 credits in:** 2.5

GEOG 5909 [2.5] M.A. Thesis (in the specialization and including oral examination of the thesis)

5. **1.0 credit in** approved graduate-level electives 1.0

6. In addition to the formal requirements, MA students are required to attend the Departmental Seminar series, and the Graduate Field Camp.

**Total Credits 5.5**

### M.Sc. Geography with Collaborative Specialization in Climate Change (5.5 credits)

#### Requirements:

1. **1.0 credit in:** 1.0

CLIM 5000 [1.0] Climate Collaboration

2. **0.0 credit in:** 0.0

CLIM 5800 [0.0] Climate Seminar Series

3. **1.0 credit in:** 1.0

GEOG 5001 [0.5] Modeling Environmental Systems

GEOG 5905 [0.5] Masters Research Workshop

4. **0.5 credit in** Physical Geography selected from: 0.5

GEOG 5002 [0.5] Quantitative Analysis for Geographical Research

GEOG 5103 [0.5] Hydrologic Principles and Methods

GEOG 5104 [0.5] Advanced Biogeography

GEOG 5107 [0.5] Field Study and Methodological Research

GEOG 5303 [0.5] Geocryology

GEOG 5307 [0.5] Soil Resources

GEOG 5803 [0.5] Seminar in Geomatics

GEOG 5804 [0.5] Geographic Information Systems

GEOG 5900 [0.5] Graduate Tutorial

up to 0.5 credit in GEOG or GEOM at the 4000 level, with departmental approval

5. **3.0 credits in:** 3.0

GEOG 5906 [3.0] M.Sc. Thesis (in the specialization and including oral examination of the thesis)

6. In addition to the formal requirements, M.Sc. students are required to attend the DGES Departmental Seminar series, and the Graduate Field Camp.

**Total Credits 5.5**

## M.A. Geography with Collaborative Specialization in Data Science (5.0 credits)

### Requirements:

<b>1. 0.5 credit in:</b>		0.5
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 0.5 credit in:</b>		0.5
GEOG 5000 [0.5]	Approaches to Geographical Inquiry	
<b>3. 2.5 credits in:</b>		2.5
GEOG 5909 [2.5]	M.A. Thesis (in the specialization and including oral examination of the thesis)	
<b>4. 0.5 credit in:</b>		0.5
GEOG 5905 [0.5]	Masters Research Workshop	
<b>5. 1.0 credit in approved graduate-level electives</b>		1.0
6. In addition to the formal requirements, M.A. students are required to attend the Departmental Seminar series, and the Graduate Field Camp.		
<b>Total Credits</b>		<b>5.0</b>

## M.A. Geography with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
GEOG 5000 [0.5]	Approaches to Geographical Inquiry	
GEOG 5905 [0.5]	Masters Research Workshop	
<b>4. 2.5 credits in:</b>		2.5
GEOG 5909 [2.5]	M.A. Thesis (in the specialization and including oral examination of the thesis)	
<b>5. 1.0 credit in approved graduate-level electives</b>		1.0
6. In addition to the formal requirements, MA students are required to attend the Departmental Seminar series, and the Graduate Field Camp.		
<b>Total Credits</b>		<b>5.0</b>

## M.Sc. Geography (5.0 credits)

### Requirements:

<b>1. 0.5 credit in:</b>		0.5
GEOG 5001 [0.5]	Modeling Environmental Systems	
<b>2. 0.5 credit in:</b>		0.5
GEOG 5905 [0.5]	Masters Research Workshop	
<b>3. 3.0 credits in:</b>		3.0
GEOG 5906 [3.0]	M.Sc. Thesis (must be defended at an oral examination)	
<b>4. 0.5 credit in Physical Geography selected from:</b>		0.5
GEOG 5002 [0.5]	Quantitative Analysis for Geographical Research	
GEOG 5103 [0.5]	Hydrologic Principles and Methods	

GEOG 5104 [0.5]	Advanced Biogeography	
GEOG 5107 [0.5]	Field Study and Methodological Research	
GEOG 5303 [0.5]	Geocryology	
GEOG 5307 [0.5]	Soil Resources	
GEOG 5803 [0.5]	Seminar in Geomatics	
GEOG 5804 [0.5]	Geographic Information Systems	
GEOG 5900 [0.5]	Graduate Tutorial	
GEOG 4004 [0.5]	Environmental Impact Assessment	
GEOG 4013 [0.5]	Cold Region Hydrology	
GEOG 4017 [0.5]	Global Biogeochemical Cycles	
GEOG 4101 [0.5]	Two Million Years of Environmental Change	
GEOG 4103 [0.5]	Water Resources Engineering	
GEOG 4104 [0.5]	Microclimatology	
GEOG 4108 [0.5]	Permafrost	
GEOM 4003 [0.5]	Remote Sensing of the Environment	
GEOM 4008 [0.5]	Advanced Topics in Geographic Information Systems	
Or from courses offered by departments in the Faculty of Science		
<b>5. 0.5 credit in free elective</b>		0.5
6. In addition to the formal requirements, M.Sc. students are required to attend the Departmental Seminar Series, and the Graduate Field Camp.		
<b>Total Credits</b>		<b>5.0</b>

### Notes

1. Only 0.5 credit towards the program may be obtained in GEOG 5900 Graduate Tutorial
2. Only 0.5 credit may be obtained at 4000 level.

## M.Sc. Geography with Collaborative Specialization in Data Science (5.0 credits)

### Requirements:

<b>1. 0.5 credit in:</b>		0.5
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 0.5 credit in:</b>		0.5
GEOG 5001 [0.5]	Modeling Environmental Systems	
<b>3. 0.5 credit in:</b>		0.5
GEOG 5905 [0.5]	Masters Research Workshop	
<b>4. 0.5 credit in Physical Geography selected from:</b>		0.5
GEOG 5002 [0.5]	Quantitative Analysis for Geographical Research	
GEOG 5103 [0.5]	Hydrologic Principles and Methods	
GEOG 5104 [0.5]	Advanced Biogeography	
GEOG 5107 [0.5]	Field Study and Methodological Research	
GEOG 5303 [0.5]	Geocryology	
GEOG 5307 [0.5]	Soil Resources	
GEOG 5803 [0.5]	Seminar in Geomatics	
GEOG 5804 [0.5]	Geographic Information Systems	
GEOG 5900 [0.5]	Graduate Tutorial	
up to 0.5 credit in GEOG or GEOM at the 4000 level, with departmental approval		
<b>5. 3.0 credits in:</b>		3.0

GEOG 5906 [3.0]	M.Sc. Thesis (in the specialization and including oral examination of the thesis)	
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6. In addition to the formal requirements, M.Sc. students are required to attend the DGES Departmental Seminar series, and the Graduate Field Camp.

**Total Credits** **5.0**

### Ph.D. Geography (2.0 credits)

#### Requirements:

**1. 1.0 credit in:** **1.0**

GEOG 6000 [0.5]	Doctoral Core Seminar: Geography, Society and the Environment
GEOG 6001 [0.5]	Doctoral Core Seminar: Research and Professional Practice

**2. 1.0 credit from:** **1.0**

GEOG 6003 [0.5]	Field Seminar: Geography of Societal Change
GEOG 6004 [0.5]	Field Seminar: Geography of Societal Change

GEOG 6006 [0.5]	Field Seminar: Geography of - Environmental Change
GEOG 6007 [0.5]	Field Seminar: Geography of - Environmental Change

3. Presentation and oral defence of the thesis proposal as outlined below

**4. 0.0 credit from:**

GEOG 6906 [0.0]	Comprehensive Examination: The - Geography of Societal Change
GEOG 6907 [0.0]	Comprehensive Examination: The Geography of Environmental Change

**5. 0.0 credits in** Thesis which must be defended at an oral examination **0.0**

GEOG 6909 [0.0]	Ph.D. Thesis
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6. In addition to the formal requirements, Ph.D. students are required to attend the Departmental Seminar series and the Graduate Field Camp.

**Total Credits** **2.0**

### Ph.D. Geography with Collaborative Specialization in Political Economy (2.0 credits)

#### Requirements:

**1. 1.0 credit in:** **1.0**

GEOG 6000 [0.5]	Doctoral Core Seminar: Geography, Society and the Environment
GEOG 6001 [0.5]	Doctoral Core Seminar: Research and Professional Practice

**2. 0.5 credit in:** **0.5**

PECO 6000 [0.5]	Political Economy: Core Concepts
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**3. 0.5 credit from:** **0.5**

GEOG 6003 [0.5]	Field Seminar: Geography of Societal Change
GEOG 6004 [0.5]	Field Seminar: Geography of Societal Change

**4. 0.0 credit in:** **0.0**

GEOG 6906 [0.0]	Comprehensive Examination: The - Geography of Societal Change
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5. Presentation and oral defence of the thesis proposal as outlined below

**6. 0.0 credits in:** **0.0**

GEOG 6909 [0.0]	Ph.D. Thesis (in the specialization, must be defended at an oral examination)
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7. In addition to the formal requirements, Ph.D. students are required to attend the Departmental Seminar series and the Graduate Field Camp.

**Total Credits** **2.0**

### Comprehensive Examination

Each doctoral candidate is required to write one comprehensive examination: GEOG 6906 or GEOG 6907, according to the chosen field of specialization

The comprehensive examination must be completed after course requirements for the Ph.D. have been completed. The examination will occur no later than the fourth term of registration in the Ph.D. program. Failure to complete the examination successfully will result in denial of permission to continue in the program.

### Thesis Proposal

Candidates normally register in the thesis on entry to the program and work actively to define their research topic during the first term of registration. The thesis proposal is normally presented after comprehensive requirements have been fulfilled. Candidates submit and defend the thesis proposal at an oral examination no later than the end of the 5th term of registration in the Ph.D. program. Continuous registration is required after initial registration in the thesis.

### Residence Requirements

All Ph.D. candidates must be registered full time in a minimum of six terms to satisfy the residence requirement.

### Regulations

See the General Regulations section of this Calendar.

### Admission Requirements

The requirement for admission into the master's program is a B.A. (Honours) or B.Sc. (Honours) in Geography or a related discipline, with at least B+ standing.

In exceptional cases, pertinent work experience may be considered in support of an application to the Department. Students entering the program from other disciplines or with academic deficiencies may be required to take additional courses.

### Accelerated Pathway

The accelerated pathway in the M.A. Geography program is a flexible and individualized plan of graduate study. Students in their final year of a Carleton B.A. or BSc. Honours degree in Geography, Geomatics, Environmental Studies or related discipline with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third-year of study should consult with both their Undergraduate Program Coordinator and the Department of Geography & Environmental Studies Graduate Program Supervisor to determine if

the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### **Accelerated Pathway Requirements**

1. At least 0.5 credit in GEOG courses (5000 level) with a grade of B+ or higher excluding GEOG 5000, 5001 and 5905.
2. Minimum overall CGPA of A-.

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### **Admission Requirements**

The normal requirement for admission into the M.Sc. program in Geography is a B.Sc. (Honours) or B.A. (Honours) in Physical Geography or a related discipline, with at least B+ standing.

Students entering the program from other disciplines or with academic deficiencies may be required to take additional courses.

The intended research area must be eligible for NSERC support.

Applicants for admission must provide an outline of their proposed project, which must be suitable for the M.Sc. program.

### **Accelerated Pathway**

The accelerated pathway in the M.Sc. Geography program is a flexible and individualized plan of graduate study. Students in their final year of a Carleton B.A. or BSc. Honours degree in Geography, Geomatics, Environmental Studies or related discipline with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third-year of study should consult with both their Undergraduate Program Coordinator and the Department of Geography & Environmental Studies Graduate Program Supervisor to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### **Accelerated Pathway Requirements**

1. At least 0.5 credit in GEOG courses (5000 level) with a grade of B+ or higher excluding GEOG 5000, GEOG 5001 and GEOG 5905.
2. Minimal overall CGPA of A-.

Students may receive advanced standing with transfer of credit of up to 1.0 credit, which can reduce their time to completion.

### **Admission**

The normal requirement for admission to the Ph.D. program is a master's degree (or the equivalent) in geography, with at least an A- average.

A student already registered in the M.A. or M.Sc. program who shows outstanding academic performance and research promise may be permitted to transfer

to the Ph.D. program with a recommendation by the Departmental graduate committee.

Applicants whose academic preparation has deficiencies in certain areas may be admitted to the Ph.D. program with the requirement that they complete additional course work.

Admission to the Ph.D. program is granted on a full-time basis in September for the fall term.

### **Geography (GEOG) Courses**

#### **GEOG 5000 [0.5 credit]**

##### **Approaches to Geographical Inquiry**

A review of the major philosophical perspectives shaping research and explanation by geographers. Particular attention is paid to interpretations of social structure and human action, the nature of the biophysical universe, and the interaction between human beings and their environments.

Includes: Experiential Learning Activity

#### **GEOG 5001 [0.5 credit]**

##### **Modeling Environmental Systems**

Methods and problems of research on the physical environment, with illustrative material taken from the atmospheric and surface earth sciences. Topics include: the identification and behaviour of environmental systems, temporal and spatial scale, experimental method under field conditions, and simulation and model development.

Includes: Experiential Learning Activity

#### **GEOG 5002 [0.5 credit]**

##### **Quantitative Analysis for Geographical Research**

Quantitative techniques and methods for research on the natural and cultural environment. Topics include sampling, experimental design, replication, variance, correlation, time series analysis, statistical uncertainty, simulation, calibration, validation.

Includes: Experiential Learning Activity

#### **GEOG 5003 [0.5 credit]**

##### **Critical Approaches to Qualitative Inquiry**

Development of critical skills in qualitative research by considering the relationship between theory and method. Engaged scholarship and participatory, community-based, action research. Practical experience with select methods including: interviews, personal narratives, focus groups, participant observation, archival research, discourse analysis, and visual methodologies.

Includes: Experiential Learning Activity

**GEOG 5005 [0.5 credit]****Global Environmental Change: Human Implications**

Global environmental change: its significance for societies, economies and international relations. Value systems underlying environmental discourse; political economy of the environment; sustainability and security. Environmental diplomacy and grassroots environmentalism. Regionalized impacts of pressures on natural environments; challenges of adaptation. Includes: Experiential Learning Activity  
Also listed as INAF 5701.

**GEOG 5006 [0.5 credit]****Special Topics in Geography of the Environment**

Research seminar on a selected theme within geographical approaches to environmental analysis. Topics will vary from year to year. Consult departmental website for current details.  
Includes: Experiential Learning Activity

**GEOG 5103 [0.5 credit]****Hydrologic Principles and Methods**

Advanced physical hydrology with emphasis on atmospheric moisture, precipitation, evaporation, infiltration, soil water physics, snow hydrology and runoff generation. Analytical approaches and methods to solve practical hydrological problems.  
Includes: Experiential Learning Activity

**GEOG 5104 [0.5 credit]****Advanced Biogeography**

Current methods and theories in paleoecology are examined: dendrochronology, paleolimnology and other techniques for examining past climates and environmental condition. Numerical approaches to climate change studies.  
Includes: Experiential Learning Activity

**GEOG 5107 [0.5 credit]****Field Study and Methodological Research**

Field acquisition and analysis of geographic material; supervised field observations and methodology. (Individual or group basis, by special arrangement.).  
Includes: Experiential Learning Activity

**GEOG 5201 [0.5 credit]****Special Topics in the Geography of Development**

Research seminar within geographical approaches to development focusing on a selected theme or region. Topics vary from year to year. Consult departmental website for current details.  
Includes: Experiential Learning Activity

**GEOG 5303 [0.5 credit]****Geocryology**

Development of ground ice in permafrost regions of Canada; ice segregation and pore-water expulsion during ground freezing; analytical and numerical approaches to modeling permafrost conditions.  
Includes: Experiential Learning Activity  
Prerequisite(s): GEOG 4108 or permission of the Department.

**GEOG 5307 [0.5 credit]****Soil Resources**

Physical, mineralogical, chemical, and other properties of soils will be studied in agricultural, environmental, geomorphological and/or geotechnical contexts, as relevant to the students enrolled.  
Includes: Experiential Learning Activity

**GEOG 5400 [0.5 credit]****Territory and Territoriality**

Contemporary geographical and international relations theorizing is challenging notions of boundaries and territories in the political organization of modernity. Using contemporary writings on geopolitics, security, sovereignty, self-determination and identity politics this course investigates territoriality as a political and intellectual strategy.  
Includes: Experiential Learning Activity  
Also listed as INAF 5402.

**GEOG 5406 [0.5 credit]****Special Topics in Cultural Geography**

Research seminar on a selected theme within cultural (including historical) geography. Topic varies from year to year. Consult departmental website for current details.  
Includes: Experiential Learning Activity

**GEOG 5500 [0.5 credit]****Special Topics in the Study of Cities and Urbanization**

Research seminar on a selected theme within geographical approaches to the study of cities and urbanization. Topics will vary from year to year. Consult departmental website for current details.  
Includes: Experiential Learning Activity

**GEOG 5502 [0.5 credit]****Special Topics in Geography of Globalization**

Research seminar on a selected theme within geographical aspects of globalization. Topic varies from year to year. Consult departmental website for current details.  
Includes: Experiential Learning Activity

**GEOG 5600 [0.5 credit]****Empire and Colonialism**

Theoretical approaches to empire and colonialism: postcolonial, feminist, Indigenous, anti-racist, queer, decolonizing, and political-economic approaches. Consideration of a range of sites of imperial and colonial formation, including land, territory, nature, the body, sexuality, gender, and race, as well as forms of resistance, resurgence, and decolonization.

Includes: Experiential Learning Activity

**GEOG 5701 [0.5 credit]****Topics in Northern Human Geography**

Political, social, economic, cultural, and environmental geographies of the Canadian North and/or circumpolar North. Topics may include climate change, resource development, politics and governance, knowledge and expertise, geopolitics, sovereignty, colonialism, Indigenous knowledge, Indigenous self-determination, conservation and wildlife, environmental politics.

Includes: Experiential Learning Activity

**GEOG 5803 [0.5 credit]****Seminar in Geomatics**

Current research issues in geomatics, including remote sensing, geographic information systems, geographic positioning, and cartography. Topics will focus on combined interests of enrolled students and departmental faculty.

Includes: Experiential Learning Activity

Prerequisite(s): prior experience with GIS, GPS, remote sensing or cartography and permission of the department.

**GEOG 5804 [0.5 credit]****Geographic Information Systems**

GIS for students with no previous experience. Includes data formats and structures, input/output and analysis capabilities, and GIS applications.

Includes: Experiential Learning Activity

**GEOG 5900 [0.5 credit]****Graduate Tutorial**

Tutorial, directed reading or research, offered on an individual basis, to meet specific program needs; may be taken in one of the areas of specialization of the Department.

Includes: Experiential Learning Activity

**GEOG 5905 [0.5 credit]****Masters Research Workshop**

A workshop which focuses on the challenges of research design in the various sub-fields of geography. The workshop will culminate with the development and defence of a thesis research proposal.

Includes: Experiential Learning Activity

**GEOG 5906 [3.0 credits]****M.Sc. Thesis**

Thesis supervision will be given in Physical Geography, as listed in the introductory section of this department's program description.

Includes: Experiential Learning Activity

**GEOG 5908 [1.0 credit]****M.A. Major Research Essay**

Supervised research essay offered on an individual basis, to meet M.A. Major Research Essay pathway program needs; may be taken in one of the areas of specialization of the Department.E.

Includes: Experiential Learning Activity

Prerequisite(s): Permission of the Department.

**GEOG 5909 [2.5 credits]****M.A. Thesis**

Thesis supervision will be given in all areas of specialization of the Department, as listed in the introductory section of this department's program description.

Includes: Experiential Learning Activity

**GEOG 6000 [0.5 credit]****Doctoral Core Seminar: Geography, Society and the Environment**

Examination of the production and use of geographical knowledge, including underlying philosophies, key theoretical concepts, and methodological approaches. Discussion and integrative approaches to understanding the geographies of environmental and social change. Provides an opportunity for students to locate their research interests within broader intellectual contexts.

Includes: Experiential Learning Activity

**GEOG 6001 [0.5 credit]****Doctoral Core Seminar: Research and Professional Practice**

Geographical research situated within broader disciplinary and institutional context. Exploration of various aspects of professional practice (academic and non-academic careers, pedagogical style, etc.). Research impact, knowledge mobilization, engaged scholarship. Early thesis proposal development.

Includes: Experiential Learning Activity

**GEOG 6003 [0.5 credit]****Field Seminar: Geography of Societal Change**

Analysis of current geographical and related research into the three themes of global political economy: restructuring and the environment; geographies of socio-cultural evaluation; and feminist geographies.

Includes: Experiential Learning Activity

**GEOG 6004 [0.5 credit]****Field Seminar: Geography of Societal Change**

Analysis of current geographical and related research into the three themes of global political economy: restructuring and the environment; geographies of socio-cultural evaluation; and feminist geographies.

Includes: Experiential Learning Activity

**GEOG 6006 [0.5 credit]****Field Seminar: Geography of Environmental Change**

Analysis of geographical and related research into the appraisal and societal management of environmental resources, and environmental processes and anthropogenic impacts.

Includes: Experiential Learning Activity

**GEOG 6007 [0.5 credit]****Field Seminar: Geography of Environmental Change**

Analysis of geographical and related research into the appraisal and societal management of environmental resources, and environmental processes and anthropogenic impacts.

Includes: Experiential Learning Activity

**GEOG 6906 [0.0 credit]****Comprehensive Examination: The Geography of Societal Change**

This examination focuses on research challenges in theory and methodology in the themes of global political economy: restructuring and the environment; geographies of socio-cultural evaluation; feminist geographies. A specific theme will be identified for each candidate.

Includes: Experiential Learning Activity

**GEOG 6907 [0.0 credit]****Comprehensive Examination: The Geography of Environmental Change**

This examination focuses on research challenges in theory and methodology associated with the appraisal and societal management of environmental resources, and environmental processes and anthropogenic impacts. A specific theme will be identified for each candidate.

Includes: Experiential Learning Activity

**GEOG 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Health Sciences

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This section presents the requirements for programs in:

- **M.Sc. Health Sciences**
- **M.Sc. Health Sciences with Collaborative Specialization in Accessibility**
- **M.Sc. Health Sciences with Collaborative Specialization in Data Science**
- **M.Sc. Health: Science, Technology and Policy**
- **M.Sc. Health: Science, Technology and Policy Advanced Completion Option**
- **M.Sc. Health: Science, Technology and Policy with Collaborative Specialization in Accessibility**
- **M.Sc. Clinical Trials and Regulatory Affairs**
- **Graduate Diploma in Health: Science, Technology and Policy**
- **Ph.D. Health Sciences**

**Program Requirements****M.Sc. Health Sciences (5.0 credits)****Requirements:**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences	
<b>2. 0.5 credit from:</b>		<b>0.5</b>
HLTH 5902 [0.5]	Seminars in Interdisciplinary Health Sciences for MSc	
or elective, approved by Thesis Supervisor and Graduate Advisor		
<b>3. 0.0 credit in:</b>		<b>0.0</b>
HLTH 5906 [0.0]	Research Seminar Presentation for MSc	
HLTH 5905 [0.0]	Final Research Seminar Presentation for MSc	
<b>4. 4.0 credits in:</b>		<b>4.0</b>
HLTH 5909 [4.0]	MSc Thesis	
<b>5. Twice-yearly meetings with the thesis Graduate Advisory Committee, with students meeting a level of progress as determined by the Committee.</b>		
<b>Total Credits</b>		<b>5.0</b>

**M.Sc. Health Sciences with Collaborative Specialization in Accessibility (6.0 credits)****Requirements:**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences	
<b>2. 0.5 credit from:</b>		<b>0.5</b>
HLTH 5902 [0.5]	Seminars in Interdisciplinary Health Sciences for MSc	
or elective, approved by Thesis Supervisor and Graduate Advisor		
<b>3. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>4. 0.0 credit in:</b>		<b>0.0</b>

HLTH 5906 [0.0]	Research Seminar Presentation for MSc	
HLTH 5905 [0.0]	Final Research Seminar Presentation for MSc	

**5. 4.0 credits in:** 4.0

HLTH 5909 [4.0]	MSc Thesis (in the specialization)	
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**6. Twice-yearly meetings with the thesis Graduate Advisory Committee, with students meeting a level of progress as determined by the Committee.**

**Total Credits** 6.0

### M.Sc. Health Sciences with Collaborative Specialization in Data Science (5.5 credits)

#### Requirements (5.5 credits):

**1. 0.5 credit in:** 0.5

HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences	
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**2. 0.5 credit from:** 0.5

HLTH 5902 [0.5]	Seminars in Interdisciplinary Health Sciences for MSc	
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or elective, approved by Thesis Supervisor and Graduate Advisor

**3. 0.5 credit in:** 0.5

DATA 5000 [0.5]	Introduction to Data Science	
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**4. 0.0 credit in:** 0.0

HLTH 5906 [0.0]	Research Seminar Presentation for MSc	
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HLTH 5905 [0.0]	Final Research Seminar Presentation for MSc	
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**5. 4.0 credits in:** 4.0

HLTH 5909 [4.0]	MSc Thesis (in the specialization)	
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**6. Twice-yearly meetings with the thesis Graduate Advisory Committee, with students meeting a level of progress as determined by the Committee.**

**Total Credits** 5.5

### M.Sc. Health: Science, Technology and Policy (6.0 credits)

#### Requirements:

**1. 3.0 credits in:** 3.5

HLTH 5100 [0.5]	Fundamentals of Research Methods	
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HLTH 5150 [0.5]	Statistics for Health Sciences	
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HLTH 5201 [0.5]	Fundamentals of Policy I: Policy Analysis	
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HLTH 5300 [0.5]	Knowledge Translation	
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HLTH 5350 [0.5]	New Health Technologies	
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HLTH 5402 [0.5]	Biological and Social Fundamentals of Health	
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**2. 0.5 credit in:**

HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences	
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**3. 1.0 credit from:** 1.0

#### a) Research project pathway

HLTH 5507 [1.0]	Interdisciplinary Health Research Project	
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#### b) Practicum pathway

HLTH 5506 [1.0]	Field Research and Placement	
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**4. 1.5 credits from:** 1.5

a. HLTH selected topic elective courses focusing on areas of specific relevance to the health sector

HLTH 5151 [0.5]	Principles of Epidemiology	
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HLTH 5202 [0.5]	Fundamentals of Policy II: The Health Sector	
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HLTH 5403 [0.5]	Host-Pathogen Interactions	
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HLTH 5600 [0.25]	Special Topics in Biostatistics and Epidemiology	
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HLTH 5601 [0.25]	Special Topics in Health Policy and Administration	
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HLTH 5602 [0.25]	Special Topics: Social and Behavioural	
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HLTH 5603 [0.25]	Special Topics in Environmental Health	
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HLTH 5604 [0.25]	Special Topics in the Science of Disease	
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HLTH 5605 [0.25]	Special Topics: Engineering, Design and Computer Science	
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HLTH 5701 [0.5]	Special Topics in Health Policy and Administration	
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HLTH 5702 [0.5]	Special Topics: Social and Behavioural	
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HLTH 5703 [0.5]	Special Topics in Environmental Health	
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HLTH 5704 [0.5]	Special Topics in the Science of Disease	
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HLTH 5705 [0.5]	Special Topics: Engineering, Design and Computer Science	
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HLTH 5800 [0.5]	Directed Studies in Health: Science, Technology and Policy	
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HLTH 5801 [0.5]	Health: Science, Technology and Policy Practicum	
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b. Courses offered by other graduate programs, selected with the guidance and permission of the supervisor of graduate studies and with the permission of the specific program and requiring the prior completion of prerequisites. Examples include:

BIOL 5407 [0.5]	Biostatistics I	
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BIOL 5515 [0.5]	Bioinformatics	
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BIOL 5516 [0.5]	Applied Bioinformatics	
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BIOL 6406 [0.5]	Genetic Toxicology	
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BIOM 5100 [0.5]	Biomedical Instrumentation	
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CHEM 5708 [0.5]	Principles of Toxicology	
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CHEM 5709 [0.5]	Chemical Toxicology	
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COMS 5206 [0.5]	Communication, Culture, Regulation	
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COMP 5308 [0.5]	Topics in Medical Computing	
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INAF 5705 [0.5]	Global Social Policy	
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INAF 5706 [0.5]	Global Health Policy	
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NEUR 5201 [0.5]	Foundations in Statistics for Neuroscience	
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PADM 5221 [0.5]	Health Policy in Canada	
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PADM 5222 [0.5]	Economics and Health Policy	
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PADM 5229 [0.5]	The Health of Populations	
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PADM 5817 [0.5]	Health Policy in Developing Countries	
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PHIL 5000 [0.5]	Special Topic in Philosophy	
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PHYS 5204 [0.5]	Physics of Medical Imaging	
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PSYC 5209 [0.5]	Topics in Health Psychology	
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SOCI 5209 [0.5]	Sociology of Science and Technology
SOWK 5302 [0.5]	Mental Health
STAT 5600 [0.5]	Mathematical Statistics I
STAT 5501 [0.5]	Mathematical Statistics II
STAT 5602 [0.5]	Analysis of Categorical Data

**Total Credits** **6.0**

### **M.Sc. Health: Science, Technology and Policy Advanced Completion Option (5.0 credits)**

Applicants with at least three years of demonstrated, relevant work experience in their health-related professional field may qualify for admission to the Advanced Completion Option. The Advanced Completion Option exempts students from the 1.0 credit practicum. Up to 0.5 credit of additional advanced standing may also be available based on the applicant's portfolio, to be determined on an individual basis by the department.

#### **Requirements:**

#### **1. 3.0 credits in:** **3.0**

HLTH 5100 [0.5]	Fundamentals of Research Methods
HLTH 5150 [0.5]	Statistics for Health Sciences
HLTH 5201 [0.5]	Fundamentals of Policy I: Policy Analysis
HLTH 5300 [0.5]	Knowledge Translation
HLTH 5350 [0.5]	New Health Technologies
HLTH 5401 [0.5]	Interdisciplinary Problems in Health

#### **2. 0.5 credit in:** **0.5**

HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences
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#### **3. 1.5 credits from:** **1.5**

a. HLTH selected topic elective courses focusing on areas of specific relevance to the health sector

HLTH 5151 [0.5]	Principles of Epidemiology
HLTH 5202 [0.5]	Fundamentals of Policy II: The Health Sector
HLTH 5403 [0.5]	Host-Pathogen Interactions
HLTH 5600 [0.25]	Special Topics in Biostatistics and Epidemiology
HLTH 5601 [0.25]	Special Topics in Health Policy and Administration
HLTH 5602 [0.25]	Special Topics: Social and Behavioural
HLTH 5603 [0.25]	Special Topics in Environmental Health
HLTH 5604 [0.25]	Special Topics in the Science of Disease
HLTH 5605 [0.25]	Special Topics: Engineering, Design and Computer Science
HLTH 5701 [0.5]	Special Topics in Health Policy and Administration
HLTH 5702 [0.5]	Special Topics: Social and Behavioural
HLTH 5703 [0.5]	Special Topics in Environmental Health
HLTH 5704 [0.5]	Special Topics in the Science of Disease
HLTH 5705 [0.5]	Special Topics: Engineering, Design and Computer Science

HLTH 5800 [0.5]	Directed Studies in Health: Science, Technology and Policy
HLTH 5801 [0.5]	Health: Science, Technology and Policy Practicum

b. Courses offered by other graduate programs, selected with the guidance and permission of the supervisor of graduate studies and with permission of the specific program and requiring the prior completion of prerequisites. Examples include:

BIOL 5407 [0.5]	Biostatistics I
BIOL 5515 [0.5]	Bioinformatics
BIOL 5516 [0.5]	Applied Bioinformatics
BIOL 6406 [0.5]	Genetic Toxicology
BIOM 5100 [0.5]	Biomedical Instrumentation
CHEM 5708 [0.5]	Principles of Toxicology
CHEM 5709 [0.5]	Chemical Toxicology
COMS 5206 [0.5]	Communication, Culture, Regulation
COMP 5308 [0.5]	Topics in Medical Computing
INAF 5705 [0.5]	Global Social Policy
INAF 5706 [0.5]	Global Health Policy
NEUR 5201 [0.5]	Foundations in Statistics for Neuroscience
PADM 5221 [0.5]	Health Policy in Canada
PADM 5222 [0.5]	Economics and Health Policy
PADM 5229 [0.5]	The Health of Populations
PADM 5817 [0.5]	Health Policy in Developing Countries
PHIL 5000 [0.5]	Special Topic in Philosophy
PHYS 5204 [0.5]	Physics of Medical Imaging
PSYC 5209 [0.5]	Topics in Health Psychology
SOCI 5209 [0.5]	Sociology of Science and Technology
SOWK 5302 [0.5]	Mental Health
STAT 5501 [0.5]	Mathematical Statistics II
STAT 5600 [0.5]	Mathematical Statistics I
STAT 5602 [0.5]	Analysis of Categorical Data

**Total Credits** **5.0**

### **M.Sc. Health: Science, Technology and Policy with Collaborative Specialization in Accessibility (6.0 credits)**

#### **Requirements:**

#### **1. 1.0 credit in:** **1.0**

ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar

#### **2. 3.0 credits in:** **3.0**

HLTH 5100 [0.5]	Fundamentals of Research Methods
HLTH 5150 [0.5]	Statistics for Health Sciences
HLTH 5201 [0.5]	Fundamentals of Policy I: Policy Analysis
HLTH 5300 [0.5]	Knowledge Translation
HLTH 5350 [0.5]	New Health Technologies
HLTH 5402 [0.5]	Biological and Social Fundamentals of Health

#### **3. 0.5 credit in:** **0.5**

HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences	
<b>4. 1.0 credit from:</b>		<b>1.0</b>
HLTH 5507 [1.0]	Interdisciplinary Health Research Project (in the specialization)	
<b>5. 0.5 credit from:</b>		<b>0.5</b>
a. HLTH selected topic elective courses focusing on areas of specific relevance to the health sector		
HLTH 5151 [0.5]	Principles of Epidemiology	
HLTH 5202 [0.5]	Fundamentals of Policy II: The Health Sector	
HLTH 5403 [0.5]	Host-Pathogen Interactions	
HLTH 5600 [0.25]	Special Topics in Biostatistics and Epidemiology	
HLTH 5601 [0.25]	Special Topics in Health Policy and Administration	
HLTH 5602 [0.25]	Special Topics: Social and Behavioural	
HLTH 5603 [0.25]	Special Topics in Environmental Health	
HLTH 5604 [0.25]	Special Topics in the Science of Disease	
HLTH 5605 [0.25]	Special Topics: Engineering, Design and Computer Science	
HLTH 5701 [0.5]	Special Topics in Health Policy and Administration	
HLTH 5702 [0.5]	Special Topics: Social and Behavioural	
HLTH 5703 [0.5]	Special Topics in Environmental Health	
HLTH 5704 [0.5]	Special Topics in the Science of Disease	
HLTH 5705 [0.5]	Special Topics: Engineering, Design and Computer Science	
HLTH 5800 [0.5]	Directed Studies in Health: Science, Technology and Policy	
HLTH 5801 [0.5]	Health: Science, Technology and Policy Practicum	
b. Courses offered by other graduate programs, selected with the guidance and permission of the supervisor of graduate studies and with the permission of the specific program and requiring the prior completion of prerequisites. Examples include:		
BIOL 5407 [0.5]	Biostatistics I	
BIOL 5515 [0.5]	Bioinformatics	
BIOL 5516 [0.5]	Applied Bioinformatics	
BIOL 6406 [0.5]	Genetic Toxicology	
BIOM 5100 [0.5]	Biomedical Instrumentation	
CHEM 5708 [0.5]	Principles of Toxicology	
CHEM 5709 [0.5]	Chemical Toxicology	
COMS 5206 [0.5]	Communication, Culture, Regulation	
COMP 5308 [0.5]	Topics in Medical Computing	
INAF 5705 [0.5]	Global Social Policy	
INAF 5706 [0.5]	Global Health Policy	
NEUR 5201 [0.5]	Foundations in Statistics for Neuroscience	
PADM 5221 [0.5]	Health Policy in Canada	
PADM 5222 [0.5]	Economics and Health Policy	
PADM 5229 [0.5]	The Health of Populations	

PADM 5817 [0.5]	Health Policy in Developing Countries	
PHIL 5000 [0.5]	Special Topic in Philosophy	
PHYS 5204 [0.5]	Physics of Medical Imaging	
PSYC 5209 [0.5]	Topics in Health Psychology	
SOCI 5209 [0.5]	Sociology of Science and Technology	
SOWK 5302 [0.5]	Mental Health	
STAT 5600 [0.5]	Mathematical Statistics I	
STAT 5501 [0.5]	Mathematical Statistics II	
STAT 5602 [0.5]	Analysis of Categorical Data	
<b>Total Credits</b>		<b>6.0</b>

## M.Sc. Clinical Trials and Regulatory Affairs (4.5 credits)

### Requirements:

<b>1. 0.0 credit in:</b>		
HLTH 5101 [0.0]	Statistical Software and its Application to Health Sciences Primer (must be completed within two weeks of first semester)	
HLTH 5811 [0.0]	Clinical Trials Primer (must be completed within two weeks of first semester)	
<b>2. 4.0 credits in:</b>		<b>4.0</b>
HLTH 5812 [0.5]	Clinical Trials 1: Introduction	
HLTH 5813 [0.5]	Clinical Trials 2	
HLTH 5814 [0.5]	Assessment and Patient Safety for Clinical Trials	
HLTH 5815 [0.5]	Principles of Data Management and Analysis in Clinical Trials	
HLTH 5816 [0.5]	Government Regulatory Processes	
HLTH 5817 [0.5]	Government, Research Organizations, and Industry	
HLTH 5818 [0.5]	Ethics, Community and Patient Engagement	
HLTH 5819 [0.5]	Clinical Trials Protocols, Operations and Management	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
BIOC 4708 [0.5]	Principles of Toxicology	
CHEM 4305 [0.5]	Environmental Chemistry and Toxicology	
HLTH 5150 [0.5]	Statistics for Health Sciences	
HLTH 5151 [0.5]	Principles of Epidemiology	
HLTH 5350 [0.5]	New Health Technologies	
HLTH 5700 [0.5]	Special Topics in Biostatistics and Epidemiology	
HLTH 5704 [0.5]	Special Topics in the Science of Disease	
HLTH 5821 [0.5]	Effective Communication in Clinical Research and Regulatory Environments	
STAT 5602 [0.5]	Analysis of Categorical Data	
STAT 5603 [0.5]	Reliability and Survival Analysis	
<b>Total Credits</b>		<b>4.5</b>

## M.Sc. Clinical Trials and Regulatory Affairs (practicum pathway - 6.0 credits)

### Requirements:

#### 1. 0.0 credit in:

HLTH 5101 [0.0]	Statistical Software and its Application to Health Sciences Primer (must be completed within two weeks of first semester)
HLTH 5811 [0.0]	Clinical Trials Primer (must be completed within two weeks of first semester)

#### 2. 4.0 credits in: 4.0

HLTH 5812 [0.5]	Clinical Trials 1: Introduction
HLTH 5813 [0.5]	Clinical Trials 2
HLTH 5814 [0.5]	Assessment and Patient Safety for Clinical Trials
HLTH 5815 [0.5]	Principles of Data Management and Analysis in Clinical Trials
HLTH 5816 [0.5]	Government Regulatory Processes
HLTH 5817 [0.5]	Government, Research Organizations, and Industry
HLTH 5818 [0.5]	Ethics, Community and Patient Engagement
HLTH 5819 [0.5]	Clinical Trials Protocols, Operations and Management

#### 3. 0.5 credit from: 0.5

BIOC 4708 [0.5]	Principles of Toxicology
CHEM 4305 [0.5]	Environmental Chemistry and Toxicology
HLTH 5150 [0.5]	Statistics for Health Sciences
HLTH 5151 [0.5]	Principles of Epidemiology
HLTH 5350 [0.5]	New Health Technologies
HLTH 5700 [0.5]	Special Topics in Biostatistics and Epidemiology
HLTH 5704 [0.5]	Special Topics in the Science of Disease
HLTH 5821 [0.5]	Effective Communication in Clinical Research and Regulatory Environments
STAT 5602 [0.5]	Analysis of Categorical Data
STAT 5603 [0.5]	Reliability and Survival Analysis

#### 4. 1.5 credits in: 1.5

HLTH 5820 [1.5]	Clinical Trials Practicum
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#### Total Credits 6.0

## Graduate Diploma in Health: Science, Technology and Policy (2.0 credits)

### Requirements:

#### 1. 1.5 credits in: 1.5

HLTH 5100 [0.5]	Fundamentals of Research Methods
HLTH 5201 [0.5]	Fundamentals of Policy I: Policy Analysis
HLTH 5300 [0.5]	Knowledge Translation

#### 2. 0.5 credit in electives from either a or b: 0.5

a. HLTH selected topic elective courses focusing on areas of specific relevance to the health sector:	
HLTH 5150 [0.5]	Statistics for Health Sciences

HLTH 5151 [0.5]	Principles of Epidemiology
HLTH 5202 [0.5]	Fundamentals of Policy II: The Health Sector
HLTH 5350 [0.5]	New Health Technologies
HLTH 5401 [0.5]	Interdisciplinary Problems in Health
HLTH 5402 [0.5]	Biological and Social Fundamentals of Health
HLTH 5600 [0.25]	Special Topics in Biostatistics and Epidemiology
HLTH 5601 [0.25]	Special Topics in Health Policy and Administration
HLTH 5602 [0.25]	Special Topics: Social and Behavioural
HLTH 5603 [0.25]	Special Topics in Environmental Health
HLTH 5604 [0.25]	Special Topics in the Science of Disease
HLTH 5605 [0.25]	Special Topics: Engineering, Design and Computer Science
HLTH 5700 [0.5]	Special Topics in Biostatistics and Epidemiology
HLTH 5701 [0.5]	Special Topics in Health Policy and Administration
HLTH 5702 [0.5]	Special Topics: Social and Behavioural
HLTH 5703 [0.5]	Special Topics in Environmental Health
HLTH 5704 [0.5]	Special Topics in the Science of Disease
HLTH 5705 [0.5]	Special Topics: Engineering, Design and Computer Science

b. Courses offered by other graduate programs, selected with the guidance and permission of the supervisor of graduate studies and with the permission of the specific program and requiring the prior completion of prerequisites.

#### Total Credits 2.0

### Type 3 Diploma

For individuals currently employed, or with the goal of employment in the health sector, who are not currently registered in another Carleton graduate program.

### Requirements:

#### 1. 0.5 credit in: 0.5

HLTH 5300 [0.5]	Knowledge Translation
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#### 2. 1.5 credits in electives from either a, b or c: 1.5

a. HLTH 5201 (recommended for students who do not have a strong policy background)

b. HLTH selected topic elective courses focusing on areas of specific relevance to the health sector:

HLTH 5100 [0.5]	Fundamentals of Research Methods
HLTH 5150 [0.5]	Statistics for Health Sciences
HLTH 5151 [0.5]	Principles of Epidemiology
HLTH 5202 [0.5]	Fundamentals of Policy II: The Health Sector
HLTH 5350 [0.5]	New Health Technologies
HLTH 5401 [0.5]	Interdisciplinary Problems in Health
HLTH 5402 [0.5]	Biological and Social Fundamentals of Health

HLTH 5600 [0.25]	Special Topics in Biostatistics and Epidemiology
HLTH 5601 [0.25]	Special Topics in Health Policy and Administration
HLTH 5602 [0.25]	Special Topics: Social and Behavioural
HLTH 5603 [0.25]	Special Topics in Environmental Health
HLTH 5604 [0.25]	Special Topics in the Science of Disease
HLTH 5605 [0.25]	Special Topics: Engineering, Design and Computer Science
HLTH 5700 [0.5]	Special Topics in Biostatistics and Epidemiology
HLTH 5701 [0.5]	Special Topics in Health Policy and Administration
HLTH 5702 [0.5]	Special Topics: Social and Behavioural
HLTH 5703 [0.5]	Special Topics in Environmental Health
HLTH 5704 [0.5]	Special Topics in the Science of Disease
HLTH 5705 [0.5]	Special Topics: Engineering, Design and Computer Science
c. Courses offered by other graduate programs, selected with the guidance and permission of the supervisor of graduate studies and with the permission of the specific program and requiring the prior completion of prerequisites. No more than 0.5 credit can be taken outside of the department.	

**Total Credits** **2.0**

## Ph.D. Health Sciences (1.5 credits)

### Requirements:

<b>1. 0.5 credit from:</b>	<b>0.5</b>
HLTH 5901 [0.5]	Advanced Topics in Interdisciplinary Health Sciences
HLTH 5903 [0.5]	Current Topics in Interdisciplinary Health Sciences
<b>2. 0.5 credit from:</b>	<b>0.5</b>
HLTH 6902 [0.5]	Seminars in Interdisciplinary Health Sciences
or elective, approved by Faculty Supervisor and Graduate Advisor	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
HLTH 6903 [0.5]	Grant Proposals and Ethics
<b>4. Completion of:</b>	<b>0.0</b>
HLTH 6906 [0.0]	Research Seminar Presentation for PhD
HLTH 6904 [0.0]	Mid-Program Defence
HLTH 6905 [0.0]	Final Research Seminar Presentation
<b>5. 0.0 credit in:</b>	<b>0.0</b>
HLTH 6909 [0.0]	PhD Thesis
<b>6. Twice-yearly meetings with thesis Graduate Advisory Committee, with students reaching a level of satisfaction as determined by the Committee</b>	

**Total Credits** **1.5**

### Regulations

See the General Regulations section of this Calendar.

All candidates are required to obtain a grade of B or higher in each course in the program.

### M.Sc. Health: Science, Technology and Policy

Full-time candidates in the master's program are expected to complete their degree requirements within five terms (20 months) of first registration for full-time study.

### Regulations

See the General Regulations section of this Calendar.

All candidates are required to obtain a grade of B or higher in each course in the program.

### Regulations

See the General Regulations section of this Calendar.

All candidates are required to obtain a grade of B- or higher in each course in the program.

### Admission

Applicants for the master's program will normally hold an Honours undergraduate degree or equivalent professional degree. Normally, an average of B+ or higher is required for admission. At least one university-level course in statistics is also required for admission. Applicants judged to be generally acceptable but deficient in some aspect of preparation may be asked to complete course-work in addition to the program requirements. In addition to transcripts and letters of reference, application packages will include a statement of interest explaining how the applicant's career goals are aligned with the program and a statement of expertise, including previous research and/or work experience. The admissions committee will also consider the requirement for an appropriate balance of academic backgrounds to provide the disciplinary expertise required for the group projects, which are designed to represent a mixed-discipline workplace in the health sector.

Students whose first language is not English, or who have not completed a previous degree at an English speaking university, must demonstrate an adequate command of English. Please refer to section 3.6 of the general regulations in the Graduate Calendar.

Students may receive advanced standing with transfer of credit for up to 1.5 credits. Advanced standing will be considered only for core courses. It will be determined on an individual basis in consultation with the M.Sc Supervisor and Graduate Studies and pursuant to Section 6.1 of the General Regulations section of this Calendar. In general, a grade of B+ or higher is necessary in the equivalent courses in order to receive advanced standing.

**Note:** students in the Diploma programs are not eligible to receive university funding.

### Admission

The normal requirement for admission into the Ph.D. program is an M.Sc. degree in a relevant field. Students who are in the Health Sciences M.Sc. program may be admitted to the Ph.D. program if they show outstanding academic performance and demonstrate significant promise for advanced research, upon recommendation of

the student's Graduate Advisory Committee and approval by the Graduate Advisor.

### **Admission**

Applicants must have a bachelor's degree (or equivalent). Normally, an average of B+ or higher is required for admission. A university level course in statistics is also required for admission.

Students whose first language is not English, or who have not completed a previous degree at an English speaking university, must demonstrate an adequate command of English. Please refer to section 3.6 of the general regulations in the Graduate Calendar.

Note: students in the Diploma programs are not eligible to receive university funding through the program.

### **Health Sciences (HLTH) Courses**

#### **HLTH 5100 [0.5 credit]**

##### **Fundamentals of Research Methods**

Experimental design, statistical analysis and interpretation of results in health science research, principles and methods of epidemiology, fundamentals of research ethics.

Includes: Experiential Learning Activity

Prerequisite(s): university-level statistics.

#### **HLTH 5101 [0.0 credit]**

##### **Statistical Software and its Application to Health Sciences Primer**

Introduction to statistical softwares used to analyze health research data. Data management topics include data entry, manipulation, and elementary statistical analyses using SAS, SPSS, Stata and R. Other topics include privacy/maintaining security of health datasets. For students without strong backgrounds in biostatistics/data handling.

Includes: Experiential Learning Activity

#### **HLTH 5150 [0.5 credit]**

##### **Statistics for Health Sciences**

Statistical methods commonly used in analyses of health data. This applied course covers topics related to descriptive and graphical methods, tests of hypotheses in both paired and independent samples, linear regression, survival analysis, and logistic regression.

Includes: Experiential Learning Activity

Lecture three hours a week, lab/workshop three hours a week.

#### **HLTH 5151 [0.5 credit]**

##### **Principles of Epidemiology**

Introduction to epidemiologic concepts and methods. Different types of epidemiological study designs.

Fundamental concepts of: definitions and measures of disease frequency and effects, causality, bias, sample size, confounding and interaction.

Includes: Experiential Learning Activity

#### **HLTH 5201 [0.5 credit]**

##### **Fundamentals of Policy I: Policy Analysis**

Policy analysis and policy processes with an emphasis on the stages of the policy process, as well as the influences of institutions, ideas and interests.

#### **HLTH 5202 [0.5 credit]**

##### **Fundamentals of Policy II: The Health Sector**

Canadian health policies and programs with emphasis on the economics, politics and public administration of the healthcare sector.

#### **HLTH 5300 [0.5 credit]**

##### **Knowledge Translation**

The application of knowledge translation in the formulation of policy and the development of skills required to maximize the impact of scientific findings through real world programs and policies and communication skills for diverse audiences.

Precludes additional credit for NEUR 5801.

Also offered at the undergraduate level, with different requirements, as HLTH 4701, for which additional credit is precluded.

#### **HLTH 5350 [0.5 credit]**

##### **New Health Technologies**

Overview of new and emerging health technologies, including medical and assistive devices, diagnostics and screening, genetics, reproduction, tissue regeneration, imaging, and health informatics. Health technology assessment methods and issues. Regulatory, ethical and social implications; considerations in the developing world.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as HLTH 4102, for which additional credit is precluded.

#### **HLTH 5401 [0.5 credit]**

##### **Interdisciplinary Problems in Health**

Development of an understanding of the scope and interdisciplinary nature of issues that impact the health of Canadians is the focus of this course.

Precludes additional credit for HLTH 5903.

#### **HLTH 5402 [0.5 credit]**

##### **Biological and Social Fundamentals of Health**

What comprises a healthy body and mind? This course addresses the psycho-social and biological mechanisms that may interact to determine health outcomes. The course examines complex relationships between social, environmental, and biological factors underlying some of the most important and emerging health concerns today.

**HLTH 5403 [0.5 credit]****Host-Pathogen Interactions**

Advanced cellular and molecular mechanisms governing host-pathogen interactions and their contribution to disease. Exploration of immune signaling and recognition, virulence factors, antimicrobial resistance and research techniques used in this field.

Prerequisite(s): Permission of the department.

Also offered at the undergraduate level, with different requirements, as HLTH 4304, for which additional credit is precluded.

**HLTH 5504 [1.0 credit]****Interdisciplinary Health Research Project - Group**

Student teams will collaborate on a research project that addresses a real-world health concern, supervised by a cross-disciplinary team of faculty. Students must be continually registered in this course throughout their degree program (five terms.).

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5502 (no longer offered), HLTH 5503(no longer offered), HLTH 5505.

**HLTH 5505 [1.0 credit]****Interdisciplinary Health Research Project – Individual**

An independent research project that addresses a real-world health concern, supervised by a faculty member and advised by a cross-disciplinary team of experts. Students must be continually registered in this course throughout their degree program (five terms).

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5502(no longer offered), HLTH 5503(longer offered), HLTH 5504.

Prerequisite(s): permission of the Faculty supervisor and the Department of Health Sciences.

**HLTH 5506 [1.0 credit]****Field Research and Placement**

This practicum supports students in gaining relevant and practical experience through applying course learning at approved organizations.

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5801.

Prerequisite(s): Completion of two terms of the MSc HSTP program, permission of the department and at the discretion of the practicum supervisor.

Schedules may vary depending on the field placement site, but students are required to spend a minimum of 32 weeks over summer, fall and winter in the second year.

**HLTH 5507 [1.0 credit]****Interdisciplinary Health Research Project**

Research project that addresses a real-world health concern, supervised by a faculty member and advised by a cross-disciplinary team of experts. Students must be continually registered in this course throughout their degree program (five terms).

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5504, HLTH 5505.

Prerequisite(s): Permission of the Faculty supervisor and the Department of Health Sciences.

**HLTH 5600 [0.25 credit]****Special Topics in Biostatistics and Epidemiology**

Selected topics in biostatistics and epidemiology, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

Includes: Experiential Learning Activity

**HLTH 5601 [0.25 credit]****Special Topics in Health Policy and Administration**

Selected topics in health policy and administration, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5602 [0.25 credit]****Special Topics: Social and Behavioural**

Selected topics in the social and behavioural sciences, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5603 [0.25 credit]****Special Topics in Environmental Health**

Selected topics in environmental health, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5604 [0.25 credit]****Special Topics in the Science of Disease**

Selected topics in the science of disease, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5605 [0.25 credit]****Special Topics: Engineering, Design and Computer Science**

Selected topics in applications of engineering, design or computer science in health, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5700 [0.5 credit]****Special Topics in Biostatistics and Epidemiology**

Selected topics in biostatistics and epidemiology, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

Includes: Experiential Learning Activity

**HLTH 5701 [0.5 credit]****Special Topics in Health Policy and Administration**

Selected topics in health policy and administration, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5702 [0.5 credit]****Special Topics: Social and Behavioural**

Selected topics in the social and behavioural sciences, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5703 [0.5 credit]****Special Topics in Environmental Health**

Selected topics in environmental health, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5704 [0.5 credit]****Special Topics in the Science of Disease**

Selected topics in the science of disease, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5705 [0.5 credit]****Special Topics: Engineering, Design and Computer Science**

Selected topics in applications of engineering, design or computer science in health, focusing on areas of specific relevance to the health sector, not available in regular program offerings. These courses are designed to provide depth of expertise and/or specific skills relevant to the workplace.

**HLTH 5800 [0.5 credit]****Directed Studies in Health: Science, Technology and Policy**

Individualized instruction in selected aspects of specialized Health Sciences subjects not covered by other graduate courses. Students are permitted to only take this course once per program. Their project supervisor(s) may supervise if the research to be conducted is different from their thesis/project research.

Prerequisite(s): permission of the department.

**HLTH 5801 [0.5 credit]****Health: Science, Technology and Policy Practicum**

This practicum supports students in gaining relevant and practical experience through applying course learning at approved organizations. Students are responsible for arranging the placement with an external partner where the practicum will be held, preparing a learning contract, and completing a field-based project deliverable.

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5506.

Prerequisite(s): Completion of two semesters of the MSc in HSTP program, permission of the department and at the discretion of the practicum supervisor. Students may not be supervised by their MSc research supervisor(s) and are limited to one practicum per program.

**HLTH 5811 [0.0 credit]****Clinical Trials Primer**

Overview of the vast area of clinical trials of drugs and devices, and principles of informed consent, regulatory requirements, rigorous documentation, analysis, and reporting. Students will also work on certificates in biomedical ethics, good clinical practice, and others, for example from CITI Canada.

**HLTH 5812 [0.5 credit]****Clinical Trials 1: Introduction**

Fundamentals of trials of health products and different phases and types of clinical trials. Investigator vs. sponsor-initiated trials, different regulatory agencies, the use of randomization, blinding, registration regulatory requirements, rigorous documentation, and common trials.

**HLTH 5813 [0.5 credit]****Clinical Trials 2**

Other trial designs, recruitment of patients, data collection and quality control, interim monitoring, audits, inspections, timelines.

**HLTH 5814 [0.5 credit]****Assessment and Patient Safety for Clinical Trials**

The importance of efficacy and safety measurements, biosamples, pharmacokinetics, pharmacodynamics, drug mechanism of action, reporting of harm, Data and Safety Monitoring Board, pharmacovigilance, consideration of special populations. Good clinical practice, good medical practice, and good laboratory practice.

Includes: Experiential Learning Activity

**HLTH 5815 [0.5 credit]****Principles of Data Management and Analysis in Clinical Trials**

Randomization, biomarkers, endpoints, estimands, sample size requirements, random error and bias, multiple testing correction, intent-to-treat versus per-protocol, equipoise and stopping rules for trials, database development, validation and reporting/transferring, development of statistical analysis plans, considerations around missing data.

**HLTH 5816 [0.5 credit]****Government Regulatory Processes**

Regulatory agencies (Health Canada, US Food and Drug Administration, European Medicines Agency) will be compared. Harmonization efforts of national drug approval agencies, timelines for an investigational New Drug Application including labeling, accelerated approval, breakthrough designation, orphan drugs, and biologics licence application.

**HLTH 5817 [0.5 credit]****Government, Research Organizations, and Industry**

Overview of regulatory requirements of pharmaceutical companies, contracting research organizations, and communication with regulatory agencies. Negotiation and collaboration between sectors, incentives such as FDA priority review vouchers, project management, manufacturing and distribution, phase IV post-marketing and continued monitoring, pharmacovigilance and post-marketing changes.

**HLTH 5818 [0.5 credit]****Ethics, Community and Patient Engagement**

Patient engagement, equipoise, informed consent, ethics board, monitoring, reporting/release of data in the literature, compassionate/expanded access; patient foundations, liaisons and advocates. Engaging with Indigenous communities and special populations. Considerations around translational research, generics, biosimilars, and labeling.

**HLTH 5819 [0.5 credit]****Clinical Trials Protocols, Operations and Management**

Clinical protocols, electronic case report forms and guidelines, data management plan, monitoring plan, pharmacy manual, standard operating procedures, manual of operating procedures, delegation of authority logs and training logs. Leadership, logistics, budgeting.

**HLTH 5820 [1.5 credit]****Clinical Trials Practicum**

Capstone credit course required for students in the practicum pathway. Experiential learning at a clinical site, regulatory site, CRO, or similar institution involved in clinical trials. Students will demonstrate the knowledge and skills gained and will present on their experience, efforts and lessons learned.

Includes: Experiential Learning Activity

**HLTH 5821 [0.5 credit]****Effective Communication in Clinical Research and Regulatory Environments**

This course equips students with the skills to convey complex information in decision-based discussions and explain complex regulatory environments, preparing them for impactful roles in clinical trial research.

**HLTH 5901 [0.5 credit]****Advanced Topics in Interdisciplinary Health Sciences**

Discussion of current health problems and exploration of innovative interdisciplinary solutions. Development of skills required to perform critical analyses of health research to evaluate the quality, interpret the findings, and assess the impact of health sciences literature across disciplines. Precludes additional credit for HLTH 5903.

**HLTH 5902 [0.5 credit]****Seminars in Interdisciplinary Health Sciences for MSc**

Development of scientific communication skills through attendance at interdisciplinary seminars. Topics have specific or broad relevance to health sciences. Graded SAT/UNS.

**HLTH 5903 [0.5 credit]****Current Topics in Interdisciplinary Health Sciences**

Exploration of current health challenges and opportunities, and the role of interdisciplinary approaches to understand health and disease. Development of skills required for communication, collaboration, literature appraisal. Includes student, faculty, and invited seminar speakers.

Precludes additional credit for HLTH 5401, HLTH 5901.

Prerequisite(s): Permission of the Department of Health Sciences.

**HLTH 5905 [0.0 credit]****Final Research Seminar Presentation for MSc**

Final seminar of MSc thesis research. Seminar presentation should occur within one month of the final oral thesis defence.

Includes: Experiential Learning Activity

**HLTH 5906 [0.0 credit]****Research Seminar Presentation for MSc**

Seminar of MSc thesis research. Seminar presentation should occur after two terms in the MSc, and prior to enrolment in the second year.

Prerequisite(s): permission of the department.

**HLTH 5909 [4.0 credits]****MSc Thesis**

Includes: Experiential Learning Activity

**HLTH 6902 [0.5 credit]****Seminars in Interdisciplinary Health Sciences**

Development of scientific communication skills through attendance at interdisciplinary seminars. Topics have specific or broad relevance to health sciences. Graded SAT/UNS.

**HLTH 6903 [0.5 credit]****Grant Proposals and Ethics**

Advanced course in writing successful grant proposals in Tri-Council (CIHR, NSERC, SSHRC) formats. Ethics associated with conducting health sciences research, including the preparation of ethics proposals for human and animal studies in health sciences research.

Includes: Experiential Learning Activity

**HLTH 6904 [0.0 credit]****Mid-Program Defence**

Departmental seminar and Graduate Advisory Committee meeting on PhD research including results to date and future research aims and directions, and on field-specific knowledge.

Includes: Experiential Learning Activity

**HLTH 6905 [0.0 credit]****Final Research Seminar Presentation**

Final seminar of PhD thesis research. Seminar presentation should occur within one month of the final oral thesis defence.

Includes: Experiential Learning Activity

**HLTH 6906 [0.0 credit]****Research Seminar Presentation for PhD**

Seminar of PhD thesis research. Seminar presentation should occur after two terms in the PhD in Health Sciences, and prior to enrolment in the second year.

Prerequisite(s): Permission of the department.

**HLTH 6909 [0.0 credit]****PhD Thesis**

Includes: Experiential Learning Activity

## History

This section presents the requirements for programs in:

- **M.A. History**
- **M.A. History with Collaborative Specialization in Accessibility**
- **M.A. History with Collaborative Specialization in African Studies**
- **M.A. History with Collaborative Specialization in Climate Change**
- **M.A. History with Collaborative Specialization in Data Science**
- **M.A. History with Collaborative Specialization in Digital Humanities**
- **M.A. History with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. Public History**
- **M.A. Public History with Collaborative Specialization in Digital Humanities**
- **Ph.D. History**
- **Ph.D. History with Concentration in Public History**
- **Ph.D. History with Collaborative Specialization in Political Economy**

### Program Requirements

#### M.A. History (4.0 credits)

##### Requirements - Thesis pathway:

<b>1. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>2. 1.5 credits in HIST</b> at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.5
<b>3. 2.0 credits in:</b>	2.0
HIST 5909 [2.0]	M.A. Thesis
<b>Total Credits</b>	<b>4.0</b>

##### Requirements - Research Essay pathway:

<b>1. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>2. 2.0 credits in HIST</b> at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	2.0
<b>3. 0.5 credit in:</b>	0.5
HIST 5900 [0.5]	Directed Research
<b>4. 1.0 credit in:</b>	1.0
HIST 5908 [1.0]	M.A. Research Essay
<b>Total Credits</b>	<b>4.0</b>

#### M.A. History with Collaborative Specialization in Accessibility (4.5 credits)

##### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>	1.0
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ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>3. 1.0 credit in HIST</b> at the graduate level at Carleton; up to 0.5 credit may be taken in designated public history courses. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.0
<b>4. 2.0 credits in:</b>	2.0
HIST 5909 [2.0]	M.A. Thesis (in the specialization)
<b>Total Credits</b>	<b>4.5</b>

##### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>	1.0
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>3. 1.5 credits in HIST</b> at the graduate level at Carleton; up to 0.5 credit may be taken in designated public history courses. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.5
<b>4. 0.5 credit in:</b>	0.5
HIST 5900 [0.5]	Directed Research
<b>5. 1.0 credit in:</b>	1.0
HIST 5908 [1.0]	M.A. Research Essay (in the specialization)
<b>Total Credits</b>	<b>4.5</b>

#### M.A. History with Collaborative Specialization in African Studies (4.5 credits)

##### Requirements - Research Essay pathway (4.5 credits)

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>4. 2.0 credits in HIST</b> at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	2.0
<b>5. 0.5 credit in:</b>	0.5
HIST 5900 [0.5]	Directed Research
<b>6. 1.0 credit in:</b>	1.0
HIST 5908 [1.0]	M.A. Research Essay (in the specialization)
<b>Total Credits</b>	<b>4.5</b>

**Requirements - Thesis pathway (4.5 credits)**

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>4. 1.5 credits in HIST</b> at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.5
<b>5. 2.0 credits in:</b>	2.0
HIST 5909 [2.0]	M.A. Thesis (in the specialization)
<b>Total Credits</b>	<b>4.5</b>

**M.A. History  
with Collaborative Specialization in Climate  
Change (4.5 credits)****Requirements - research essay pathway (4.5 credits):**

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0]	Climate Collaboration
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]	Climate Seminar Series
<b>3. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>4. 1.5 credits in HIST</b> at the graduate level of which only 0.5 credit may be taken in a designated public history course. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.5
<b>5. 0.5 credit in:</b>	0.5
HIST 5900 [0.5]	Directed Research
<b>6. 1.0 credit in:</b>	1.0
HIST 5908 [1.0]	M.A. Research Essay (in the specialization)
<b>Total Credits</b>	<b>4.5</b>

**Requirements - thesis pathway (4.5 credits):**

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0]	Climate Collaboration
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]	Climate Seminar Series
<b>3. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>4. 1.0 credit in HIST</b> at the graduate level of which only 0.5 credit may be taken in a designated public history course. With departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.0
<b>5. 2.0 credits in:</b>	2.0
HIST 5909 [2.0]	M.A. Thesis (in the specialization)
<b>Total Credits</b>	<b>4.5</b>

**M.A. History  
with Collaborative Specialization in Data  
Science (4.5 credits)****Requirements:**

<b>1. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>2. 1.5 credits in HIST</b> at the graduate level of which only 0.5 credit may be taken in a designated public history course; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.5
<b>3. 0.5 credit in:</b>	0.5
HIST 5706 [0.5]	Digital History
<b>4. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>5. 0.5 credit in:</b>	0.5
HIST 5900 [0.5]	Directed Research
<b>6. 1.0 credit in:</b>	1.0
HIST 5908 [1.0]	M.A. Research Essay (in the specialization)
<b>Total Credits</b>	<b>4.5</b>

**M.A. History  
with Collaborative Specialization in Digital  
Humanities (4.5 credits)****Requirements:**

<b>1. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method
<b>2. 1.0 credit in HIST</b> at the graduate level at Carleton; up to 0.5 credit may be taken in a designated public history course; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.0
<b>3. 2.0 credits in:</b>	2.0
HIST 5909 [2.0]	M.A. Thesis (in the specialization)
<b>4. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>5. 0.5 credit in DIGH</b> (DIGH 5011, DIGH 5012, or annually listed DIGH course)	0.5
<b>6. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>Total Credits</b>	<b>4.5</b>

**M.A. History  
with Collaborative Specialization in Latin  
American and Caribbean Studies (4.5 credits)****Requirements - Research Essay pathway (4.5 credits)**

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 0.5 credit in:</b>	0.5
HIST 5003 [0.5]	Historical Theory and Method

**4. 2.0 credits in HIST** at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution. 2.0

**5. 0.5 credit in:** 0.5  
HIST 5900 [0.5] Directed Research

**6. 1.0 credit in:** 1.0  
HIST 5908 [1.0] M.A. Research Essay (in the specialization)

**Total Credits** 4.5

#### Requirements - Thesis pathway (4.5 credits)

**1. 0.5 credit in:** 0.5  
LACS 5000 [0.5] Interdisciplinary Approaches to Latin American and Caribbean Studies

**2. 0.0 credit in:** 0.0  
LACS 5800 [0.0] Scholarly Preparation in Latin American and Caribbean Studies

**3. 0.5 credit in:** 0.5  
HIST 5003 [0.5] Historical Theory and Method

**4. 1.5 credits in HIST** at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution. 1.5

**5. 2.0 credits in:** 2.0  
HIST 5909 [2.0] M.A. Thesis (in the specialization)

**Total Credits** 4.5

#### M.A. Public History (5.0 credits)

##### Requirements:

**1. 0.5 credit in:** 0.5  
HIST 5003 [0.5] Historical Theory and Method

**2. 0.5 credit in:** 0.5  
HIST 5700 [0.5] Introduction to Public History

**3. 1.5 credits in** designated public history courses. With departmental permission, up to 0.5 credit may be taken in appropriate graduate-level courses from other units at Carleton University. 1.5

**4. 0.5 credit in** a graduate-level history course outside of public history. 0.5

**5. 0.5 credit in** any graduate-level history course. With departmental permission, students may take a graduate-level course in another unit at Carleton University, at the University of Ottawa, or at another accredited institution. 0.5

**6. 0.5 credit in:** 0.5  
HIST 5703 [0.5] Public History Internship

**7. 1.0 credit in:** 1.0  
HIST 5908 [1.0] M.A. Research Essay

**Total Credits** 5.0

#### M.A. Public History with Collaborative Specialization in Digital Humanities (5.0 credits)

##### Requirements:

**1. 0.5 credit in:** 0.5  
HIST 5003 [0.5] Historical Theory and Method

**2. 0.5 credit in:** 0.5  
HIST 5700 [0.5] Introduction to Public History

**3. 1.0 credit in** designated public history courses. 1.0

**4. 0.5 credit in** a graduate-level history course outside of public history. 0.5

**5. 0.5 credit in:** 0.5  
HIST 5703 [0.5] Public History Internship

**6. 1.0 credit in:** 1.0  
HIST 5908 [1.0] M.A. Research Essay (in the specialization)

**7. 0.5 credit in:** 0.5  
DIGH 5000 [0.5] Issues in the Digital Humanities

**8. 0.5 credit in** DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course) 0.5

**9. 0.0 credit in:** 0.0  
DIGH 5800 [0.0] Digital Humanities: Professional Development

**Total Credits** 5.0

#### Guidelines for Completion of Master's Degree

Full-time students in the thesis pathway are expected to finish all requirements for the degree except HIST 5909 during their first two terms of study. The thesis requirement is designed to take an additional two or three terms.

Full-time students in the research essay pathway are expected to finish all requirements for the degree except HIST 5908 during their first two terms of study. The research essay requirement is designed to take an additional term.

Full-time students in the M.A. in Public History normally complete HIST 5003, HIST 5700, and 1.5 credits of courses in the first two terms; HIST 5703 Public History Internship during the summer term; and 1.0 credit of courses and HIST 5908 during the fall and winter terms of the second year. Courses that are designated as fulfilling the public history requirement include: HIST 5701, HIST 5702, HIST 5705, HIST 5706, HIST 5707, and HIST 5709.

Part-time students should complete all degree requirements except the thesis within twelve terms of study.

M.A. students are required to submit thesis or research essay proposals to the graduate advisor during their second term of full-time enrollment. Part-time students should discuss the timing of this requirement with the Department.

#### Language Requirements

All candidates are required to demonstrate a reading knowledge of a language other than English, the choice to depend upon the field of the candidate's thesis or research. For seminars dealing with sources not in English, a reading knowledge of the appropriate language will be required before acceptance into the program. Details may be obtained from the supervisor of graduate studies.

#### Ph.D. History (5.0 credits)

##### Requirements:

**1. 1.0 credit in:** 1.0

HIST 6808 [1.0]	Doctoral Seminar in Historical Theory and Method	
<b>2. 1.5 credits in:</b>		<b>1.5</b>
HIST 6906 [0.5]	Ph.D. Tutorials (in the candidate's field; taken three times)	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
HIST 6907 [0.5]	Ph.D. Comprehensive Examination	
<b>4. 1.0 credit in</b>	approved courses in a Cognate Area	<b>1.0</b>
<b>5. 1.0 credit in</b>	Professional Development courses:	<b>1.0</b>
HIST 6805 [0.5]	Professional Development Project I	
HIST 6806 [0.5]	Professional Development Project II	
	Or another approved course.	
<b>6. 0.0 credit in:</b>		<b>0.0</b>
HIST 6909 [0.0]	Ph.D. Thesis	
<b>Total Credits</b>		<b>5.0</b>

### Ph.D. History with Concentration in Public History (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
HIST 6808 [1.0]	Doctoral Seminar in Historical Theory and Method	
<b>2. 1.5 credits in:</b>		<b>1.5</b>
HIST 6906 [0.5]	Ph.D. Tutorials (in Public History, taken three times)	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
HIST 6908 [0.5]	Ph.D. Comprehensive Examination in Public History	
<b>4. 1.0 credit in</b>	approved courses in a Cognate Area	<b>1.0</b>
<b>5. 1.0 credit in:</b>		<b>1.0</b>
HIST 6809 [0.5]	Internship in Applied History Preparation Course	
HIST 6810 [0.5]	Internship in Applied History	
<b>6. 0.0 credits in:</b>		<b>0.0</b>
HIST 6909 [0.0]	Ph.D. Thesis	
<b>Total Credits</b>		<b>5.0</b>

### Ph.D. History with Collaborative Specialization in Political Economy (5.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
PECO 6000 [0.5]	Political Economy: Core Concepts	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
HIST 6701 [0.5]	History and Political Economy	
	Or 0.5 credit in a relevant political economy course from the approved list.	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
HIST 6808 [1.0]	Doctoral Seminar in Historical Theory and Method	
<b>4. 1.5 credits in:</b>		<b>1.5</b>
HIST 6906 [0.5]	Ph.D. Tutorials (in the candidate's field; taken three times)	
<b>5. 0.5 credits in:</b>		<b>0.5</b>
HIST 6907 [0.5]	Ph.D. Comprehensive Examination	
<b>6. 1.0 credit in</b>	Professional Development courses:	<b>1.0</b>
HIST 6805 [0.5]	Professional Development Project I	

HIST 6806 [0.5]	Professional Development Project II	
	Or another approved course.	
<b>7. 0.0 credits in:</b>		
HIST 6909 [0.0]	Ph.D. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### Ph.D. Tutorials and Comprehensive Examination

All students complete 1.5 credits of tutorials (HIST 6906) in their major field in their first year. After completing three terms of tutorials, students will undertake a comprehensive examination in the major field. The exam will have both written and oral components.

#### Cognate Area

All students complete 1.0 credit in a cognate area that complements their major field of study. The requirement is met through completion of 1.0 credit in HIST courses at the 5000- or 6000-level or, with permission of the Graduate Supervisor, in graduate level courses from another unit at Carleton or the University of Ottawa.

#### Professional Development Project

All students undertake a professional development project (1.0 credit) that enhances and complements their program of study and career goals. The nature of the professional development project is flexible and is to be determined jointly by the student, their dissertation advisor, and the Graduate Supervisor.

#### Language Requirement

All students must demonstrate proficiency in a language other than English allied to their program of study. The appropriate language requirement will be determined in conjunction with their dissertation advisor and the Graduate Supervisor. Proficiency is normally demonstrated through completion of the departmental language exam or course credits approved by the department. Language requirements must be met by the end of the student's second year of study.

### Regulations

See the General Regulations section of this Calendar.

### Regulations

See the General Regulations section of this Calendar.

### Admission

The minimum requirement for admission to the master's program is an Honours bachelor's degree (or the equivalent) with at least high honours standing.

The Department offers no qualifying-year program; applicants with a three-year non-honours degree may be considered for admission into the fourth year of Carleton's B.A. (Honours) program.

### Admission

The normal requirement for admission to the Ph.D. program is a master's degree (or equivalent) in history, with a minimum average of A-.

A student already enrolled in the Carleton M.A. program in History or Public History who shows outstanding academic performance and research promise may be permitted to transfer to the Ph.D. program upon the recommendation of the History graduate committee and upon successful

completion of HIST 5003 together with 1.5 additional credits at the 5000-level, including at least 1.0 credit in History or Public History.

## **History (HIST) Courses**

### **HIST 5003 [0.5 credit]**

#### **Historical Theory and Method**

An exploration of some of the theories, concepts and methodologies used in historical practice.

Includes: Experiential Learning Activity

### **HIST 5210 [0.5 credit]**

#### **Power**

A seminar on power and its deployment in Europe, whether by states and other political entities or in relation to gender, race, the body, private and public identities, and the family. Theories and philosophies of power and its exercise will be examined.

Includes: Experiential Learning Activity

### **HIST 5211 [0.5 credit]**

#### **Consumption**

A seminar exploring the development of European cultures of consumption and exchange of commodities and services. Examined in relation to gender, ideology, imperialism, social distinction, and everyday life, topics may include markets, food, clothing, material goods, leisure, and work.

Includes: Experiential Learning Activity

### **HIST 5212 [0.5 credit]**

#### **European History Special Topics**

A seminar on a thematic, transnational or regional topic related to European history. Topics will vary from year to year.

### **HIST 5314 [0.5 credit]**

#### **Colonialism and Postcolonialism in Canada**

A seminar on selected topics related to the histories and historiography of colonialism and postcolonialism in Canada.

Includes: Experiential Learning Activity

### **HIST 5315 [0.5 credit]**

#### **State and Society in Canadian History**

A seminar on selected topics related to the histories and historiography of political culture, state formation, and social relations in Canada.

Includes: Experiential Learning Activity

### **HIST 5316 [0.5 credit]**

#### **Canadian History Special Topics**

A seminar on a thematic or regional topic related to Canadian history. Topics will vary from year to year.

### **HIST 5410 [0.5 credit]**

#### **United States History Special Topics**

A seminar on a thematic topic related to the history of the United States of America. Topics will vary from year to year.

### **HIST 5510 [0.5 credit]**

#### **Gender History Special Topics**

A seminar on a topic related to gender and/or women's history. Topics will vary from year to year.

### **HIST 5511 [0.5 credit]**

#### **History of Sexuality Special Topics**

A seminar on a topic related to the history of sexuality. Topics will vary from year to year.

### **HIST 5604 [0.5 credit]**

#### **Central Europe, Past and Present**

Evolution and current status of Central Europe, from periods of foreign control in the late nineteenth and twentieth centuries to independent statehood. Emphasis on national accommodations and conflicts.

Also listed as EURR 5204.

### **HIST 5607 [0.5 credit]**

#### **Imperial Russia and the Russian Revolution**

Examination of the expansion and downfall of tsarist Russia from the eighteenth century to the revolutionary era and the establishment of Bolshevik rule. Topics include the relationship between the monarchy and subject peoples, social and economic change, and daily life.

Includes: Experiential Learning Activity

Also listed as EURR 5305.

### **HIST 5608 [0.5 credit]**

#### **The Soviet Union: Power and Culture**

Examination of the rise of the Soviet Union to a global power and subsequent tensions that promoted its collapse. The course will analyze Stalinism, the Second World War, the Thaw, and Brezhnev and Gorbachev eras through the lens of the USSR's citizens.

Includes: Experiential Learning Activity

Also listed as EURR 5306.

### **HIST 5700 [0.5 credit]**

#### **Introduction to Public History**

Introduction to the professional and academic dimensions of public history with a focus on theory, method, ethics, modes of storytelling, and the politics of the past. The course also serves as a foundation for the M.A. in Public History programs.

Includes: Experiential Learning Activity

Prerequisite(s): Open only to students enrolled in the M.A. Public History programs, or with permission of the Department.

**HIST 5701 [0.5 credit]****Archival Theory and Practice**

Theories, methodologies and problems relating to archives and records management including principles and concepts guiding the work of archivists; records appraisal, collection, arrangement, description; special attention to archival communities including Library and Archives Canada.

Includes: Experiential Learning Activity

**HIST 5702 [0.5 credit]****Public History Special Topics**

Theoretical and practical instruction in topical areas such as digitizing history, oral history, local history, photography, material history, performance, etc.

Includes: Experiential Learning Activity

**HIST 5703 [0.5 credit]****Public History Internship**

Placement for a term, normally over the summer following the first year of study, to put into practice the precepts learned in course work. Students will be jointly supervised by their employers and a faculty member. Graded Sat/Uns.

Includes: Experiential Learning Activity

**HIST 5705 [0.5 credit]****Museums, National Identity and Public Memory**

Explores how national museums and similar institutions construct narratives and represent histories through processes of collection, preservation and exhibition. Topics include memory and identity; theory of museums; contestation; inclusivity and authority; cultural politics and heritage.

Includes: Experiential Learning Activity

**HIST 5706 [0.5 credit]****Digital History**

Methods and theories of public history through the lens of computation, digital technologies and allied fields.

Includes: Experiential Learning Activity

**HIST 5707 [0.5 credit]****Narrativity and Performance in Public History**

Theory and practice of storytelling and performance in public history through a variety of forms, media, and contexts.

Includes: Experiential Learning Activity

**HIST 5709 [0.5 credit]****Photography and Public History**

The social history of photographic practices with an emphasis on the photograph as a material object. Traces the reproduction, circulation, and exhibition of photographs in a variety of contexts.

**HIST 5710 [0.5 credit]****Race and Empire**

A seminar examining how discourses on race have been used to construct visions of empire. Students will be introduced to relevant historiographical, theoretical, discursive, and methodological approaches to race and empire.

**HIST 5711 [0.5 credit]****Migration and Diaspora History Special Topics**

A seminar on the cultural, economic, political and social implications of the movement of people in historical and contemporary contexts. It takes a multidisciplinary and multiscale approach to topics such as citizenship, forced migration, diasporic communities, exile, immigration, global identities and transnationalism.

Also listed as MGDS 5201.

**HIST 5712 [0.5 credit]****African History Special Topics**

A seminar on a thematic or regional topic related to African history. Topics will vary from year to year.

**HIST 5713 [0.5 credit]****Latin America and Caribbean History Special Topics**

A seminar on a thematic or regional topic related to Latin America or Caribbean history. Topics will vary from year to year.

**HIST 5803 [0.5 credit]****History of Women, Gender and Sexuality: Foundations**

Selected problems in the historiography of women, gender and sexuality.

Includes: Experiential Learning Activity

Precludes additional credit for HIST 5807 (no longer offered).

**HIST 5900 [0.5 credit]****Directed Research**

A course designed for students and supervisors to confer regularly in preparation for the research essay. Graded satisfactory/unsatisfactory upon a written report from the supervisor.

Prerequisite(s): open only to students enrolled in the Research Essay option of the regular M.A.

**HIST 5902 [1.0 credit]****Directed Studies**

A program of supervised reading and preparation of written work in an area not covered by an existing graduate seminar.

**HIST 5904 [0.5 credit]****Directed Studies**

A program of supervised reading and preparation of written work in an area not covered by an existing graduate seminar.

**HIST 5906 [0.5 credit]****Selected Topics**

A seminar in an area not covered by an existing graduate course.

**HIST 5908 [1.0 credit]****M.A. Research Essay**

An examination of an approved topic in an area of departmental specialization or in an appropriate area of Public History.

Includes: Experiential Learning Activity

**HIST 5909 [2.0 credits]****M.A. Thesis**

A substantial historical investigation. The subject will be determined in consultation with the Department, and a supervisor will be assigned. The candidate will be examined orally after presenting his/her thesis.

Includes: Experiential Learning Activity

**HIST 6110 [0.5 credit]****History of Modern Europe**

Directed readings in modern European history.

**HIST 6111 [0.5 credit]****History of France**

Directed readings in French history.

**HIST 6112 [0.5 credit]****History of Russia**

Directed readings in Russian history.

**HIST 6113 [0.5 credit]****History of Germany**

Directed readings in German history.

**HIST 6210 [0.5 credit]****History of Early Modern Europe**

Directed readings in early modern European history.

**HIST 6211 [0.5 credit]****History of Medieval Europe**

Directed readings in medieval European history.

**HIST 6212 [0.5 credit]****History of Ancient Rome**

Directed readings in ancient Roman history.

**HIST 6310 [0.5 credit]****History of Africa**

Directed readings in African history.

**HIST 6311 [0.5 credit]****History of the African Diaspora**

Directed readings in the history of the African Diaspora.

**HIST 6312 [0.5 credit]****History of Latin America**

Directed readings in Latin American history.

**HIST 6313 [0.5 credit]****History of the Caribbean**

Directed readings in Caribbean history.

**HIST 6410 [0.5 credit]****History of the United States**

Directed readings in U.S. history.

**HIST 6510 [0.5 credit]****British History**

Directed readings in British history.

**HIST 6601 [0.5 credit]****Transnational or Thematic History**

Directed readings in a transnational or thematic topic.

**HIST 6604 [0.5 credit]****Directed Studies**

A program of supervised reading and preparation of written work in an area not covered by an existing graduate seminar.

**HIST 6605 [0.5 credit]****Selected Topics**

A seminar in an area not covered by an existing graduate course.

**HIST 6609 [1.0 credit]****Digital History and Digital Humanities**

A program of supervised reading in Digital History and Digital Humanities, leading to a digitally-mediated piece.

**HIST 6612 [0.5 credit]****Public History**

Directed readings in Public History.

**HIST 6613 [0.5 credit]****History of South Asia**

Directed readings in South Asian history.

**HIST 6701 [0.5 credit]****History and Political Economy**

A program of supervised readings in political economy and history. When taken in conjunction with PECO 6000, will be considered a breadth-requirement course.

**HIST 6805 [0.5 credit]****Professional Development Project I**

A project related to the student's doctoral program such as the preparation of an article-length essay, the design of an undergraduate course, internship, or curatorial initiative. Graded Sat./Uns.

Includes: Experiential Learning Activity

**HIST 6806 [0.5 credit]****Professional Development Project II**

A 0.5 credit project related to the student's doctoral program such as the preparation of an article-length essay, the design of an undergraduate course, internship, or curatorial initiative. Graded Sat./Uns.

Includes: Experiential Learning Activity

**HIST 6808 [1.0 credit]****Doctoral Seminar in Historical Theory and Method**

A critical examination of theories, concepts and methodological approaches in the discipline of history.

Includes: Experiential Learning Activity

**HIST 6809 [0.5 credit]****Internship in Applied History Preparation Course**

A course of study to equip students with specialized skills and knowledge for the internship placement in applied history.

Includes: Experiential Learning Activity

**HIST 6810 [0.5 credit]****Internship in Applied History**

An internship, normally of four months duration, in any field of applied history.

Includes: Experiential Learning Activity

**HIST 6906 [0.5 credit]****Ph.D. Tutorials**

A program of directed readings in the student's major research field. Students normally complete three terms (fall, winter, summer) of tutorials before sitting the comprehensive examination.

**HIST 6907 [0.5 credit]****Ph.D. Comprehensive Examination**

An examination of defined topics in the student's major research field. A written examination followed by an oral examination.

**HIST 6908 [0.5 credit]****Ph.D. Comprehensive Examination in Public History**

An examination of defined topics in the field of Public History. A written examination followed by an oral examination.

**HIST 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

**HIST 6911 [0.5 credit]****Canadian History**

Directed readings in Canadian history.

**HIST 6913 [0.5 credit]****History of Women, Gender, and Sexuality**

Directed readings in the history of women, gender and sexuality.

# Human-Computer Interaction

This section presents the requirements for programs in:

- **Master of Human-Computer Interaction**
- **Master of Human-Computer Interaction with Collaborative Specialization in Accessibility**

## Master of Human-Computer Interaction (5.0 credits)

### Requirements:

<b>1. 0.5 credit in:</b>		0.5
HCIN 5100 [0.5]	Fundamentals of HCI Design and Evaluation	
<b>2. 0.5 credit in:</b>		0.5
HCIN 5200 [0.5]	Software and User Interface Development	
<b>3. 0.5 credit in:</b>		0.5
HCIN 5300 [0.5]	Emerging Interaction Techniques	
<b>4. 0.5 credit from</b> the following, to be selected with the approval of the supervisor		0.5
HCIN 5400 [0.5]	Experimental Methods and Statistics	
HCIN 5403 [0.5]	Research methods in HCI	
HCIN 5404 [0.5]	Design Research Methods	
HCIN 5407 [0.5]	Empirical Research Methods in HCI	
<b>5. 0.5 credit from</b> a wide range of available electives with guidance from the student's supervisor and permission from the Director of the MHCI program		0.5
<b>6. 2.5 credits in:</b>		2.5
HCIN 5909 [2.5]	Thesis in Human-Computer Interaction	
<b>Total Credits</b>		<b>5.0</b>

## Master of Human-Computer Interaction with Collaborative Specialization in Accessibility (5.5 credits)

### Requirements:

<b>1. 0.5 credit in:</b>		0.5
HCIN 5100 [0.5]	Fundamentals of HCI Design and Evaluation	
<b>2. 0.5 credit in:</b>		0.5
HCIN 5200 [0.5]	Software and User Interface Development	
<b>3. 0.5 credit in:</b>		0.5
HCIN 5300 [0.5]	Emerging Interaction Techniques	
<b>4. 0.5 credit from</b> the following, to be selected with the approval of the supervisor		0.5
HCIN 5400 [0.5]	Experimental Methods and Statistics	
HCIN 5403 [0.5]	Research methods in HCI	
HCIN 5404 [0.5]	Design Research Methods	
HCIN 5407 [0.5]	Empirical Research Methods in HCI	
<b>5. 1.0 credit in:</b>		1.0
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>6. 2.5 credits in:</b>		2.5

HCIN 5909 [2.5] Thesis in Human-Computer Interaction (in the specialization)

### Total Credits

5.5

## Regulations

See the General Regulations section of this Calendar.

### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the Master of Human-Computer Interaction is considered a regularly scheduled break approved by Carleton University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## Admission

Applicants for the M.H.C.I. program will normally hold an honours degree or equivalent professional degree in a related field such as architecture, arts and social sciences, business, cognitive science, computer science, engineering, information technology.

In addition to transcripts and letters of reference, application packages must include a statement of interest outlining the applicant's relevant background and proposed area of research.

Applicants judged to be generally acceptable but still requiring some preparation may be asked to complete course work in addition to the program requirements.

## Human-Computer Interaction (HCIN) Courses

### HCIN 5100 [0.5 credit]

#### Fundamentals of HCI Design and Evaluation

Strategies and practices in HCI design and evaluation. Students will learn to perform studies in user interface analysis and design, read research literature critically, distill important points from readings, summarize, write papers, design user interfaces and present their work. Precludes additional credit for PSYC 5105 (no longer offered).

### HCIN 5200 [0.5 credit]

#### Software and User Interface Development

Design and development of user interfaces for software systems based on principles for supporting user interaction, with emphasis on frameworks, tools, and processes for user interface development.

**HCIN 5300 [0.5 credit]****Emerging Interaction Techniques**

Advanced interaction styles and their associated technologies. Topics may include hand held and gestural interactions, ubiquitous computing, deformable user interfaces, physiological computing and tangible user interfaces.

Also listed as ITEC 5204.

**HCIN 5400 [0.5 credit]****Experimental Methods and Statistics**

An introduction to the design of experiments and the statistics needed to interpret data.

Also listed as CGSC 5101.

**HCIN 5403 [0.5 credit]****Research methods in HCI**

An introduction to quantitative and qualitative research methods in HCI. Students will acquire skills in collecting and analyzing HCI data, presenting the findings and specifying practical implications.

Precludes additional credit for PSYC 5106 (no longer offered).

**HCIN 5404 [0.5 credit]****Design Research Methods**

Critical review of qualitative and quantitative research methods to support interdisciplinary design. Methods used by collaborators from the sciences and humanities as well as methods designers bring to interdisciplinary collaborations are introduced. Research for design, research through design and theoretical frameworks are discussed.

Includes: Experiential Learning Activity

Also listed as IDES 5102.

**HCIN 5407 [0.5 credit]****Empirical Research Methods in HCI**

Advanced quantitative methods and conducting controlled user studies, statistically analyzing and reporting results in a research paper. Topics include history of empirical HCI, experiment design, hypothesis testing, interaction models, and scientific writing. Students complete a term-long research project.

Includes: Experiential Learning Activity

Also listed as ITEC 5209.

Also offered at the undergraduate level, with different requirements, as ITEC 4021, for which additional credit is precluded.

**HCIN 5501 [0.5 credit]****Virtual Reality and 3D User Interfaces**

Research in and design of virtual reality and 3D systems. Applications, history, human factors, display and input hardware, and interaction techniques for navigation, selection and manipulation. Students develop and evaluate a VR or 3D system using game engines and devices such as head-mounted displays.

Includes: Experiential Learning Activity

Also listed as ITEC 5208.

**HCIN 5900 [0.5 credit]****Directed Studies**

Independent study under supervision of a member of the Human/Computer Interaction faculty. Students are required to obtain their supervisor's written approval prior to registration and are limited to one such course in their program.

Prerequisite(s): Enrolment in the HCI program and permission of the program Director.

**HCIN 5901 [0.5 credit]****Advanced Topics**

Topics not ordinarily treated in the regular course program due to their contemporary subject matter. The choice of topics varies from year to year. Details will be available at the time of registration.

**HCIN 5909 [2.5 credits]****Thesis in Human-Computer Interaction**

## Human Rights and Social Justice

This section presents the requirements for programs in:

- **M.A. Human Rights and Social Justice**

### Program Requirements

#### M.A. Human Rights and Social Justice (4.0 credits)

##### Requirements - Thesis pathway:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
HRSJ 5901 [0.5]	Critical Approaches to Human Rights and Social Justice	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
HRSJ 5902 [0.5]	Critical Methodologies in Human Rights and Social Justice	
<b>3. 1.0 credit in</b>	5000-level HRSJ courses or approved graduate courses from outside of the department. No more than 1.0 credit in Directed Studies may be used to fulfil degree requirements.	<b>1.0</b>
<b>4. 2.0 credits in:</b>		<b>2.0</b>
HRSJ 5909 [2.0]	Thesis	
<b>Total Credits</b>		<b>4.0</b>

##### Requirements - Research essay pathway:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
HRSJ 5901 [0.5]	Critical Approaches to Human Rights and Social Justice	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
HRSJ 5902 [0.5]	Critical Methodologies in Human Rights and Social Justice	
<b>3. 2.0 credits in</b>	5000-level HRSJ courses or approved graduate courses from outside of the department. No more than 1.0 credit in Directed Studies may be used to fulfil degree requirements.	<b>2.0</b>
<b>4. 1.0 credit in:</b>		<b>1.0</b>
HRSJ 5908 [1.0]	Research Essay	
<b>Total Credits</b>		<b>4.0</b>

##### Requirements - Coursework pathway:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
HRSJ 5901 [0.5]	Critical Approaches to Human Rights and Social Justice	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
HRSJ 5902 [0.5]	Critical Methodologies in Human Rights and Social Justice	
<b>3. 3.0 credits in</b>	5000-level HRSJ courses or approved graduate courses from outside of the department. No more than 1.0 credit in Directed Studies may be used to fulfil degree requirements.	<b>3.0</b>
<b>Total Credits</b>		<b>4.0</b>

### Admission

The normal requirement for admission to the M.A. Human Rights and Social Justice is a B.A. Honours degree with a minimum B+ average in human rights or social justice or a related field, and demonstrated English proficiency.

Applicants possessing an undergraduate honours degree from other fields of study may be admitted with additional requirements which will be specified on the offer of admission.

## Regulations

### Regulations

See the General Regulations section of this Calendar.

### Human Rights and Social Justice (HRSJ) Courses

#### HRSJ 5302 [0.5 credit]

##### Sexuality, Gender and Social Justice

Draws on sexuality studies, Trans studies and other interdisciplinary fields of critical scholarship to analyse sex, gender and sexuality as governing relations, their intersection with other systemic power relations (e.g. colonialism, capitalism), and resistance efforts grounded in social justice politics.

Includes: Experiential Learning Activity

#### HRSJ 5303 [0.5 credit]

##### Critical Race Theory

Discourses of global racism against Black, Indigenous, and people of colour; ongoing colonization, social criminalization, and gendered and racialized immigration policies examined from grounded theory and practice of anti-racist work.

#### HRSJ 5304 [0.5 credit]

##### Narratives of Human Rights

Ways in which literature and other narrative modes (media, memoir, documentary, film, art, music) engage with the political landscapes around issues of human rights and social justice; the role of these narratives in representation, spectatorship, and power.

#### HRSJ 5305 [0.5 credit]

##### Population Health and Human Rights

This course connects progressive thinking about the distribution of diseases among different historically situated groups of people with critical ideas about human rights and social justice. It injects political and historical thinking into dominant ideas and understandings of disease etiology and causes of ill-health.

Includes: Experiential Learning Activity  
Seminar

#### HRSJ 5306 [0.5 credit]

##### Terrorism and Islamophobia

Post-9/11 Islamophobia in the West and resulting human rights concerns around issues of terrorism, surveillance, exclusion, and anti-immigrant sentiments. Political contexts at play in the social construction of terrorism through popular media and language.

**HRSJ 5502 [0.5 credit]****Global Indigenous Knowledges**

Indigenous Peoples' contributions to world knowledges through community resistance and resurgence, social movements, community arts, and scholarship. How colonialism, capitalism, and patriarchy normalize plundering, dispossession and epistemic violence and impact Indigenous and non-human life.

Includes: Experiential Learning Activity

**HRSJ 5503 [0.5 credit]****Social and Environmental Justice**

Global, domestic and international socioenvironmental issues examined through perspectives of anti-colonial, decolonial justice and grassroots praxis. Topics may include corporate mining, food sovereignty, environmental violence(s), green capitalism, Indigenous feminisms, and climate injustices.

Includes: Experiential Learning Activity

**HRSJ 5504 [0.5 credit]****Citizenship and Political Violence**

How political violence produces, destabilizes, and transforms various regimes of citizenship, including formal citizenship and socio-cultural conceptions legitimating group membership. Legal, socio-cultural, and spatial practices of making and unmaking citizens in the execution of political violence.

**HRSJ 5505 [0.5 credit]****Global Labour Justice**

Exploration of the changing world of labor with a focus on workers' struggles and the neoliberal assault on the global working class; the conjoining struggles of global north and south workers and their quest for social justice and self-determination.

Includes: Experiential Learning Activity

**HRSJ 5506 [0.5 credit]****Global Childhoods**

Investigation of the political, economic, health, and social experiences of childhood and youth as a global community and as producers of knowledge in context of settler colonial structures. Topics may include global migration, climate crisis, education, labour, political violence, health, community practices, and accessibility.

**HRSJ 5901 [0.5 credit]****Critical Approaches to Human Rights and Social Justice**

Selected topics related to anti-colonial/decolonial scholarship aimed to dismantle and destabilize conceptualizations of human rights and social justice discourses. This seminar examines knowledges that resist legalistic ideals of human rights and social justice in their struggle towards transformative justice and politics.

**HRSJ 5902 [0.5 credit]****Critical Methodologies in Human Rights and Social Justice**

Methodologies and epistemologies related to research practices grounded in anti-colonial and decolonial knowledge, theories, and methods. Students may be asked to apply these acquired skills to conduct research in the field and communities.

Includes: Experiential Learning Activity

**HRSJ 5905 [0.5 credit]****Practicum**

Grounded in experiential learning principles and community engagement practices, students work with partnering institutions and organizations or social justice initiatives and movements to situate their scholastic knowledge of rights-based advocacy and struggles to achieve social justice. Graded SAT/UNS.

Includes: Experiential Learning Activity

**HRSJ 5908 [1.0 credit]****Research Essay**

Examination of an approved topic in an area of specialization of either the Institute faculty or associated faculty from across the University. Students will have a supervisor and a second reader.

Includes: Experiential Learning Activity

**HRSJ 5909 [2.0 credits]****Thesis****HRSJ 5910 [0.5 credit]****Directed Studies**

Directed study on selected topics may be arranged with a faculty member or visiting scholar with permission of the Institute.

Includes: Experiential Learning Activity

# Indigenous Policy and Administration

This section presents the requirements for programs in:

- **Master of Public Policy and Administration with Concentration in Indigenous Policy and Administration**
- **Graduate Diploma in Indigenous Policy and Administration**

## Master of Public Policy and Administration with Concentration in Indigenous Policy and Administration (7.0 credits)(7.5 credits - Thesis pathway)

To complete the M.P.P.A. program with a concentration in Indigenous Policy and Administration, students should notify the M.P.P.A. Supervisor when registering for their first year.

### Requirements - Coursework pathway (7.0 credits):

<b>1. 4.5 credits in core courses:</b>	<b>4.5</b>
PADM 5120 [0.5] Modern Challenges to Governance	
PADM 5121 [0.5] Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5] Public Management: Principles and Approaches	
PADM 5123 [0.5] Public Management in Practice	
PADM 5125 [0.5] Qualitative Methods for Public Policy	
or PADM 5715 [0.5] Policy Research and Evaluation for Indigenous Policy and Administration	
PADM 5126 [0.5] Quantitative Methods for Public Policy	
PADM 5127 [0.5] Microeconomics for Policy Analysis	
PADM 5128 [0.5] Macroeconomics for Policy Analysis	
PADM 5129 [0.5] Capstone Course	
<b>2. 0.5 credit in approved elective (see School website for details)</b>	<b>0.5</b>
<b>3. 0.5 credit in:</b>	<b>0.5</b>
PADM 5224 [0.5] Indigenous Policy (must be completed before registering in any of the electives for the IPA concentration in Item 4)	
<b>4. 1.5 credits from:</b>	<b>1.5</b>
PADM 5712 [0.5] Issues in Contemporary Governance: First Nations, Métis and Inuit	
PADM 5713 [0.5] Public Administration in Indigenous Organizations and Governments	
PADM 5714 [0.5] Financial Management in First Nations, Métis and Inuit Governments and Organizations	
PADM 5716 [0.5] Economic and Community Development in Indigenous Territories	
PADM 5719 [0.5] Indigenous Health and Social Policy	
PADM 5772 [0.5] Policy Seminar (Indigenous Policy and Administration)	

PADM 5703 [0.5] Directed Studies (Indigenous Public Administration)	
<b>Total Credits</b>	<b>7.0</b>
<b>Requirements - Research essay pathway (7.0 credits):</b>	
<b>1. 4.5 credits in core courses:</b>	<b>4.5</b>
PADM 5120 [0.5] Modern Challenges to Governance	
PADM 5121 [0.5] Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5] Public Management: Principles and Approaches	
PADM 5123 [0.5] Public Management in Practice	
PADM 5125 [0.5] Qualitative Methods for Public Policy	
or PADM 5715 [0.5] Policy Research and Evaluation for Indigenous Policy and Administration	
PADM 5126 [0.5] Quantitative Methods for Public Policy	
PADM 5127 [0.5] Microeconomics for Policy Analysis	
PADM 5128 [0.5] Macroeconomics for Policy Analysis	
PADM 5129 [0.5] Capstone Course	
<b>2. 0.5 credit in approved elective (see School website for details)</b>	<b>0.5</b>
<b>3. 0.5 credit in:</b>	<b>0.5</b>
PADM 5224 [0.5] Indigenous Policy (must be completed before registering in any of the electives for the IPA concentration in Item 3)	
<b>4. 0.5 credit from:</b>	<b>0.5</b>
PADM 5712 [0.5] Issues in Contemporary Governance: First Nations, Métis and Inuit	
PADM 5713 [0.5] Public Administration in Indigenous Organizations and Governments	
PADM 5714 [0.5] Financial Management in First Nations, Métis and Inuit Governments and Organizations	
PADM 5716 [0.5] Economic and Community Development in Indigenous Territories	
PADM 5719 [0.5] Indigenous Health and Social Policy	
PADM 5772 [0.5] Policy Seminar (Indigenous Policy and Administration)	
PADM 5703 [0.5] Directed Studies (Indigenous Public Administration)	
<b>5. 1.0 credit in:</b>	<b>1.0</b>
PADM 5908 [1.0] Research Essay	
<b>Total Credits</b>	<b>7.0</b>
<b>Requirements - Thesis pathway (7.5 credits):</b>	
<b>1. 4.5 credits in core courses:</b>	<b>4.5</b>
PADM 5120 [0.5] Modern Challenges to Governance	
PADM 5121 [0.5] Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5] Public Management: Principles and Approaches	
PADM 5123 [0.5] Public Management in Practice	
PADM 5125 [0.5] Qualitative Methods for Public Policy	

or PADM 5715 [0.5]	Policy Research and Evaluation for Indigenous Policy and Administration	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in</b>	approved elective (see School website for details)	0.5
<b>3. 0.5 credit in:</b>		0.5
PADM 5224 [0.5]	Indigenous Policy	
<b>4. 2.0 credits in:</b>		2.0
PADM 5909 [2.0]	M.P.P.A. Thesis	
<b>Total Credits</b>		<b>7.5</b>

**Master of Public Policy and Administration with Concentration in Indigenous Policy and Administration (Advanced Completion, 5.0 credits)(5.5 credits - Thesis pathway)**

**Requirements - Coursework pathway (5.0 credits):**

<b>1. 2.5 credits in</b>	core courses from:	2.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
or PADM 5715 [0.5]	Policy Research and Evaluation for Indigenous Policy and Administration	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in</b>	approved elective (see School website for details)	0.5
<b>3. 0.5 credit in:</b>		0.5
PADM 5224 [0.5]	Indigenous Policy (must be completed before registering in any of the electives for the IPA concentration in Item 3)	
<b>4. 1.5 credits from:</b>		1.5
PADM 5711 [0.5]	Indigenous-Canada Relations: Governance and Policy History	
PADM 5712 [0.5]	Issues in Contemporary Governance: First Nations, Métis and Inuit	
PADM 5713 [0.5]	Public Administration in Indigenous Organizations and Governments	
PADM 5714 [0.5]	Financial Management in First Nations, Métis and Inuit Governments and Organizations	
PADM 5716 [0.5]	Economic and Community Development in Indigenous Territories	

PADM 5719 [0.5]	Indigenous Health and Social Policy	
PADM 5772 [0.5]	Policy Seminar (Indigenous Policy and Administration)	
PADM 5703 [0.5]	Directed Studies (Indigenous Public Administration)	

**Note:**

Additional credits may be required, as specified on offer of admission.

**Total Credits** **5.0**

**Requirements - Research essay pathway (5.0 credits):**

<b>1. 2.5 credits in</b>	core courses from:	2.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
or PADM 5715 [0.5]	Policy Research and Evaluation for Indigenous Policy and Administration	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in</b>	approved elective (see School website for details)	0.5
<b>3. 0.5 credit in:</b>		0.5
PADM 5224 [0.5]	Indigenous Policy (must be completed before registering in any of the electives for the IPA concentration in Item 3)	
<b>4. 0.5 credit from:</b>		0.5
PADM 5711 [0.5]	Indigenous-Canada Relations: Governance and Policy History	
PADM 5712 [0.5]	Issues in Contemporary Governance: First Nations, Métis and Inuit	
PADM 5713 [0.5]	Public Administration in Indigenous Organizations and Governments	
PADM 5714 [0.5]	Financial Management in First Nations, Métis and Inuit Governments and Organizations	
PADM 5716 [0.5]	Economic and Community Development in Indigenous Territories	
PADM 5719 [0.5]	Indigenous Health and Social Policy	
PADM 5772 [0.5]	Policy Seminar (Indigenous Policy and Administration)	
PADM 5703 [0.5]	Directed Studies (Indigenous Public Administration)	
<b>4. 1.0 credit in:</b>		1.0
PADM 5908 [1.0]	Research Essay	

**Note:**

Additional credits may be required, as specified on offer of admission.

<b>Total Credits</b>	<b>5.0</b>
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**Requirements - Thesis pathway (5.5 credits):**

<b>1. 2.5 credits in</b> core courses from:	<b>2.5</b>
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PADM 5120 [0.5]	Modern Challenges to Governance
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PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change
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PADM 5122 [0.5]	Public Management: Principles and Approaches
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PADM 5123 [0.5]	Public Management in Practice
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PADM 5125 [0.5]	Qualitative Methods for Public Policy
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or PADM 5715 [0.5] Policy Research and Evaluation for Indigenous Policy and Administration

PADM 5126 [0.5]	Quantitative Methods for Public Policy
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PADM 5127 [0.5]	Microeconomics for Policy Analysis
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PADM 5128 [0.5]	Macroeconomics for Policy Analysis
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PADM 5129 [0.5]	Capstone Course
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<b>2. 0.5 credit in</b> approved elective (see School website for details)	<b>0.5</b>
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<b>3. 0.5 credit in:</b>	<b>0.5</b>
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PADM 5224 [0.5]	Indigenous Policy
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<b>4. 2.0 credits in:</b>	<b>2.0</b>
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PADM 5909 [2.0]	M.P.P.A. Thesis
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**Note:**

Additional credits may be required, as specified on offer of admission.

<b>Total Credits</b>	<b>5.5</b>
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**Graduate Diploma in Indigenous Policy and Administration  
(3.0 credits)**

**Requirements:**

Students must complete:

<b>1. 2.5 credits in:</b>	<b>2.5</b>
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PADM 5711 [0.5]	Indigenous-Canada Relations: Governance and Policy History
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PADM 5712 [0.5]	Issues in Contemporary Governance: First Nations, Métis and Inuit
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PADM 5713 [0.5]	Public Administration in Indigenous Organizations and Governments
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PADM 5714 [0.5]	Financial Management in First Nations, Métis and Inuit Governments and Organizations
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PADM 5715 [0.5]	Policy Research and Evaluation for Indigenous Policy and Administration
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<b>2. 0.5 credit in</b> elective, selected from other PADM courses or those offered by another unit, as approved by the I.P.A. Supervisor.	<b>0.5</b>
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<b>Total Credits</b>	<b>3.0</b>
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**Public Administration (PADM) Courses**

**PADM 5120 [0.5 credit]**

**Modern Challenges to Governance**

Modern challenges to states, citizens, and policy-making, explored with the help of contemporary and historical thinkers. Topics may include: inequality; national security and intelligence gathering; identity; globalization and global finance; trade agreements and property rights; climate change and environmental challenges.

Precludes additional credit for PADM 5115 (no longer offered).

**PADM 5121 [0.5 credit]**

**Policy Analysis: The Practical Art of Change**

Contemporary techniques of policy analysis. Topics may include: risk assessment, policy design, options analysis, and scenario-writing.

Precludes additional credit for PADM 5116 (no longer offered).

**PADM 5122 [0.5 credit]**

**Public Management: Principles and Approaches**

Principles and processes of public-sector management as they function through cabinet-parliamentary government, federalism, the public service and the judiciary. Institutional reforms and changes in the philosophy of public sector management.

Precludes additional credit for PADM 5117 (no longer offered).

**PADM 5123 [0.5 credit]**

**Public Management in Practice**

Contemporary public management practices. Topics may include: financial management, leadership, performance management, organizational design, human resource management, implementation.

**PADM 5124 [0.5 credit]**

**Law and Ethics**

The legal and normative environment of Canadian public administration, law, institutions and processes. The relationship between ethics, accountability and good governance. Canadian legal history, adjudicative procedures, delegation of powers to public authorities, procedural justice in decision making.

Precludes additional credit for PADM 5412 (no longer offered) and PADM 5413 (no longer offered).

**PADM 5125 [0.5 credit]****Qualitative Methods for Public Policy**

Qualitative methods and dimensions of policy research. Topics may include the formulation of research problems, research design and techniques for collecting and managing evidence, and the role of qualitative research in the analysis of public policies and programs.

Precludes additional credit for PADM 5715, PADM 5113 (no longer offered).

**PADM 5126 [0.5 credit]****Quantitative Methods for Public Policy**

Descriptive statistics, probability theory and sampling distributions, hypothesis testing of quantitative and qualitative population parameters, and regression analysis.

Precludes additional credit for PADM 5114 (no longer offered).

**PADM 5127 [0.5 credit]****Microeconomics for Policy Analysis**

Key concepts in microeconomic theory and their application to public policy. Topics may include incentives, rational choice theory, market structure, welfare economics, and strategic behaviour.

Precludes additional credit for PADM 5111 (no longer offered).

Prerequisite(s): ECON 1001 or equivalent.

**PADM 5128 [0.5 credit]****Macroeconomics for Policy Analysis**

Theoretical foundations and current policy issues that relate to the level and growth of expenditure and production are analyzed in the Canadian and international context.

Precludes additional credit for PADM 5112 (no longer offered).

Prerequisite(s): ECON 1002 or equivalent.

**PADM 5129 [0.5 credit]****Capstone Course**

An integrative workshop-based course in which teams of students develop and present strategies to address a policy problem.

Includes: Experiential Learning Activity

**PADM 5211 [0.5 credit]****Intergovernmental Relations**

Major cost-sharing and fiscal transfer agreements.

The intergovernmental mechanisms for policy and administrative coordination in selected policy fields.

Precludes additional credit for PADM 5003 (no longer offered).

**PADM 5212 [0.5 credit]****Civil Society and Public Policy**

The influence of various interests, social movements, voluntary organizations and citizens in the policy process in a Canadian and comparative context.

**PADM 5213 [0.5 credit]****Gender and Public Policy**

The impact of public policy on gender relations and how gender relations shape policy. Topics covered may include gender inequalities in earnings and employment, macroeconomic policy, gender and development, and gender-based analysis.

Precludes additional credit for PADM 4701 and PADM 5701 (no longer offered).

Also offered at the undergraduate level, with different requirements, as PADM 4213, for which additional credit is precluded.

**PADM 5214 [0.5 credit]****Budgetary Policy in the Public Sector**

Selected aspects of the expenditure and revenue budget and budgetary process at all levels of government. Critical review of actual budgets and budgetary processes.

Precludes additional credit for PADM 5103 (no longer offered).

Also offered at the undergraduate level, with different requirements, as PADM 4214, for which additional credit is precluded.

**PADM 5215 [0.5 credit]****Benefit-Cost Analysis**

Benefit-cost analysis and its application to public-sector investment, pricing policy, discount rates, marginal cost and shadow pricing, and the handling of risk and uncertainty.

Prerequisite(s): PADM 5127 or equivalent.

**PADM 5218 [0.5 credit]****Analysis of Socio-economic Data**

Correlation and regression analyses to test hypotheses about the relationships between socio-economic variables.

Prerequisite(s): PADM 5126 or equivalent.

**PADM 5220 [0.5 credit]****Regulation and Public Policy**

Political, economic, legal, and organizational theories of regulation in the Canadian and comparative context. Processes and consequences of regulatory practice in selected Canadian public policy fields.

Also offered at the undergraduate level, with different requirements, as PADM 4220, for which additional credit is precluded.

**PADM 5221 [0.5 credit]****Health Policy in Canada**

Canadian health policies and programs set in a comparative political-economic and institutional context. Also offered at the undergraduate level, with different requirements, as PADM 4221, for which additional credit is precluded.

**PADM 5222 [0.5 credit]****Economics and Health Policy**

This course applies microeconomic theory to a discussion of health policy. Focus on issues of particular interest to a student of Canadian health care policy.

Prerequisite(s): PADM 5127 or equivalent.

**PADM 5223 [0.5 credit]****Canadian Economic Policy**

Overview of Canadian economic development and how it has been affected by governments. Topics may be drawn from monetary, fiscal, industrial, trade, labour market or competition policies, viewed in contemporary and historical contexts.

Prerequisite(s): PADM 5128 or equivalent.

**PADM 5224 [0.5 credit]****Indigenous Policy**

Canadian policies and programs on Indigenous peoples and Indigenous peoples' own policies as nations set in a comparative political-economic and institutional context. Precludes additional credit for PADM 5711, PADM 4806 (no longer offered) and PADM 5806 (no longer offered). Also offered at the undergraduate level, with different requirements, as PADM 4224, for which additional credit is precluded.

**PADM 5225 [0.5 credit]****Trade Policy**

Canadian multilateral and regional trade policies and programs set in a comparative political-economic and institutional context.

Prerequisite(s): PADM 5127 or equivalent.

Also offered at the undergraduate level, with different requirements, as PADM 4225, for which additional credit is precluded.

**PADM 5226 [0.5 credit]****Tax Policy**

Canadian tax policies set in a comparative political-economic and institutional context.

Prerequisite(s): PADM 5127 or equivalent.

Also offered at the undergraduate level, with different requirements, as PADM 4226, for which additional credit is precluded.

**PADM 5227 [0.5 credit]****Education Policy**

Canadian policies and programs on education set in a comparative political-economic and institutional context. Also offered at the undergraduate level, with different requirements, as PADM 4227, for which additional credit is precluded.

**PADM 5228 [0.5 credit]****Social Policy**

The nature and historical development of social programs in capitalist countries, with particular focus on Canada.

The course will concentrate on developing a critical understanding of the social forces shaping these programs.

Also offered at the undergraduate level, with different requirements, as PADM 4228, for which additional credit is precluded.

**PADM 5229 [0.5 credit]****The Health of Populations**

Assessment of the medical model, and perspectives on the social and economic determinants of health, population health, and community health. The health of particular groups in Canada (e.g., women, Aboriginal peoples). International comparisons will be made.

**PADM 5230 [0.5 credit]****Ethics for Public Policy**

The development and application of ethical theories to examine not simply what governments could do, but what they should do on the basis of consequences, principles, or motivations. Applications could include policies affecting climate change, income inequality, end of life, privacy, use of force.

Also offered at the undergraduate level, with different requirements, as PADM 4230, for which additional credit is precluded.

**PADM 5291 [0.5 credit]****Directed Studies**

A tutorial or directed reading course on selected subjects related to policy analysis.

**PADM 5372 [0.5 credit]****Policy Seminar (Data Science Specialization)**

One or more selected policy areas and topics related to policy and administration in the data science context. Topics will change each year.

**PADM 5391 [0.5 credit]****Directed Studies (Data Science Specialization)**

A tutorial of directed reading on selected subjects related to data science.

**PADM 5411 [0.5 credit]****Organization Theory**

Focusing on major theoretical approaches to organizations, the course develops practical insights into issues such as organizational design, leadership, technology, culture and diversity, motivation and power. It applies these insights to organizations in both the public and private sectors in a variety of national contexts.

**PADM 5415 [0.5 credit]****Strategic Management in the Public Sector**

Key concepts, principles and tools of strategic management, and their use in planning and policy implementation in the public sector. Reviews critical perspectives and cases in order to identify some of the limitations of strategic management. Includes: Experiential Learning Activity

**PADM 5416 [0.5 credit]****Budgetary Management for the Public Sector**

Theory and practice of budgeting in the public sector. From a management perspective, the course focuses on the objectives, methods and systems for the control and reporting of expenditures.

**PADM 5418 [0.5 credit]****Human Resources Management**

The field of human resources management including the roles of human resource departments, employee motivation, staffing, compensation, benefits, training and development and employee relations.

**PADM 5419 [0.5 credit]****Industrial Relations and Public Sector Collective Bargaining**

The basic concepts of industrial relations, with respect to both public and private sector employees and organizations.

**PADM 5420 [0.5 credit]****Policy and Program Evaluation**

Selected concepts, issues, and processes in applied governmental planning and evaluation, utilizing both Canadian and comparative experiences.

**PADM 5422 [0.5 credit]****Urban and Local Government**

The role of municipal government in the context of Canadian federalism. Current economic, political and social trends affecting Canada's major urban centres including growth, amalgamation, fiscal reform, immigration, housing, community engagement, and sustainable development.

**PADM 5423 [0.5 credit]****Third Sector Governance and Management**

Governance and management of voluntary/nonprofit organizations and their role in democracy, public policy, and service delivery.

**PADM 5441 [0.5 credit]****Introduction to Policy and Program Evaluation**

Survey of evaluation in Canada and internationally. Topics include: Canadian context for public sector evaluation practice; approaches to research in evaluation; essentials of effective evaluation design, including logic modeling, theories of change/action, and contribution/attribution constructs.

**PADM 5442 [0.5 credit]****Quantitative Research Methods in Evaluation**

Descriptive and inferential statistics, probability theory and sampling distributions, hypothesis testing of quantitative and qualitative population parameters, and regression analysis as these apply to the field of program evaluation.

**PADM 5443 [0.5 credit]****Qualitative Research Methods in Evaluation**

Methods used in qualitative evaluation research. Topics include: formulating evaluation research questions; deriving research designs from questions; qualitative data gathering techniques and approaches; managing evidence, ethics reviews, and analysis of qualitative data.

**PADM 5444 [0.5 credit]****Benefit-Cost Analysis for Program Evaluation**

Approaches to benefit-cost analysis in the Canadian evaluation context. Topics include: the role of benefit-cost analysis within program evaluation; its application to public sector investments, pricing and other forms of policy valuation; discount rates, marginal cost, and shadow pricing; risk and uncertainty.

**PADM 5445 [0.5 credit]****Program Evaluation Planning and Designs**

Application of specific evaluation research designs to actual projects. Topics include: designs for formative, summative and developmental programs; designs for policy evaluation; attribution and contribution analysis; applied logic modeling; and managing evaluation projects at the planning stages.

Includes: Experiential Learning Activity

Prerequisite(s): PADM 5441, PADM 5442, PADM 5443, PADM 5444.

**PADM 5446 [0.5 credit]**  
**Program Evaluation Conduct, Analysis and Reporting**

Application of evaluation conduct to actual projects. Topics include: selecting data analysis methods specific to a project; forming evaluation findings and recommendations; data visualization; reporting techniques; and management of evaluation projects at the conduct stages.

Includes: Experiential Learning Activity

**PADM 5510 [0.5 credit]**  
**Energy Economics**

Micro- and macroeconomic concepts and techniques applied to such topics as international energy markets, energy production, and energy consumption.

**PADM 5511 [0.5 credit]**  
**Energy Management**

The fundamentals of energy management, focusing on current practices in both private and public sector organizations.

**PADM 5512 [0.5 credit]**  
**International Politics of Sustainable Energy**  
Recent historical and contemporary developments in the role of energy in inter- and intranational relations, involving such topics as Canada/US relations, the international political economy of oil, energy security, and climate change.

**PADM 5515 [0.5 credit]**  
**Sustainable Energy Policy**  
The institutions involved in energy policy, the processes through which policy is made, and the substantive energy-related issues currently preoccupying policy makers. Precludes additional credit for PADM 5615.

**PADM 5572 [0.5 credit]**  
**Policy Seminar (Sustainable Energy)**  
One or more selected topics or specialized aspects of sustainable energy policy. The topic will change each year.

**PADM 5611 [0.5 credit]**  
**Science and Technology Policies**  
Theory and practice regarding governmental policies for science and technology, and the use of scientific knowledge in the policy and regulatory processes of government. Concerns regarding the ethical issues and the transparency of science in government. Also offered at the undergraduate level, with different requirements, as PADM 4611, for which additional credit is precluded.

**PADM 5612 [0.5 credit]**  
**Industrial Policy, Innovation and Sustainable Production**  
Sustainable production theory and key drivers, barriers and opportunities influencing innovation in industrial systems and processes. The relationship of public policies and industry practices are explored in a number of sectors.

Also offered at the undergraduate level, with different requirements, as PADM 4612, for which additional credit is precluded.

**PADM 5614 [0.5 credit]**  
**Natural Resource Management**  
Governance and management of natural resources from a Canadian and international perspective. The use of various management instruments, regulatory approaches and community-based and co-management institutions are evaluated with evidence from several case studies from around the world.

**PADM 5615 [0.5 credit]**  
**Politics and Policy of Energy in Canada**  
Dilemmas associated with energy policy in Canada. Economic, social and environmental dimensions of energy decision making; Canadian issues within the context of a changing international scene and long term energy transitions. Precludes additional credit for PADM 5515. Also offered at the undergraduate level, with different requirements, as PADM 4615, for which additional credit is precluded.

**PADM 5616 [0.5 credit]**  
**Environmental Policy**  
Canadian environmental policies and programs set in a comparative political-economic and institutional context. Also offered at the undergraduate level, with different requirements, as PADM 4616, for which additional credit is precluded.

**PADM 5618 [0.5 credit]**  
**Environmental and Ecological Economics**  
Environmental and ecological economics with applications to public policy and environmental management issues. Concepts of sustainability, non-market valuation and ecological stability, the determination of environmental targets, and the use of policy instruments, incentives and emissions markets. Prerequisite(s): PADM 5127 or equivalent.

**PADM 5619 [0.5 credit]****Urban Sustainability**

Impact of economic growth and social change on cities and their attempts to forge sustainable growth. Incorporating political and fiscal issues, the focus is on 'smart growth' policies and initiatives in areas such as environmental control, transport, land use, housing and infrastructure.

**PADM 5620 [0.5 credit]****The Science, Politics and Economics of Global Climate Change**

Scientific issues at the core of climate change and the domestic and international policy responses. Various environmental, economic, and political implications for both the developed and developing worlds and for the various regions of Canada.

**PADM 5702 [0.5 credit]****Policy Seminars****PADM 5703 [0.5 credit]****Directed Studies (Indigenous Public Administration)**

A tutorial or directed reading course on selected subjects.

**PADM 5711 [0.5 credit]****Indigenous-Canada Relations: Governance and Policy History**

Introduction to pre-contact history of select Indigenous nations and peoples, overview of contact period: the treaty relationship, evolving jurisprudence, changing power dynamics, federal and provincial administrative practices, contemporary and traditional forms of First Nations, Métis and Inuit governance. Contrasting approaches to understanding foundational events.

Includes: Experiential Learning Activity

Precludes additional credit for PADM 5224.

**PADM 5712 [0.5 credit]****Issues in Contemporary Governance: First Nations, Métis and Inuit**

Diverse approaches to understanding and responding to the main governance issues facing contemporary and traditional First Nations, Inuit and Métis governments and organizations in Ontario and in the rest of Canada.

**PADM 5713 [0.5 credit]****Public Administration in Indigenous Organizations and Governments**

Principles and processes of public administration relevant to Indigenous contexts and governments. Topics may include comparative government, federalism, Canadian constitutionalism, citizenship, leadership, and select topics in public policy. Includes a practicum.

Includes: Experiential Learning Activity

**PADM 5714 [0.5 credit]****Financial Management in First Nations, Métis and Inuit Governments and Organizations**

Legislation, regulations, and financial management practices that apply in First Nations, Métis, Inuit organizations and governments. Sources and measures to mitigate and eliminate historical disparity, including asset management, strategic investment, and capital aggregation.

**PADM 5715 [0.5 credit]****Policy Research and Evaluation for Indigenous Policy and Administration**

Policy research and program evaluation; applied research ethics, cultural and community protocols, legal frameworks, formulation of research problems, research design, and techniques for collecting and managing community-based and other data; research methodologies of specific Indigenous nations and peoples, and scholarly debates about epistemology and practice.

Precludes additional credit for PADM 5125.

**PADM 5716 [0.5 credit]****Economic and Community Development in Indigenous Territories**

Community economic development theories; the ethics, benefits and costs of traditional, current and new approaches pertinent to building stable economies in rural and urban Aboriginal settings.

Includes: Experiential Learning Activity

**PADM 5719 [0.5 credit]****Indigenous Health and Social Policy**

Development and delivery of health and social policies pertinent to Indigenous peoples living in diverse circumstances in Canada; theories and practices.

**PADM 5772 [0.5 credit]****Policy Seminar (Indigenous Policy and Administration)**

One or more selected policy areas or specialized aspects of Indigenous Policy and Administration. The policy field or topic will change each year.

**PADM 5814 [0.5 credit]****Program and Project Management**

The context, critical issues and methods relating to the planning and implementation of development programs and projects.

**PADM 5815 [0.5 credit]****Civil Society Organizations and Development**

The context, roles, structures and strategies of nongovernmental organizations in the development process at the global, national and local levels. The role of development aid and NGOs is considered.

Also listed as IDMG 5615.

**PADM 5817 [0.5 credit]****Health Policy in Developing Countries**

Debates regarding health policy in the developing world, in the context of the global health sector reform movement, trade and intellectual property regimes, and strategies of corporate and NGO actors. Issues of gender, class and the determinants of health.

Also listed as IDMG 5617.

Also offered at the undergraduate level, with different requirements, as PADM 4817, for which additional credit is precluded.

**PADM 5908 [1.0 credit]****Research Essay**

Includes: Experiential Learning Activity

**PADM 5909 [2.0 credits]****M.P.P.A. Thesis**

Includes: Experiential Learning Activity

**PADM 5913 [0.0 credit]****Co-operative Work Term**

Includes: Experiential Learning Activity

Prerequisite(s): registration in the Co-operative Education Option of the M.A. program and permission of the Co-op Supervisor.

**PADM 6010 [0.5 credit]****Current Issues in Public Policy**

Current issues in Canadian public policy, their historical contexts, and interdisciplinary approaches to analyzing them. Issues may include inequality, gender, environment, Indigenous governance, US/Canada relations, populism. Approaches to analysis may include contemporary and classic thinkers.

Precludes additional credit for PADM 6114 (no longer offered).

**PADM 6011 [0.5 credit]****Theoretical Foundations of Public Policy**

Normative and explanatory theories fundamental to public policy, drawing on multiple social science disciplines and incorporating ethical, economic, and political/administrative perspectives. Topics may include utilitarianism, rights-based traditions, contractualism, market failure, life-course dynamics.

Precludes additional credit for PADM 6111(no longer offered).

**PADM 6012 [0.5 credit]****Policy Process and Institutions**

Various theoretical approaches to policy-making.

Topics may include policy formation, agenda-setting, institutionalism, theories of the bureau, theories of policy change, policy design and implementation, policy evaluation, advocacy and coalitions, private policy-making.

Precludes additional credit for PADM 6112(no longer offered).

**PADM 6013 [0.5 credit]****Research Design for Public Policy**

Introduction to the analytical challenges to the study of public policy, and ways of addressing them. Exploration of why particular explanatory, interpretive and normative research questions are asked; and why particular theories, units of analysis, concepts, methods and data are used. Precludes additional credit for PADM 6113 (no longer offered).

**PADM 6200 [0.5 credit]****Doctoral Research Seminar**

Issues in developing research proposals and conducting public policy research; includes research presentations by senior doctoral students and faculty. Required for second-year doctoral students who present their thesis proposals. Issues surrounding quantitative or qualitative methods in public policy analysis may be discussed. Graded Pass/Fail.

**PADM 6201 [0.5 credit]****Doctoral Research Seminar**

Presentations on research skills and strategies such as ethics approval, bibliographic software, work-flow management, subsequent publication. Supervised independent research projects preliminary to Ph.D. Thesis, drawing upon interdisciplinary approaches to study of public policy. Graded SAT/UNS.

Precludes additional credit for PADM 6200.

Prerequisite(s): PADM 6900.

**PADM 6900 [0.5 credit]****Ph.D. Comprehensive Examination**

Ph.D. preparation for the comprehensive examination. The grade to be awarded will be that obtained on the comprehensive examination.

**PADM 6901 [0.5 credit]****Ph.D. Specialization Tutorial**

A Ph.D. tutorial covering advanced theory and research in an area of specialization generally related to public policy. Specific topics will be selected in consultation with, and must be approved by, the academic supervisor and Ph.D. co-ordinator.

**PADM 6902 [0.5 credit]****Ph.D. Specialization Tutorial**

A Ph.D. tutorial covering advanced theory and research in an area of specialization generally related to public policy. Specific topics will be selected in consultation with, and must be approved by, the academic supervisor and Ph.D. co-ordinator.

**PADM 6909 [0.0 credit]****Ph.D. Thesis**

A thorough investigation of a public policy issue that integrates multiple disciplines into the analysis. Includes: Experiential Learning Activity  
Prerequisite(s): successful public defence of written thesis proposal.

**PADM 6911 [0.0 credit]****Ph.D. Proposal**

Under the direction of thesis (co-)supervisor, development of a research proposal that will guide the Ph.D. thesis research investigation. Concludes with public defence of written thesis proposal.  
Prerequisite(s): PADM 6900 and PADM 6201.

## Information Technology

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This section presents the requirements for programs in:

- **M.A.Sc. Digital Media**
- **M.A.Sc. Digital Media with Collaborative Specialization in Cybersecurity**
- **M.A.Sc. Digital Media with Collaborative Specialization in Data Science**
- **M.A.Sc. Networking Technology**
- **M.A.Sc. Networking Technology with Collaborative Specialization in Cybersecurity**
- **Master of Networking Technology**
- **Master of Networking Technology with Collaborative Specialization in Cybersecurity**
- **Ph.D. Information Technology**

**Program Requirements****M.A.Sc. Digital Media (5.0 credits)****Requirements:**

<b>1. 0.0 credit in:</b>		
ITEC 5001 [0.0]	Information Technology Seminars	
<b>2. 2.0 credits from</b> core courses (For students admitted to 4.0-credit program, 1.0 credit):		2.0
ITEC 5002 [0.5]	Fundamentals of Information Technology Research	
ITEC 5010 [0.5]	Applied Programming I	
ITEC 5200 [0.5]	Entertainment Technologies	
ITEC 5201 [0.5]	Computer Animation Technologies	
ITEC 5202 [0.5]	Visual Effects Technologies	
ITEC 5203 [0.5]	Game Design and Development Technologies	
ITEC 5204 [0.5]	Emerging Interaction Techniques	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5206 [0.5]	Data Protection and Rights Management	
ITEC 5207 [0.5]	Data Interaction Techniques	
ITEC 5208 [0.5]	Virtual Reality and 3D User Interfaces	
ITEC 5209 [0.5]	Empirical Research Methods in HCI	
ITEC 5920 [0.5]	Special Topics in Digital Media	
<b>3. 0.5 credit in</b> electives, which may include up to 0.5 credit from a 4000-level course, or a 0.5 credit graduate course from another discipline, with permission from their graduate supervisor or the Associate Director of Graduate Studies in the School.		0.5
<b>5. 2.5 credits in:</b>		2.5
ITEC 5909 [2.5]	Master's Thesis	
<b>Total Credits</b>		<b>5.0</b>

**M.A.Sc. Digital Media  
with Collaborative Specialization in  
Cybersecurity (5.0 credits)**
**Requirements:**

<b>1. 1.0 credit in:</b>		1.0
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 0.0 credit in:</b>		

ITEC 5001 [0.0]	Information Technology Seminars	
<b>3. 1.5 credit from</b>	core courses:	1.5
ITEC 5002 [0.5]	Fundamentals of Information Technology Research	
ITEC 5200 [0.5]	Entertainment Technologies	
ITEC 5201 [0.5]	Computer Animation Technologies	
ITEC 5202 [0.5]	Visual Effects Technologies	
ITEC 5203 [0.5]	Game Design and Development Technologies	
ITEC 5204 [0.5]	Emerging Interaction Techniques	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5206 [0.5]	Data Protection and Rights Management	
ITEC 5207 [0.5]	Data Interaction Techniques	
ITEC 5208 [0.5]	Virtual Reality and 3D User Interfaces	
ITEC 5209 [0.5]	Empirical Research Methods in HCI	
ITEC 5920 [0.5]	Special Topics in Digital Media	
<b>5. 2.5 credits in:</b>		2.5
ITEC 5909 [2.5]	Master's Thesis (in the specialization)	

**Total Credits** **5.0**

### M.A.Sc. Digital Media with Collaborative Specialization in Data Science (5.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		0.5
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.5 credit from</b>	core courses:	1.5
ITEC 5002 [0.5]	Fundamentals of Information Technology Research	
ITEC 5010 [0.5]	Applied Programming I	
ITEC 5200 [0.5]	Entertainment Technologies	
ITEC 5201 [0.5]	Computer Animation Technologies	
ITEC 5202 [0.5]	Visual Effects Technologies	
ITEC 5203 [0.5]	Game Design and Development Technologies	
ITEC 5204 [0.5]	Emerging Interaction Techniques	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5206 [0.5]	Data Protection and Rights Management	
ITEC 5207 [0.5]	Data Interaction Techniques	
ITEC 5208 [0.5]	Virtual Reality and 3D User Interfaces	
ITEC 5209 [0.5]	Empirical Research Methods in HCI	
ITEC 5920 [0.5]	Special Topics in Digital Media	
<b>4. 0.5 credit in</b>	electives, which may include up to 0.5 credit from a 4000-level course, or a 0.5 credit graduate course from another discipline, with permission from their graduate supervisor or the Associate Director of Graduate Studies in the School.	0.5
<b>5. 2.5 credits in:</b>		2.5
ITEC 5909 [2.5]	Master's Thesis (in the specialization)	

**Total Credits** **5.0**

**Note:** No additional IT seminar requirements for this stream.

### M.A.Sc. Networking Technology (5.0 credits)

#### Requirements:

<b>1. 0.0 credit in:</b>		
ITEC 5001 [0.0]	Information Technology Seminars	
<b>2. 1.5 credits from</b>	core courses (For students admitted to 4.0-credit program, 1.0 credit):	1.5
ITEC 5100 [0.5]	Planning and Design of Computer Networks	
ITEC 5101 [0.5]	Cross Layer Design for Wireless Multimedia Networks	
ITEC 5102 [0.5]	Designing Secure Networking and Computer Systems	
ITEC 5103 [0.5]	Cloud and Datacentre Networking	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5910 [0.5]	Special Topics in Network Technologies	
<b>3. 1.0 credit in</b>	electives at the 5000-level, chosen in consultation with your graduate advisor/supervisor or the Associate Director of Graduate Studies in the School.	1.0
<b>4. 2.5 credits in:</b>		2.5
ITEC 5909 [2.5]	Master's Thesis	

**Total Credits** **5.0**

### M.A.Sc. Networking Technology with Collaborative Specialization in Cybersecurity (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>		1.0
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 0.0 credit in:</b>		
ITEC 5001 [0.0]	Information Technology Seminars	
<b>3. 1.0 credit from</b>	core courses:	1.0
ITEC 5100 [0.5]	Planning and Design of Computer Networks	
ITEC 5101 [0.5]	Cross Layer Design for Wireless Multimedia Networks	
ITEC 5102 [0.5]	Designing Secure Networking and Computer Systems	
ITEC 5103 [0.5]	Cloud and Datacentre Networking	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5910 [0.5]	Special Topics in Network Technologies	
<b>4. 0.5 credits in</b>	electives at the 5000-level, chosen in consultation with your graduate advisor/supervisor or the Associate Director Graduate Study in the School.	0.5
<b>5. 2.5 credits in:</b>		2.5
ITEC 5909 [2.5]	Master's Thesis (in the area of the specialization)	

**Total Credits** **5.0**

### Master of Networking Technology (5.0 credits)

#### Requirements:

<b>1. 0.0 credit in:</b>		
ITEC 5001 [0.0]	Information Technology Seminars	

<b>2. 2.5 credits from</b> core courses:		2.5
ITEC 5100 [0.5]	Planning and Design of Computer Networks	
ITEC 5101 [0.5]	Cross Layer Design for Wireless Multimedia Networks	
ITEC 5102 [0.5]	Designing Secure Networking and Computer Systems	
ITEC 5103 [0.5]	Cloud and Datacentre Networking	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5910 [0.5]	Special Topics in Network Technologies	
<b>3. 2.5 credits in</b> electives at the 5000-level, chosen in consultation with your graduate advisor/supervisor or the Associate Director of Graduate Studies in the School.		2.5

**Total Credits** **5.0**

### Master of Networking Technology with Collaborative Specialization in Cybersecurity (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>		1.0
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 0.0 credit in:</b>		
ITEC 5001 [0.0]	Information Technology Seminars	
<b>3. 2.0 credits from</b> core courses:		2.0
ITEC 5100 [0.5]	Planning and Design of Computer Networks	
ITEC 5101 [0.5]	Cross Layer Design for Wireless Multimedia Networks	
ITEC 5102 [0.5]	Designing Secure Networking and Computer Systems	
ITEC 5103 [0.5]	Cloud and Datacentre Networking	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5910 [0.5]	Special Topics in Network Technologies	
<b>4. 0.5 credit in</b> the area of the specialization, approved by the graduate supervisor or the Associate Director of Graduate Studies in the School.		0.5
<b>5. 1.5 credits in</b> electives at the 5000-level, chosen in consultation with your graduate advisor/supervisor or the Associate Director of Graduate Studies in the School.		1.5

**Total Credits** **5.0**

### Ph.D. Information Technology (1.5 credits)

#### Requirements:

<b>1. 1.5 credits in</b> ITEC courses, approved by the graduate supervisor. May include up to 0.5 credit in another discipline, with approval from the graduate supervisor.		1.5
<b>2. 0.0 credit in:</b>		0.0
ITEC 5001 [0.0]	Information Technology Seminars	
<b>3. 0.0 credit in:</b>		0.0
ITEC 6907 [0.0]	Doctoral Qualifying Examination	
<b>4. 0.0 credit in:</b>		0.0
ITEC 6908 [0.0]	Doctoral Proposal	
<b>5. 0.0 credit in:</b>		
ITEC 6909 [0.0]	Doctoral Thesis	

**Total Credits** **1.5**

### Milestones

#### For full-time students:

**First Year:** completion of ITEC 6907 [0.0] before the end of the third term of registration.

**Third Year:** completion of ITEC 6908 [0.0] before the end of the ninth term of registration.

#### For part-time students:

Completion of ITEC 6907 [0.0] before the end of the fifth term of registration, and completion of ITEC 6908 [0.0] by the end of the thirteenth term of registration.

### Regulations

See the General Regulations section of this Calendar.

#### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the Master of Networking Technology is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### Admission

#### M.A.Sc. Digital Media

Students entering the program will have an undergraduate degree in one of the related three primary disciplines of Technology (e.g. Computer Science/Engineering and Information Technology), Content (e.g. Arts and Humanities), and People (e.g. Psychology, Communication and Business).

All students will apply for the 5.0 credit M.A.Sc. Digital Media.

Applicants with substantial professional experience in digital media in Canada may be considered for admission to professional entry, requiring them to complete 4.0 credits, to be determined by the School of Information Technology and Graduate Studies.

#### Accelerated Pathway Digital Media

The accelerated pathway in the M.A.Sc. Digital Media is a flexible and individualized plan of graduate study. Students in their final year of any relevant Carleton undergrad degree with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third or fourth year of study in the relevant degree should consult with both their Academic Advisor and the CSIT Associate Director for Graduate Studies to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

#### Accelerated Pathway Requirements:

1. At least 0.5 credit in one of the following courses ITEC 52XX or ITEC 5920 with a grade of B+ or higher;
2. Minimum overall CGPA of A-.

Students may receive advanced standing with transfer of up to 1.0 credit, which can reduce their time to completion. *Students presenting a demonstrated research ability (e.g. primary author of a research report), supported by the proposed thesis supervisor, and approved by the CSIT Associate Director for Graduate Studies, may be eligible to receive credit for ITEC 5002 [0.5 credit] Fundamentals of Information Technology Research.*

### Admission

#### Networking Technology - M.A.Sc., M.N.T.

Students entering the program will have an undergraduate degree in network technology, electrical engineering, computer science, engineering, or a closely-related discipline.

All students will apply for either the 5.0 credit M.A.Sc. or the M.N.T.

Applicants with substantial professional experience in network technology in Canada may be considered for admission to professional entry, requiring them to complete 4.0 credits, to be determined by the School of Information Technology and Graduate Studies.

#### Accelerated Pathway Networking Technology

The accelerated pathway in the M.A.Sc. Networking Technology and M. Networking Technology is a flexible and individualized plan of graduate study. Students in their final year of any relevant Carleton undergrad degree with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third or fourth year in the relevant degree should consult with both their Undergraduate Program Coordinator and the CSIT Associate Director for Graduate Studies to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

#### Accelerated Pathway Requirements:

1. At least 0.5 credit from: ITEC 5110, ITEC 5111, ITEC 5112, ITEC 5113, ITEC 5114 with a grade of B+ or higher;
2. Minimum overall CGPA of A-.

Students may receive advanced standing with transfer of up to 1.0 credit, which can reduce their time to completion. *Students presenting a demonstrated research ability (e.g. primary author of a research report), supported by the proposed thesis supervisor, and approved by the CSIT Associate Director for Graduate Studies, may be eligible to receive credit for ITEC 5002 [0.5 credit] Fundamentals of Information Technology Research.*

### Admission

Applicants to this program will normally hold a Master's degree in one of the three related disciplines (Technology, Content, and People) but demonstrate the ability to work in multi-disciplinary groups and have some general technology (digital media) background.

Applicants judged to be generally acceptable but deficient in some preparation may be asked to complete course work in addition to the program requirements.

In addition to transcripts and letters of reference, application packages will include a statement of interest outlining the applicant's proposed area of research.

### Information Technology (ITEC) Courses

#### ITEC 5001 [0.0 credit]

##### Information Technology Seminars

A seminar based course where the students make the presentations and participate in discussions. Some seminars done by guest lecturers. Graded Sat/Uns. Includes: Experiential Learning Activity

#### ITEC 5002 [0.5 credit]

##### Fundamentals of Information Technology Research

Basic concepts and techniques in information technology, including information systems, algorithms and software development process, research methods, and research and technical writing.

Includes: Experiential Learning Activity

Precludes additional credit for ITEC 5000 (no longer offered).

#### ITEC 5010 [0.5 credit]

##### Applied Programming I

Algorithm design and computer programming with practical industry problems in information technology. Topics include algorithms and pseudocode, programming fundamentals, memory operations, data structures, object oriented programming, program design, testing and debugging.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the graduate supervisor.

#### ITEC 5100 [0.5 credit]

##### Planning and Design of Computer Networks

Planning process of computer networks; needs and technical requirements; modeling of different network planning problems; exact and approximate algorithms; topological planning and expansion problems; equipment (switch, router) location problem; approximate and optimal routing algorithms; presentation of various case studies.

Includes: Experiential Learning Activity

#### ITEC 5101 [0.5 credit]

##### Cross Layer Design for Wireless Multimedia Networks

Quality of service measures at different layers. Parameter adaptation, trade-offs, and optimization at physical, data-link, network, transport, and application layers. Cross-layer design in cellular, ad hoc, sensor, local area, green, and cognitive radio networks.

**ITEC 5102 [0.5 credit]**  
**Designing Secure Networking and Computer Systems**

Network security with coverage of computer security in support of networking concepts. Security issues in data networks at different protocol layers. Routing security, worm attacks, and botnets. Security of new mobile networks and emerging networked paradigms such as social networks and cloud computing.

**ITEC 5103 [0.5 credit]**  
**Cloud and Datacentre Networking**

Special issues of the networking requirements in datacentres and cloud computing environments. Performance, power requirements, redundancy of datacentre networks.

**ITEC 5110 [0.5 credit]**  
**Emerging Network Technologies**

Overview of technologies, protocols and techniques related to Information Technology networking that are either in their early stage of adoption or are not yet mainstream (i.e. beta or prototype stage). Focus will vary from year to year to reflect the evolutionary nature of this domain.

Prerequisite(s): permission of the graduate supervisor.  
Also offered at the undergraduate level, with different requirements, as NET 4000, for which additional credit is precluded.

**ITEC 5111 [0.5 credit]**  
**Multimedia Networking**

Audio and video compression. H.261, JPEG, MPEG and DVI. Accessing audio and video from a web server. Real Time Streaming Protocol (RTSP). Multimedia operating systems. Multimedia database. Network support for multimedia applications. Multimedia synchronization. Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4007, for which additional credit is precluded.

**ITEC 5112 [0.5 credit]**  
**Secure Mobile Networking**

The concept, principle and rationale of mobile networking. Mobile network architecture, protocols, mobility management, routing and mobile TCP/IP; Security challenges, vulnerabilities and threats in mobile networks; Security defense techniques and countermeasures in mobile networks.

Prerequisite(s): permission of the graduate supervisor.  
Also offered at the undergraduate level, with different requirements, as NET 4010, for which additional credit is precluded.

**ITEC 5113 [0.5 credit]**  
**Network Simulation**

Introduction to discrete event simulation; fundamental stochastic models for networking; queueing theory; deterministic algorithms for networking; confidence intervals; introduction to network modeling. Simulation exercises including traffic monitoring, congestion, routing protocols, resource utilization and growth planning using OPNET simulation tool.

Includes: Experiential Learning Activity  
Prerequisite(s): permission of the graduate supervisor.  
Also offered at the undergraduate level, with different requirements, as NET 4001, for which additional credit is precluded.

**ITEC 5114 [0.5 credit]**  
**Networked Applications**

Architectures for computing in modern data networks that adopt the Internet architecture. Topics covered include socket programming, RPC and RMI. Client-server and peer-to-peer models. Emerging application architectures. Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4005, for which additional credit is precluded.

**ITEC 5200 [0.5 credit]**  
**Entertainment Technologies**

Advanced topics in entertainment technologies which may include web-based, film and television, video games and/or interactive systems.

**ITEC 5201 [0.5 credit]**  
**Computer Animation Technologies**

Advanced topics in computer animation: full body motion capture, space-time systems, physics-based animation, realistic rendering techniques, industry methods for large scene animations and live action integration; behavioural animation.

**ITEC 5202 [0.5 credit]**  
**Visual Effects Technologies**

Advanced look at the processes and technologies in visual effects, specifically in advanced processing of virtual sets (e.g. using chroma-keying), lighting and colour integration, filming technologies, motion tracking, and the integration of 3D objects/elements into real scenes.

**ITEC 5203 [0.5 credit]**  
**Game Design and Development Technologies**

Advanced technologies in the development of computer game systems and gameplay experiences, focused on Procedural Content Generation. Automatic or semi-automatic methods for producing game levels, objects, characters, and narratives.

**ITEC 5204 [0.5 credit]****Emerging Interaction Techniques**

Advanced interaction styles and their associated technologies. Topics may include hand held and gestural interactions, ubiquitous computing, deformable user interfaces, physiological computing and tangible user interfaces.

Also listed as HCIN 5300.

**ITEC 5205 [0.5 credit]****Design and Development of Data-Intensive Applications**

Design and development of data-intensive applications dealing with large-scale data. Data may include spatial data, time series, text, social media and different forms of digital media. Data modeling and management techniques will be discussed that enhance data analysis techniques and improve data-intensive applications.

**ITEC 5206 [0.5 credit]****Data Protection and Rights Management**

Understanding how to use technology to implement data privacy, security, protection and related legal issues. Insights on how to develop systems for managing digital rights, data privacy rules, laws or policies relevant to different jurisdictions, rights, and responsibilities for protecting data and personal information.

Precludes additional credit for DATA 5002.

**ITEC 5207 [0.5 credit]****Data Interaction Techniques**

Design and development of how humans (e.g., end-users, knowledge-users and expert-users) interact with data ecosystem like data collection, storage, analysis and visualization. Techniques, methods and tools will be discussed on how humans interact with data based on capabilities of machines and needs of humans.

**ITEC 5208 [0.5 credit]****Virtual Reality and 3D User Interfaces**

Research in and design of virtual reality and 3D systems. Applications, history, human factors, display and input hardware, and interaction techniques for navigation, selection and manipulation. Students develop and evaluate a VR or 3D system using game engines and devices such as head-mounted displays.

Includes: Experiential Learning Activity

Also listed as HCIN 5501.

**ITEC 5209 [0.5 credit]****Empirical Research Methods in HCI**

Advanced quantitative methods and conducting controlled user studies, statistically analyzing and reporting results in a research paper. Topics include history of empirical HCI, experiment design, hypothesis testing, interaction models, and scientific writing. Students complete a term-long research project.

Includes: Experiential Learning Activity

Also listed as HCIN 5407.

Also offered at the undergraduate level, with different requirements, as ITEC 4021, for which additional credit is precluded.

**ITEC 5900 [0.5 credit]****Directed Studies**

A course of independent study that fits the student's area of interest under the supervision of a faculty member of the School.

**ITEC 5909 [2.5 credits]****Master's Thesis**

Includes: Experiential Learning Activity

**ITEC 5910 [0.5 credit]****Special Topics in Network Technologies**

Recent and advanced topics in network technologies. Trends in wireless networking, software defined networks, power-line networking. Students may be expected to contribute to lectures or seminars.

**ITEC 5920 [0.5 credit]****Special Topics in Digital Media**

Recent and advanced topics in Digital Media. Students may be expected to contribute to lectures or seminars.

**ITEC 6200 [0.5 credit]****Introduction to Interdisciplinary Research in Information Technology**

Introduction to concepts and practices for research in Information Technology. Understanding the defining properties of computer-based systems and related technologies. Emphasis on bringing together skills related to technology, people and content in order to solve problems and explore new possibilities.

**ITEC 6900 [0.5 credit]****Directed Studies**

A course of independent study that fits the student's area of interest under the supervision of a faculty member of the School.

**ITEC 6907 [0.0 credit]****Doctoral Qualifying Examination**

Ph.D. qualifying examination in the student's field.

The exam consists of a written submission and an oral examination.

**ITEC 6908 [0.0 credit]****Doctoral Proposal**

Ph.D. thesis proposal. Defending a proposal consists of a written submission and an oral examination.

Prerequisite(s): ITEC 6907 and permission of the School.

**ITEC 6909 [0.0 credit]****Doctoral Thesis**

Includes: Experiential Learning Activity

Prerequisite(s): ITEC 6908 and permission of the School.

**ITEC 6920 [0.5 credit]****Selected Topics in Digital Media**

Recent and advanced topics in Digital Media. Students are expected to contribute to lectures or seminars.

## Infrastructure Protection and International Security

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This section presents the requirements for programs in:

- **M.Eng. Infrastructure Protection and International Security**
- **M.Eng. Infrastructure Protection and International Security with Collaborative Specialization in Cybersecurity**
- **M. Infrastructure Protection and International Security**
- **M. Infrastructure Protection and International Security with Collaborative Specialization in Cybersecurity**
- **Graduate Diploma in Infrastructure Protection and International Security**

**Program Requirements****M.Eng. Infrastructure Protection and International Security (5.0 credits)****Requirements - Research project pathway:**

<b>1. 1.5 credits in:</b>		<b>1.5</b>
IPIS 5101 [0.5]	Critical Infrastructure Protection: Issues and Strategies	
IPIS 5105 [0.5]	Critical Infrastructure Risk Assessment	
IPIS 5106 [0.5]	Management of Critical Infrastructure	
<b>2. 1.0 credit from:</b>		<b>1.0</b>
IPIS 5104 [0.5]	Terrorism and International Security	
IPIS 5301 [0.5]	Disarmament, Arms Control and Nonproliferation	
IPIS 5302 [0.5]	Contemporary International Security	
IPIS 5303 [0.5]	Intelligence Statecraft and International Affairs	
IPIS 5304 [0.5]	Intelligence and National Security: Policies and Operations	
IPIS 5305 [0.5]	National Security Policy and Law	
IPIS 5306 [0.5]	Emergency and Business Continuity Management	
IPIS 5320 [0.5]	Topics in Infrastructure Security Policy	
Or 5000-level courses from the Intelligence and International Affairs (IIA) and Security Defence Policy (SDP) designated fields offered by the Norman Paterson School of International Affairs.		
<b>3. 1.5 credit from:</b>		<b>1.5</b>
IPIS 5501 [0.5]	Transportation and Aviation Security	
IPIS 5504 [0.5]	Fundamentals of Fire Safety	
IPIS 5505 [0.5]	Natural Hazards in Canada: Risk and Impact	
IPIS 5507 [0.5]	Blast Load Effects on Structures	
IPIS 5508 [0.5]	Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components	
IPIS 5509 [0.5]	Introduction to Cybersecurity	

IPIS 5520 [0.5]	Selected Topics in Engineering of Critical Infrastructure	
or an engineering course approved by the IPIS Director or Associate Director.		
<b>4. 1.0 credit in:</b>		<b>1.0</b>
IPIS 5907 [1.0]	Research Project (in the area of the specialization)	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Coursework pathway:</b>		
<b>1. 1.5 credits in:</b>		<b>1.5</b>
IPIS 5101 [0.5]	Critical Infrastructure Protection: Issues and Strategies	
IPIS 5105 [0.5]	Critical Infrastructure Risk Assessment	
IPIS 5106 [0.5]	Management of Critical Infrastructure	
<b>2. 1.0 credit from:</b>		<b>1.0</b>
IPIS 5104 [0.5]	Terrorism and International Security	
IPIS 5301 [0.5]	Disarmament, Arms Control and Nonproliferation	
IPIS 5302 [0.5]	Contemporary International Security	
IPIS 5303 [0.5]	Intelligence Statecraft and International Affairs	
IPIS 5304 [0.5]	Intelligence and National Security: Policies and Operations	
IPIS 5305 [0.5]	National Security Policy and Law	
IPIS 5306 [0.5]	Emergency and Business Continuity Management	
IPIS 5320 [0.5]	Topics in Infrastructure Security Policy	
Or 5000-level courses from the Intelligence and International Affairs (IIA) and Security Defence Policy (SDP) designated fields offered by the Norman Paterson School of International Affairs.		
<b>3. 1.5 credit from:</b>		<b>1.5</b>
IPIS 5501 [0.5]	Transportation and Aviation Security	
IPIS 5504 [0.5]	Fundamentals of Fire Safety	
IPIS 5505 [0.5]	Natural Hazards in Canada: Risk and Impact	
IPIS 5507 [0.5]	Blast Load Effects on Structures	
IPIS 5508 [0.5]	Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components	
IPIS 5509 [0.5]	Introduction to Cybersecurity	
IPIS 5520 [0.5]	Selected Topics in Engineering of Critical Infrastructure	
or an engineering course approved by the IPIS Director or Associate Director.		
<b>4. 1.0 credit from</b>	graduate courses from the Faculty of Engineering and Design that have been selected in consultation with, and approved by, the MIPIS Director and Associate Director.	<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>

## M.Eng. Infrastructure Protection and International Security with Collaborative Specialization in Cybersecurity (5.0 credits)

### Requirements - Research project pathway:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 1.5 credits in:</b>		<b>1.5</b>
IPIS 5101 [0.5]	Critical Infrastructure Protection: Issues and Strategies	
IPIS 5105 [0.5]	Critical Infrastructure Risk Assessment	
IPIS 5106 [0.5]	Management of Critical Infrastructure	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
IPIS 5104 [0.5]	Terrorism and International Security	
IPIS 5301 [0.5]	Disarmament, Arms Control and Nonproliferation	
IPIS 5302 [0.5]	Contemporary International Security	
IPIS 5303 [0.5]	Intelligence Statecraft and International Affairs	
IPIS 5304 [0.5]	Intelligence and National Security: Policies and Operations	
IPIS 5305 [0.5]	National Security Policy and Law	
IPIS 5306 [0.5]	Emergency and Business Continuity Management	
IPIS 5320 [0.5]	Topics in Infrastructure Security Policy	

Or 5000-level courses from the Intelligence and International Affairs (IIA) and Security Defence Policy (SDP) designated fields offered by the Norman Paterson School of International Affairs.

<b>4. 1.0 credit from:</b>		<b>1.0</b>
IPIS 5501 [0.5]	Transportation and Aviation Security	
IPIS 5504 [0.5]	Fundamentals of Fire Safety	
IPIS 5505 [0.5]	Natural Hazards in Canada: Risk and Impact	
IPIS 5507 [0.5]	Blast Load Effects on Structures	
IPIS 5508 [0.5]	Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components	
IPIS 5509 [0.5]	Introduction to Cybersecurity	
IPIS 5520 [0.5]	Selected Topics in Engineering of Critical Infrastructure	

or an engineering course approved by the IPIS Director or Associate Director.

<b>5. 1.0 credit in:</b>		<b>1.0</b>
IPIS 5907 [1.0]	Research Project (in the area of the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### Requirements - Coursework pathway:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 1.5 credits in:</b>		<b>1.5</b>

IPIS 5101 [0.5]	Critical Infrastructure Protection: Issues and Strategies	
IPIS 5105 [0.5]	Critical Infrastructure Risk Assessment	
IPIS 5106 [0.5]	Management of Critical Infrastructure	
<b>3. 1.0 credit from:</b>		1.0
IPIS 5104 [0.5]	Terrorism and International Security	
IPIS 5301 [0.5]	Disarmament, Arms Control and Nonproliferation	
IPIS 5302 [0.5]	Contemporary International Security	
IPIS 5303 [0.5]	Intelligence Statecraft and International Affairs	
IPIS 5304 [0.5]	Intelligence and National Security: Policies and Operations	
IPIS 5305 [0.5]	National Security Policy and Law	
IPIS 5306 [0.5]	Emergency and Business Continuity Management	
IPIS 5320 [0.5]	Topics in Infrastructure Security Policy	
Or 5000-level courses from the Intelligence and International Affairs (IIA) and Security Defence Policy (SDP) designated fields offered by the Norman Paterson School of International Affairs.		
<b>4. 1.0 credit from:</b>		1.0
IPIS 5501 [0.5]	Transportation and Aviation Security	
IPIS 5504 [0.5]	Fundamentals of Fire Safety	
IPIS 5505 [0.5]	Natural Hazards in Canada: Risk and Impact	
IPIS 5507 [0.5]	Blast Load Effects on Structures	
IPIS 5508 [0.5]	Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components	
IPIS 5509 [0.5]	Introduction to Cybersecurity	
IPIS 5520 [0.5]	Selected Topics in Engineering of Critical Infrastructure	
or an engineering course approved by the IPIS Director or Associate Director.		
<b>5. 0.5 credit in</b> approved electives in the area of the specialization		
<b>6. 0.5 credit from</b> graduate courses from the Faculty of Engineering and Design that have been selected in consultation with, and approved by, the MIPIS Director and Associate Director.		0.5
<b>Total Credits</b>		<b>5.0</b>

## M. Infrastructure Protection and International Security (5.0 credits)

### Requirements:

<b>1. 2.0 credits in:</b>		2.0
IPIS 5101 [0.5]	Critical Infrastructure Protection: Issues and Strategies	
IPIS 5103 [0.5]	Infrastructure Engineering Principles	
IPIS 5105 [0.5]	Critical Infrastructure Risk Assessment	
IPIS 5106 [0.5]	Management of Critical Infrastructure	
<b>2. 1.0 credit from:</b>		1.0

IPIS 5104 [0.5]	Terrorism and International Security	
IPIS 5301 [0.5]	Disarmament, Arms Control and Nonproliferation	
IPIS 5302 [0.5]	Contemporary International Security	
IPIS 5303 [0.5]	Intelligence Statecraft and International Affairs	
IPIS 5304 [0.5]	Intelligence and National Security: Policies and Operations	
IPIS 5305 [0.5]	National Security Policy and Law	
IPIS 5306 [0.5]	Emergency and Business Continuity Management	
IPIS 5320 [0.5]	Topics in Infrastructure Security Policy	
Or 5000-level courses from the IIA or SDP designated fields offered by the Norman Paterson School of International Affairs.		
<b>3. 1.0 credit from:</b>		1.0
IPIS 5501 [0.5]	Transportation and Aviation Security	
IPIS 5504 [0.5]	Fundamentals of Fire Safety	
IPIS 5505 [0.5]	Natural Hazards in Canada: Risk and Impact	
IPIS 5507 [0.5]	Blast Load Effects on Structures	
IPIS 5508 [0.5]	Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components	
IPIS 5509 [0.5]	Introduction to Cybersecurity	
IPIS 5520 [0.5]	Selected Topics in Engineering of Critical Infrastructure	
<b>4. 1.0 credit normally comprised of</b> courses with CIVE, INAF or IPIS course designations, but may also be chosen from related programs that have been selected in consultation with, and approved by, the MIPIS Director and Associate Director and associated faculty when necessary.		1.0
<b>Total Credits</b>		<b>5.0</b>

## M. Infrastructure Protection and International Security with Collaborative Specialization in Cybersecurity (5.0 credits)

### Requirements:

<b>1. 1.0 credit in:</b>		1.0
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	
<b>2. 2.0 credits in:</b>		2.0
IPIS 5101 [0.5]	Critical Infrastructure Protection: Issues and Strategies	
IPIS 5103 [0.5]	Infrastructure Engineering Principles	
IPIS 5105 [0.5]	Critical Infrastructure Risk Assessment	
IPIS 5106 [0.5]	Management of Critical Infrastructure	
<b>3. 1.0 credit from:</b>		1.0
IPIS 5104 [0.5]	Terrorism and International Security	
IPIS 5301 [0.5]	Disarmament, Arms Control and Nonproliferation	
IPIS 5302 [0.5]	Contemporary International Security	

IPIS 5303 [0.5]	Intelligence Statecraft and International Affairs	
IPIS 5304 [0.5]	Intelligence and National Security: Policies and Operations	
IPIS 5305 [0.5]	National Security Policy and Law	
IPIS 5306 [0.5]	Emergency and Business Continuity Management	
IPIS 5320 [0.5]	Topics in Infrastructure Security Policy	
Or 5000-level courses from the IIA or SDP designated fields offered by the Norman Paterson School of International Affairs.		
<b>4. 0.5 credit from:</b>		<b>0.5</b>
IPIS 5501 [0.5]	Transportation and Aviation Security	
IPIS 5504 [0.5]	Fundamentals of Fire Safety	
IPIS 5505 [0.5]	Natural Hazards in Canada: Risk and Impact	
IPIS 5507 [0.5]	Blast Load Effects on Structures	
IPIS 5508 [0.5]	Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components	
IPIS 5509 [0.5]	Introduction to Cybersecurity	
IPIS 5520 [0.5]	Selected Topics in Engineering of Critical Infrastructure	
<b>5. 0.5 credit in</b> elective in the area of the specialization, selected in consultation with, and approved by, the MIPIS Director and Associate Director and associated faculty when necessary.		<b>0.5</b>
<b>Total Credits</b>		<b>5.0</b>

## Graduate Diploma in Infrastructure Protection and International Security (3.0 credits)

### Type 2 (Concurrent), Type 3 (Direct Entry)

#### Requirements:

<b>1. 1.5 credits in:</b>		<b>1.5</b>
IPIS 5101 [0.5]	Critical Infrastructure Protection: Issues and Strategies	
IPIS 5105 [0.5]	Critical Infrastructure Risk Assessment	
IPIS 5106 [0.5]	Management of Critical Infrastructure	
<b>2. 1.0 credit from</b> electives:		<b>1.0</b>
IPIS 5104 [0.5]	Terrorism and International Security	
IPIS 5301 [0.5]	Disarmament, Arms Control and Nonproliferation	
IPIS 5302 [0.5]	Contemporary International Security	
IPIS 5303 [0.5]	Intelligence Statecraft and International Affairs	
IPIS 5304 [0.5]	Intelligence and National Security: Policies and Operations	
IPIS 5305 [0.5]	National Security Policy and Law	
IPIS 5320 [0.5]	Topics in Infrastructure Security Policy	
IPIS 5501 [0.5]	Transportation and Aviation Security	
IPIS 5504 [0.5]	Fundamentals of Fire Safety	
IPIS 5505 [0.5]	Natural Hazards in Canada: Risk and Impact	

IPIS 5507 [0.5]	Blast Load Effects on Structures	
IPIS 5508 [0.5]	Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components	
IPIS 5520 [0.5]	Selected Topics in Engineering of Critical Infrastructure	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
<b>a) for students without a B.Eng. in Civil Engineering (or equivalent):</b>		
IPIS 5103 [0.5]	Infrastructure Engineering Principles	
<b>b) for students with a B.Eng. in Civil Engineering (or equivalent):</b>		
0.5 additional credit from electives in Item 2 above		
<b>Total Credits</b>		<b>3.0</b>

## Regulations

See the General Regulations section of this Calendar.

## Co-operative Education

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

## Application Requirements

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

## Participation Requirements

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.
- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

## Co-op Participation Agreement

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

### Communication with the Co-op Office

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

### Graduation with the Co-op Designation

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

### Employment

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

### Work Term Assessment and Evaluation

#### Work Term Evaluation

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

#### Work Term Assessment

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

#### Voluntary Withdrawal from the Co-op Option

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

#### Involuntary or Required Withdrawal from the Co-op Option

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### International Students

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

### Co-op Fees

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

### Infrastructure Protection and International Security MIPIS

#### Co-operative Education Option

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the Master of Infrastructure Protection and International Security or the Master of Engineering Infrastructure Protection and International Security;
2. have successfully completed, by the end of their first term of academic study, at least 1.5 credits toward the M.IPIS or the M.Eng IPIS;
3. have successfully completed, by the start-date of the first work term, a total of 3.0 credits toward the M.IPIS or the M.Eng IPIS, 1.5 of which must be core compulsory credits and IPIS 5002 or IPIS 5003, as required;
4. be registered as a full-time student in each academic term prior to a work term;
5. be eligible to work in Canada (for off-campus work terms)

For more information, please refer to the Co-operative Education Policy.

### Admission Requirements

Proficiency in English is necessary to pursue graduate studies at Carleton University. All applicants whose first language is not English must satisfy this requirement as per the General Regulations.

#### M. Infrastructure Protection and International Security

The minimum requirement for admission into the M. I.P.I.S. is a B.A. Honours degree in a discipline related to International Affairs or a Bachelor's degree in Science or Engineering. Students will normally be expected to have a B+ average (or higher) to be considered for admission.

Students without a background in engineering or science will be required to complete IPIS 5003 [0.0] Mathematics and Engineering Primer for non-Engineers, which will be

in addition to the regular degree requirements and is to be completed in the first fall term in which the student is registered. IPIS 5003 is a prerequisite for the required course in Infrastructure Engineering Principles, and for other engineering electives.

### **M. Eng. Infrastructure Protection and International Security**

The minimum requirement for admission into the M.Eng. I.P.I.S. is a B.Eng. degree or equivalent. Students will normally be expected to have a B+ average (or higher) to be considered for admission.

Students without a background in the social sciences or policy work in the Canadian context will be required to complete IPIS 5002 [0.0] , which will be in addition to the regular degree requirements and is to be completed in the first fall term in which the student is registered.

#### **Accelerated Pathway**

The accelerated pathway to the Master of Infrastructure Protection and International Security and the Master of Engineering in Infrastructure Protection and International Security is a flexible and individualized plan of graduate study for students in their final year of a Carleton undergraduate degree in a related discipline.

Students in their third year of study in their undergraduate program who are interested in the accelerated pathway should consult with the Director and Associate Director in the I.P.I.S. Program to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses and Honours project/thesis supervisor for their final year of undergraduate studies.

#### **Accelerated Pathway Requirements**

1. IPIS courses at the 5000-level with a grade of B+ or higher
2. Minimum overall CGPA of A-

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### **Infrastructure Protection and International Security (IPIS) Courses**

#### **IPIS 5003 [0.0 credit]**

##### **Mathematics and Engineering Primer for non-Engineers**

Review and application of basic mathematics, physics and engineering principles required to prepare non-engineers and other students without a previous background in mathematics for the required course in Infrastructure Engineering Principles and other engineering courses.

#### **IPIS 5101 [0.5 credit]**

##### **Critical Infrastructure Protection: Issues and Strategies**

Examines critical infrastructure, its interdependencies, vulnerabilities, and security requirements; intentional and natural risks; policy responses to threat and vulnerability assessments; risk management approaches, prevention and protective security, emergency management and damage mitigation measures; continuity of critical operations and resilience planning.

Prerequisite(s): Registration in the G.Dip (IPIS), M.IPIS or M.Eng (IPIS) degrees or permission of the Infrastructure Protection and International Security Program.

#### **IPIS 5103 [0.5 credit]**

##### **Infrastructure Engineering Principles**

Introduction to infrastructure engineering: civil, municipal/environmental, energy, communications, and military infrastructure systems; engineering principles; design, analysis and construction techniques; lifecycle performance, maintenance and retrofit strategies; optimization, asset-management; decision-making and decision support tools.

Prerequisite(s): Registration in the G.Dip (IPIS), M.IPIS or M.Eng (IPIS) degrees or permission of the Infrastructure Protection and International Security Program.

#### **IPIS 5104 [0.5 credit]**

##### **Terrorism and International Security**

Contemporary international terrorism in comparative perspective; religious and ideological parameters motivating terrorism; sociology of recruitment and participation; evolving structure and dynamics of terror networks; terrorism finance, operations and related activities; impact of counter-terrorism measures; examples are drawn from international and domestic terrorism. Also listed as INAF 5244.

#### **IPIS 5105 [0.5 credit]**

##### **Critical Infrastructure Risk Assessment**

Risk-assessment techniques and methodologies relevant for the identification of threats. Assessment of vulnerabilities and evaluating the impact on infrastructures or systems considering the probability of such threats being realized.

Prerequisite(s): Registration in the G.Dip (IPIS), M.IPIS or M.Eng (IPIS) degrees or permission of the Infrastructure Protection and International Security Program.

**IPIS 5106 [0.5 credit]****Management of Critical Infrastructure**

Management of critical infrastructure (CI) and its relationship to facility and asset management; asset maintenance, rehabilitation, and restoration; tools, systems and approaches to effective CI management, integration and linkages across CI and consequent challenges to managers of critical infrastructure systems. Prerequisite(s): Registration in the G.Dip (IPIS), M.IPIS or M.Eng (IPIS) degrees or permission of the Infrastructure Protection and International Security Program.

**IPIS 5301 [0.5 credit]****Disarmament, Arms Control and Nonproliferation**

Origins, theory and practice, with a focus on so-called weapons of mass destruction and current controversies. Emphasis on treaty negotiation and implementation, including monitoring, verification, facilitation and enforcement of compliance. Also listed as INAF 5201.

**IPIS 5302 [0.5 credit]****Contemporary International Security**

The evolving strategic and security environment since the end of the Cold War, encompassing both traditional and non-traditional concepts. Topics include hegemonism; the rise of new powers; terrorism; multilateralism; human security; and new security threats, including climate change. Also listed as INAF 5202.

**IPIS 5303 [0.5 credit]****Intelligence Statecraft and International Affairs**

The role of intelligence in foreign and security policy after the Cold War. Evolution of intelligence as regards strategic and policy requirements, the capabilities of selected services, interactions within government and civil society. Emphasis on the structure and functions of Canada's intelligence community. Also listed as INAF 5204.

**IPIS 5304 [0.5 credit]****Intelligence and National Security: Policies and Operations**

The roles and activities of intelligence services of selected countries. Their performance will be assessed in the light of historical experience, and in the context of the policy, legal and ethical constraints. Also listed as INAF 5224.

**IPIS 5305 [0.5 credit]****National Security Policy and Law**

The international legal and policy implications of identifying and responding to national security threats. Topics include: intelligence gathering; verification regimes; military and counter-terrorism operations; criminal prosecution; and, balancing human rights and security concerns. Also listed as INAF 5234.

**IPIS 5306 [0.5 credit]****Emergency and Business Continuity Management**

The disciplines of emergency management and business continuity, their interaction, and how they provide complementary contributions to critical infrastructure protection and resilience. A focus on Canada and Canadian Standards is supplemented by consideration of broader international approaches and contexts. Precludes additional credit for IPIS 5320 taken before Winter 2021. Prerequisite(s): Registration in the M.IPIS or M.Eng(IPIS) degrees or permission of the Infrastructure Protection and International Security Program.

**IPIS 5320 [0.5 credit]****Topics in Infrastructure Security Policy**

Courses in special topics related to infrastructure security, not covered by other graduate courses; course topics will be available prior to registration.

**IPIS 5501 [0.5 credit]****Transportation and Aviation Security**

Canadian Public Security Strategy and Transportation System security environment; Civil Aviation security and operations: trends, impacts, and implications of evolving policies, operations, and technologies; security vulnerabilities in the transportation system; transportation of hazardous materials; secure movements on roads, highways and railways.

**IPIS 5504 [0.5 credit]****Fundamentals of Fire Safety**

The fire safety system; social, economic and environmental issues; description of the fire safety regulatory system and the governing building codes and standards. This includes the global fire safety system in a facility and active fire protection systems; detection, suppression, smoke management. Precludes additional credit for CIVE 5609.

**IPIS 5505 [0.5 credit]****Natural Hazards in Canada: Risk and Impact**

Earthquakes and ground motion, tsunamis, landslides, liquefaction; soil properties for ground response analysis; laboratory tests, in-situ tests; dams and embankments, slope stability, seismic effects on slope stability, retaining structures.

Also listed as EARTH 5215.

**IPIS 5507 [0.5 credit]****Blast Load Effects on Structures**

Threats, risk analysis, vulnerability assessment; explosives: types and mechanisms; load determination; response of structural elements under blast loads, analysis and design for blast loads; blast mitigation, retrofit of structures; post-event assessment.

Also listed as CIVE 5507.

Prerequisite(s): those enrolled in the M.IPIS program must have prior knowledge of structural steel and reinforced concrete design, typically obtained through the completion of an undergraduate engineering degree.

**IPIS 5508 [0.5 credit]****Introduction to Explosives and Explosion Effects as they relate to Infrastructure and its Components**

Properties and effects of explosives, propellants and pyrotechnics, detonation, deflagration and consequence of confinement, commercial and military applications including areas of terrorism and entertainment, sensitivities and hazards in transport, storage and use, specialized charges, explosion effects and indicators, and bombings and accident investigations.

Precludes additional credit for IPIS 5520.

**IPIS 5509 [0.5 credit]****Introduction to Cybersecurity**

Introductory cyber security principles with an emphasis on critical infrastructure protection. Basic concepts in computer networking, including: local and remote access, cloud computing, vulnerability identification and threat assessment, attack methodologies and exposed access points, access control and authentication.

Precludes additional credit for IPIS 5520 taken before January 2021.

Prerequisite(s): Registration in the M.IPIS or M.Eng(IPIS) degrees or permission of the Infrastructure Protection and International Security Program.

**IPIS 5520 [0.5 credit]****Selected Topics in Engineering of Critical Infrastructure**

Courses in special topics related to infrastructure security, not covered by other graduate courses; course topics will be available prior to registration.

**IPIS 5901 [0.5 credit]****Tutorials in Infrastructure Protection and International Security**

To be selected in consultation with Director and/or Associate Director.

**IPIS 5907 [1.0 credit]****Research Project**

Students may be given permission to undertake an approved research project that will conduct a study, analysis or design project that relates to the protection and security of infrastructure under the general supervision of an engineer approved by the MIPIS Director or Graduate Supervisor.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the MIPIS Program Director or Graduate Supervisor.

**IPIS 5908 [1.0 credit]****Research Paper**

Students may be given permission to conduct independent research under the general guidance of a research supervisor, examining an approved policy-relevant topic that integrates the infrastructure, engineering and security elements of their program of study.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the MIPIS Program Director or Graduate Supervisor.

**IPIS 5913 [0.0 credit]****Co-operative Work Term**

Includes: Experiential Learning Activity

Prerequisite(s): Full-time M. IPIS or M. Eng IPIS students who have completed a minimum of three classes (1.5 credits) in each of their first two terms, including 1.5 credits in core compulsory courses, and IPIS 5002 or IPIS 5003 as required are eligible for registration in their third term. Eligibility for registration in subsequent co-op terms requires the successful completion of all core program requirements.

## International Affairs

This section presents the requirements for programs in:

- **M.A. International Affairs**
- **M.A. International Affairs with Collaborative Specialization in African Studies**
- **M.A. International Affairs with Collaborative Specialization in Climate Change**
- **M.A. International Affairs with Collaborative Specialization in Cybersecurity**
- **M.A. International Affairs with Collaborative Specialization in Data Science**
- **M.A. International Affairs with Collaborative Specialization in Latin American and Caribbean Studies**
- **Ph.D. International Affairs**
- **Ph.D. International Affairs with Collaborative Specialization in African Studies**

### Program Requirements

#### M.A. International Affairs (5.0 credits)

##### Full-time program requirements

Students admitted to the full-time program must complete all of the degree requirements within two calendar years or six terms of full-time study. Students admitted into the full-time program are expected to continue to register as full-time students until completion of their program. The program may be completed within one calendar year, though it normally takes at least four terms of full-time study.

A minimum of 1.5 credits must normally be completed in each of the first two terms of full-time study, including the mandatory program courses.

All courses used for credit in the degree must be approved in advance by the M.A. Program Supervisor.

##### Requirements - Thesis pattern (5.0 credits)

###### 1. 1.5 credits in: 1.5

INAF 5015 [0.5] Research Design and Methods for International Affairs

INAF 5016 [0.5] Statistical Analysis for International Affairs

INAF 5017 [0.25] International Policymaking in Canada: Structure and Process

INAF 5018 [0.25] Law and International Affairs

###### 2. 0.5 credit in economics, successfully completed by the end of the second term, from (See Note 1, below): 0.5

INAF 5009 [0.5] International Aspects of Economic Development

INAF 5205 [0.5] Economics of Conflict

INAF 5214 [0.5] Economics for Defence and Security

INAF 5221 [0.5] Economics of Security and Intelligence

INAF 5308 [0.5] International Trade: Theory and Policy

INAF 5309 [0.5] International Finance: Theory and Policy

INAF 5600 [0.5] The Economics of Human Development

INAF 5703 [0.5] International Public Economics

###### 3. 1.0 credit in Field and Elective courses (See Note 2, below) 1.0

###### 4. 2.0 credits in: 2.0

INAF 5909 [2.0] M.A. Thesis

5. Successful completion of second language proficiency examination (see Note 3, below)

**Total Credits 5.0**

##### Requirements - Research Essay pattern (5.0 credits)

###### 1. 1.5 credit in: 1.5

INAF 5015 [0.5] Research Design and Methods for International Affairs

INAF 5016 [0.5] Statistical Analysis for International Affairs

INAF 5017 [0.25] International Policymaking in Canada: Structure and Process

INAF 5018 [0.25] Law and International Affairs

###### 2. 0.5 credit in economics, successfully completed by the end of the second term, from (See Note 1, below): 0.5

INAF 5009 [0.5] International Aspects of Economic Development

INAF 5205 [0.5] Economics of Conflict

INAF 5214 [0.5] Economics for Defence and Security

INAF 5221 [0.5] Economics of Security and Intelligence

INAF 5308 [0.5] International Trade: Theory and Policy

INAF 5309 [0.5] International Finance: Theory and Policy

INAF 5600 [0.5] The Economics of Human Development

INAF 5703 [0.5] International Public Economics

###### 3. 2.0 credits in Field and Elective courses (See Notes 1 and 2, below) 2.0

###### 4. 1.0 credit in: 1.0

INAF 5908 [1.0] Research Essay

5. Successful completion of second language proficiency examination (see Note 3, below)

**Total Credits 5.0**

##### Requirements - Coursework pattern (5.0 credits)

###### 1. 1.0 credit in: 1.0

INAF 5016 [0.5] Statistical Analysis for International Affairs

INAF 5017 [0.25] International Policymaking in Canada: Structure and Process

INAF 5018 [0.25] Law and International Affairs

###### 2. 0.5 credit in economics, successfully completed by the end of the second term, from: (See Note 1, below) 0.5

INAF 5009 [0.5] International Aspects of Economic Development

INAF 5205 [0.5] Economics of Conflict

INAF 5214 [0.5] Economics for Defence and Security

INAF 5221 [0.5] Economics of Security and Intelligence

INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
3. 3.5 credits of Field and Elective courses (See Notes 1 and 2, below)		3.5
4. Successful completion of second language proficiency examination (see Note 3, below)		
<b>Total Credits</b>		<b>5.0</b>

#### Notes:

1. All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309, or approved equivalent, must be completed in order to receive the field designation.
2. If students choose to complete by Research Essay or Thesis, 0.5 credit will be applied towards the field designation. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.
3. Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies.

#### Fields

NPSIA's M.A. program includes eight fields. Each field has at least one designated economics course and a set of designated field courses. Each student is admitted into a field and receives priority in the required economics course and in any three of the non-shared designated field courses. Students who complete the required economics course and three designated field courses may receive a field concentration designation on their academic transcript and diploma. Students who choose not to complete the requirements of any given field may still graduate with a general M.A. in International Affairs without a field designation. Courses marked with an asterisk (\*) are shared courses with limited enrolment; students in the field may claim such courses towards their field concentration but do not have priority for the limited space in those courses.

Students who already have a graduate or senior undergraduate economics course that is deemed to be the equivalent of the required economics course for their field must take another economics course from the School. Students with economics courses similar to those offered by the school must see the M.A. Program Supervisor to determine which economics course they should be taking.

The fields are:

#### International Economic Policy

Provides a foundation in basic international economic theory and examines policy questions and applications to institutional arrangements in areas of trade, foreign direct investment, finance, international economic law, and other international economic relations.

Note: students admitted in the IEP field will be exempt from taking one or both of the field-required economics courses (INAF 5308 and INAF 5309) if they have previously completed an equivalent one. They will receive advanced standing without transfer of credits for those courses and will replace them with alternative economics courses from NPSIA or another department (fourth year and up), selected with the approval of the M.A. Program Supervisor on the basis of their relevance to the chosen program of study.

Required economics courses: INAF 5308 and INAF 5309 or equivalent.

#### Designated Courses:

INAF 5101 [0.5]	The Politics and Institutions of International Trade
INAF 5300 [0.5]	Foreign Direct Investment: Theory and Policy
INAF 5306 [0.5]	Trade Policy in North America
INAF 5312 [0.5]	The Practice of Trade Negotiations
INAF 5400 [0.5]	Trade Policy Analysis
INAF 5401 [0.5]	International Financial Institutions and Policy
INAF 5410 [0.5]	Global Public Policy
INAF 5459 [0.5]	Selected Topics in International Economic Policy
INAF 5501 [0.5]	Global Political Economy
INAF 5502 [0.5]	State Sovereignty and Globalization
INAF 5507 [0.5]	International Economic Law: Regulation of Trade and Investment *
INAF 5711 [0.5]	International Labour Migration

#### Conflict Analysis and Conflict Resolution

Examines causes and dynamics of interstate and intrastate peace and conflict, explores theoretical and practical dimensions of the prevention, management and resolution of international and civil wars, disputes and crises.

Required economics course: INAF 5205

#### Designated Courses:

INAF 5108 [0.5]	Conflict Analysis
INAF 5109 [0.5]	Conflict Management: Theory and Evidence
INAF 5200 [0.5]	Peacebuilding and Reconstruction: Theory and Practice
INAF 5202 [0.5]	Contemporary International Security
INAF 5203 [0.5]	International Mediation and Conflict Resolution
INAF 5209 [0.5]	Conflict and Development
INAF 5218 [0.5]	Post-Conflict Justice: Theory and Practice
INAF 5219 [0.5]	Rights, Development, and Conflict *

INAF 5305 [0.5]	International Bargaining and Negotiation: Theory and Practice
INAF 5429 [0.5]	Selected Topics in Diplomacy and Foreign Policy
INAF 5449 [0.5]	Selected Topics in Conflict Analysis and Resolution
INAF 5506 [0.5]	International Law: Use of Force *
INAF 5710 [0.5]	Global Governance of Displacement

## Security and Defence Policy

Examines the core theories, concepts, challenges and controversies in security and defence studies in the context of applied policy issues such as national security, defence policy, civil-military relations, foreign policy, and proliferation of weapons.

Required economics course: INAF 5214.

### Designated Courses:

INAF 5108 [0.5]	Conflict Analysis	0.5
INAF 5201 [0.5]	Disarmament, Arms Control and Nonproliferation	0.5
INAF 5202 [0.5]	Contemporary International Security	0.5
INAF 5206 [0.5]	Civil-Military Relations	0.5
INAF 5208 [0.5]	U.S. Foreign and Security Policy	0.5
INAF 5210 [0.5]	Technology and War	0.5
INAF 5211 [0.5]	Comparative Defence Policy	0.5
INAF 5212 [0.5]	Issues in War and Defence Studies	0.5
INAF 5228 [0.5]	Espionage and Foreign Influence	0.5
INAF 5234 [0.5]	National Security Policy and Law	0.5
INAF 5254 [0.5]	Capstone in Canadian Security Policy	0.5
INAF 5439 [0.5]	Selected Topics in Security and Defence Policy	0.5
INAF 5506 [0.5]	International Law: Use of Force	0.5

## Intelligence and International Affairs

Examines the function, limits and impact of intelligence collection and analysis in foreign and international security policy, using both theoretical and practical approaches.

Required economics course: INAF 5221

### Designated Courses:

INAF 5204 [0.5]	Intelligence and International Affairs	0.5
INAF 5220 [0.5]	Intelligence Analysis	0.5
INAF 5223 [0.5]	Counterterrorism	0.5
INAF 5224 [0.5]	Intelligence and National Security	0.5
INAF 5225 [0.5]	Cybersecurity in Canada	0.5
INAF 5226 [0.5]	Cyber Warfare	0.5
INAF 5228 [0.5]	Espionage and Foreign Influence	0.5
INAF 5234 [0.5]	National Security Policy and Law *	0.5
INAF 5244 [0.5]	Terrorism and International Security	0.5
INAF 5254 [0.5]	Capstone in Canadian Security Policy	0.5
INAF 5301 [0.5]	Strategic Foresight in International Security	0.5
INAF 5411 [0.5]	Internet Governance	0.5
INAF 5469 [0.5]	Selected Topics in Intelligence and International Affairs	0.5

## International Organizations and Global Public Policy

Examines the role of states and other policy actors in addressing global policy problems. Global governance for policy problems encompasses international law, the formal UN system of international organizations as well as more ad hoc approaches with a greater role for nonstate actors. Specific policy issues analyzed include the environment and public health.

Required economics course: INAF 5703.

### Designated Courses:

INAF 5101 [0.5]	The Politics and Institutions of International Trade
INAF 5201 [0.5]	Disarmament, Arms Control and Nonproliferation
INAF 5306 [0.5]	Trade Policy in North America
INAF 5312 [0.5]	The Practice of Trade Negotiations
INAF 5401 [0.5]	International Financial Institutions and Policy
INAF 5405 [0.5]	International Organizations in International Affairs
INAF 5410 [0.5]	Global Public Policy
INAF 5411 [0.5]	Internet Governance
INAF 5479 [0.5]	Selected Topics in International Organizations and Global Public Policy
INAF 5501 [0.5]	Global Political Economy
INAF 5502 [0.5]	State Sovereignty and Globalization
INAF 5504 [0.5]	Advanced International Law: Principles and Practice
INAF 5612 [0.5]	International Development Institutions
INAF 5701 [0.5]	Global Environmental Change: Human Implications
INAF 5702 [0.5]	International Environmental Affairs
INAF 5705 [0.5]	Global Social Policy
INAF 5706 [0.5]	Global Health Policy
INAF 5711 [0.5]	International Labour Migration

## International Development Policy

Examines the difficulties faced by poor and developing countries and the policy responses that have emerged at the international level, including development assistance, international institutions and regional cooperation.

Required economics course: INAF 5009 or equivalent.

### Designated Courses:

INAF 5002 [0.5]	International Development Policy
INAF 5006 [0.5]	Food Security and Rural Development
INAF 5007 [0.5]	Theories of Development and Underdevelopment
INAF 5209 [0.5]	Conflict and Development *
INAF 5219 [0.5]	Rights, Development, and Conflict
INAF 5489 [0.5]	Selected Topics in International Development Policy
INAF 5602 [0.5]	Development Assistance: Theory and Practice
INAF 5603 [0.5]	Issues in Development in Africa
INAF 5604 [0.5]	Issues in Development in Latin America

INAF 5609 [0.5]	Development Project Evaluation and Analysis *
INAF 5610 [0.5]	Fragile States: Theory and Policy *
INAF 5612 [0.5]	International Development Institutions
INAF 5705 [0.5]	Global Social Policy
INAF 5706 [0.5]	Global Health Policy
INAF 5711 [0.5]	International Labour Migration

## Health, Displacement and Humanitarian Policy

Examines global health challenges and humanitarian crises, including refugees and displacement, analyses how these issues impact socio-economic development and security, and assesses international responses.

Required economics course: INAF 5600 or equivalent.

### Designated courses:

INAF 5006 [0.5]	Food Security and Rural Development
INAF 5200 [0.5]	Peacebuilding and Reconstruction: Theory and Practice
INAF 5203 [0.5]	International Mediation and Conflict Resolution
INAF 5219 [0.5]	Rights, Development, and Conflict
INAF 5408 [0.5]	Gender in International Affairs
INAF 5499 [0.5]	Selected Topics in Health, Displacement and Humanitarian Policy
INAF 5602 [0.5]	Development Assistance: Theory and Practice
INAF 5603 [0.5]	Issues in Development in Africa
INAF 5604 [0.5]	Issues in Development in Latin America
INAF 5609 [0.5]	Development Project Evaluation and Analysis
INAF 5610 [0.5]	Fragile States: Theory and Policy
INAF 5704 [0.5]	Human Security: From Policy to Practice
INAF 5706 [0.5]	Global Health Policy
INAF 5707 [0.5]	Complex Humanitarian Emergencies
INAF 5708 [0.5]	Humanitarian Assistance: Policies and Issues
INAF 5710 [0.5]	Global Governance of Displacement
INAF 5714 [0.5]	Global Health Security

## Diplomacy and Foreign Policy

Examines the theory, legal framework and practice of diplomacy and foreign policy, and analyzes the statecraft of Canada and major world powers, as well as regional inter-state relations.

Required economics course: INAF 5009, INAF 5308, INAF 5309, or INAF 5703 or equivalent.

INAF 5100 [0.5]	Canada in International Affairs	0.5
INAF 5201 [0.5]	Disarmament, Arms Control and Nonproliferation	0.5
INAF 5203 [0.5]	International Mediation and Conflict Resolution	0.5
INAF 5207 [0.5]	Middle East Economic and Political Relations	0.5
INAF 5208 [0.5]	U.S. Foreign and Security Policy	0.5

INAF 5305 [0.5]	International Bargaining and Negotiation: Theory and Practice	0.5
INAF 5306 [0.5]	Trade Policy in North America	0.5
INAF 5312 [0.5]	The Practice of Trade Negotiations	0.5
INAF 5403 [0.5]	Diplomacy and Foreign Policy: Theory and Practice	0.5
INAF 5405 [0.5]	International Organizations in International Affairs	0.5
INAF 5410 [0.5]	Global Public Policy	0.5
INAF 5429 [0.5]	Selected Topics in Diplomacy and Foreign Policy	0.5
INAF 5501 [0.5]	Global Political Economy	0.5
INAF 5510 [0.5]	Law and Diplomacy	0.5
INAF 5605 [0.5]	The Ethical Dimension of International Affairs	0.5
INAF 5701 [0.5]	Global Environmental Change: Human Implications	0.5
INAF 5706 [0.5]	Global Health Policy	0.5
INAF 5709 [0.5]	Human Rights: International Politics and Policies	0.5
INAF 5800 [0.5]	Asia Pacific Economic and Political Relations	0.5
INAF 5805 [0.5]	The EU in International Affairs	0.5

Students that are admitted into the MA International Affairs program, with the approval of the NPSIA Admissions Committee, may receive advanced standing with transfer of credit of up to 1.0 credit in INAF courses at the 5000-level with a grade of B+ or higher, which can reduce their time to completion. Please note: INAF courses eligible for advanced standing cannot include the core requirements of the NPSIA M.A. program.

## M.A. International Affairs with Collaborative Specialization in African Studies (5.0 credits)

### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>2. 1.5 credit in:</b>		1.5
INAF 5015 [0.5]	Research Design and Methods for International Affairs	
INAF 5016 [0.5]	Statistical Analysis for International Affairs	
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	
<b>3. 0.5 credit in economics, successfully completed by the end of the second term, from (See Note 1, below):</b>		0.5
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	

INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
INAF 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>5. 0.5 credit in</b> Field and Elective courses (see Note 2, below)		<b>0.5</b>
6. Successful completion of second language proficiency examination (See Note 3, below)		
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>2. 1.5 credit in:</b>		<b>1.5</b>
INAF 5015 [0.5]	Research Design and Methods for International Affairs	
INAF 5016 [0.5]	Statistical Analysis for International Affairs	
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	
<b>3. 0.5 credit in</b> economics, successfully completed by the end of the second term, from: (See Note 1, below)		<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
INAF 5908 [1.0]	Research Essay (in the specialization)	
<b>5. 1.5 credits in</b> Field and Elective courses (See Note 2, below)		<b>1.5</b>
6. Successful completion of second language proficiency examination (see Note 3, below)		
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
INAF 5016 [0.5]	Statistical Analysis for International Affairs	
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	

<b>3. 0.5 credit in</b> economics, successfully completed by the end of the second term, from: (See Note 1, below)		<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>4. 1.0 credit in</b> courses accepted by the Institute of African Studies Graduate Coordinator as having sufficient African content and accepted by the NPSIA M.A. Program Supervisor or Associate Director as being relevant to the student's program of study. These courses would normally be drawn from the social science courses listed under the collaborative program. In years that it is offered, It is strongly suggested that NPSIA students include INAF 5603.		<b>1.0</b>
<b>5. 2.0 credits in</b> Field and Elective courses (See Note 2, below)		<b>2.0</b>
6. Successful completion of second language proficiency examination (see Note 3, below)		
<b>Total Credits</b>		<b>5.0</b>
1. All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309 , or approved equivalent, must be completed.		
2. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.		
3. Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Details of the language requirement are provided on the School website.		
<b>M.A. International Affairs with Collaborative Specialization in Climate Change (5.0 credits)</b>		
<b>Requirements - Thesis Pathway (5.0 credits)</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		<b>1.5</b>
INAF 5015 [0.5]	Research Design and Methods for International Affairs	
INAF 5016 [0.5]	Statistical Analysis for International Affairs	

INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	
<b>4. 0.5 credit in</b>	economics, successfully completed by the end of the second term, from: (see Note 1 below)	0.5
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5221 [0.5]	Economics of Security and Intelligence	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>4. 2.0 credits in:</b>		2.0
INAF 5909 [2.0]	M.A. Thesis (in the Specialization)	
5. Successful completion of second language proficiency examination (see Note 2 below)		
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research Essay pathway (5.0 credits)</b>		
<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		0.0
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credit in:</b>		1.5
INAF 5015 [0.5]	Research Design and Methods for International Affairs	
INAF 5016 [0.5]	Statistical Analysis for International Affairs	
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	
<b>4. 0.5 credit in</b>	economics, successfully completed by the end of the second term, from: (see Note 1 below)	0.5
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5221 [0.5]	Economics of Security and Intelligence	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>3. 1.0 credit in:</b>		1.0
INAF 5908 [1.0]	Research Essay (in the Specialization)	
<b>4. 1.0 credits in:</b>		1.0
Field and/or Elective courses (See Note 3 below)		

5. Successful completion of second language proficiency examination (see Note 2 below)		
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>		
<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		0.0
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in:</b>		1.0
INAF 5016 [0.5]	Statistical Analysis for International Affairs	
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	
<b>4. 0.5 credit in</b>	economics, successfully completed by the end of the second term, from: (see Note 1 below)	0.5
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5221 [0.5]	Economics of Security and Intelligence	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>5. 0.5 credit from:</b>		0.5
INAF 5701 [0.5]	Global Environmental Change: Human Implications	
INAF 5702 [0.5]	International Environmental Affairs	
A graduate course [0.5] with significant climate change content, approved by the MA Associate Director and Coordinator of the Climate Change Specialization		
<b>6. 2.0 credits in</b>	Field and/or Elective courses (see Note 3 below)	2.0
7. Successful completion of second language proficiency examination (see Note 2 below)		
<b>Total Credits</b>		<b>5.0</b>

#### Notes:

1. All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309, or approved equivalent, must be completed in order to receive the field designation.
2. Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies.
3. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit

selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.

### **M.A. International Affairs with Collaborative Specialization in Cybersecurity (5.0 credits)**

#### **Requirements - Thesis pathway**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
<b>2. 1.5 credits in:</b>	<b>1.5</b>
INAF 5015 [0.5]	Research Design and Methods for International Affairs
INAF 5016 [0.5]	Statistical Analysis for International Affairs
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
INAF 5018 [0.25]	Law and International Affairs
<b>3. 0.5 credit in economics, successfully completed by the end of the second term, from (See Note 1, below):</b>	<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development
INAF 5205 [0.5]	Economics of Conflict
INAF 5214 [0.5]	Economics for Defence and Security
INAF 5221 [0.5]	Economics of Security and Intelligence
INAF 5308 [0.5]	International Trade: Theory and Policy
INAF 5309 [0.5]	International Finance: Theory and Policy
INAF 5600 [0.5]	The Economics of Human Development
INAF 5703 [0.5]	International Public Economics
<b>4. 2.0 credits in:</b>	<b>2.0</b>
INAF 5909 [2.0]	M.A. Thesis (in the specialization)
5. Successful completion of second language proficiency examination (See Note 3, below)	
<b>Total Credits</b>	<b>5.0</b>

#### **Requirements - Research essay pathway:**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
<b>2. 1.5 credit in:</b>	<b>1.5</b>
INAF 5015 [0.5]	Research Design and Methods for International Affairs
INAF 5016 [0.5]	Statistical Analysis for International Affairs
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
INAF 5018 [0.25]	Law and International Affairs
<b>3. 0.5 credit in economics, successfully completed by the end of the second term, from: (See Note 1, below)</b>	<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development
INAF 5205 [0.5]	Economics of Conflict
INAF 5214 [0.5]	Economics for Defence and Security

INAF 5221 [0.5]	Economics of Security and Intelligence
INAF 5308 [0.5]	International Trade: Theory and Policy
INAF 5309 [0.5]	International Finance: Theory and Policy
INAF 5600 [0.5]	The Economics of Human Development
INAF 5703 [0.5]	International Public Economics
<b>4. 1.0 credit in:</b>	<b>1.0</b>
INAF 5908 [1.0]	Research Essay (in the specialization)
<b>5. 1.0 credits in Field and Elective courses (See Note 2, below)</b>	<b>1.0</b>
6. Successful completion of second language proficiency examination (see Note 3, below)	
<b>Total Credits</b>	<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>	
<b>1. 1.0 credit in:</b>	<b>1.0</b>
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity
<b>2. 1.0 credit in:</b>	<b>1.0</b>
INAF 5016 [0.5]	Statistical Analysis for International Affairs
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
INAF 5018 [0.25]	Law and International Affairs
<b>3. 0.5 credit in economics, successfully completed by the end of the second term, from: (See Note 1, below)</b>	<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development
INAF 5205 [0.5]	Economics of Conflict
INAF 5214 [0.5]	Economics for Defence and Security
INAF 5221 [0.5]	Economics of Security and Intelligence
INAF 5308 [0.5]	International Trade: Theory and Policy
INAF 5309 [0.5]	International Finance: Theory and Policy
INAF 5600 [0.5]	The Economics of Human Development
INAF 5703 [0.5]	International Public Economics
<b>4. 0.5 credit in courses in the area of the specialization and approved by the NPSIA M.A. Program Supervisor or Associate Director as being relevant to the student's program of study.</b>	<b>0.5</b>
<b>5. 2.0 credits in Field and Elective courses (See Note 2, below)</b>	<b>2.0</b>
6. Successful completion of second language proficiency examination (see Note 3, below)	
<b>Total Credits</b>	<b>5.0</b>

1. All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309, or approved equivalent, must be completed.
2. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from

a single department and a maximum of 1.0 credit selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.

- Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Details of the language requirement are provided on the School website.

### M.A. International Affairs with Collaborative Specialization in Data Science (5.0 credits)

#### Requirements - Thesis pathway:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 1.0 credit in:</b>	<b>1.0</b>
INAF 5016 [0.5]	Statistical Analysis for International Affairs
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
INAF 5018 [0.25]	Law and International Affairs
<b>3. 0.5 credit in Economics, successfully completed by the end of the second term from: (see Note 1, below)</b>	<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development
INAF 5205 [0.5]	Economics of Conflict
INAF 5214 [0.5]	Economics for Defence and Security
INAF 5308 [0.5]	International Trade: Theory and Policy
INAF 5309 [0.5]	International Finance: Theory and Policy
INAF 5600 [0.5]	The Economics of Human Development
INAF 5703 [0.5]	International Public Economics
<b>4. 2.0 credits in:</b>	<b>2.0</b>
INAF 5909 [2.0]	M.A. Thesis (in the specialization)
<b>5. 1.0 credit in Field or Elective courses</b>	<b>1.0</b>
6. Successful completion of second language proficiency examination (See Note 4, below)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 1.0 credit in:</b>	<b>1.0</b>
INAF 5016 [0.5]	Statistical Analysis for International Affairs
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
INAF 5018 [0.25]	Law and International Affairs
<b>3. 0.5 credit in Economics, successfully completed by the end of the second term, from: (See Note 1, below)</b>	<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development
INAF 5205 [0.5]	Economics of Conflict

INAF 5214 [0.5]	Economics for Defence and Security
INAF 5308 [0.5]	International Trade: Theory and Policy
INAF 5309 [0.5]	International Finance: Theory and Policy
INAF 5600 [0.5]	The Economics of Human Development
INAF 5703 [0.5]	International Public Economics
<b>4. 1.0 credit in:</b>	<b>1.0</b>
INAF 5908 [1.0]	Research Essay (in the specialization)
<b>5. 2.0 credits in Field or Elective Courses (See Note 3, below)</b>	<b>2.0</b>
6. Successful completion of second language proficiency examination (See Note 4, below)	
<b>Total Credits</b>	<b>5.0</b>
<b>Requirements - Coursework pathway:</b>	
<b>1. 0.5 credit in:</b>	<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 1.0 credit in:</b>	<b>1.0</b>
INAF 5016 [0.5]	Statistical Analysis for International Affairs
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
INAF 5018 [0.25]	Law and International Affairs
<b>3. 0.5 credit in specialization: (see Note 1, below)</b>	<b>0.5</b>
INAF 5904 [0.5]	Quantitative Research Methods
INAF 6002 [0.5]	Quantitative Research Methods
<b>4. 0.5 credit in Economics, successfully completed by the end of the second term, from: (see Note 2, below)</b>	<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development
INAF 5205 [0.5]	Economics of Conflict
INAF 5214 [0.5]	Economics for Defence and Security
INAF 5308 [0.5]	International Trade: Theory and Policy
INAF 5309 [0.5]	International Finance: Theory and Policy
INAF 5600 [0.5]	The Economics of Human Development
INAF 5703 [0.5]	International Public Economics
<b>5. 2.5 credits in Field or Elective courses (See Note 3, below)</b>	<b>2.5</b>
6. Successful completion of second language proficiency examination (see Note 4, below)	
<b>Total Credits</b>	<b>5.0</b>

#### Notes:

- The course must include at least one major assignment with a significant data science component. The selected course must be approved by the School and Institute for Data Science. An accepted data science specialization course from outside the School can be used for this requirement with approval.
- All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP

field both INAF 5308 and INAF 5309 , or approved equivalent, must be completed.

3. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.
4. Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Details of the language requirement are provided on the School website.

### **M.A. International Affairs with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	<b>0.0</b>
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.5 credits in:</b>	<b>1.5</b>
INAF 5015 [0.5]	Research Design and Methods for International Affairs
INAF 5016 [0.5]	Statistical Analysis for International Affairs
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
INAF 5018 [0.25]	Law and International Affairs
<b>4. 0.5 credit in ECON, successfully completed by the end of the second term, from (See Note 1, below):</b>	<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development
INAF 5205 [0.5]	Economics of Conflict
INAF 5214 [0.5]	Economics for Defence and Security
INAF 5308 [0.5]	International Trade: Theory and Policy
INAF 5309 [0.5]	International Finance: Theory and Policy
INAF 5600 [0.5]	The Economics of Human Development
INAF 5703 [0.5]	International Public Economics
<b>5. 2.0 credits in:</b>	<b>2.0</b>
INAF 5909 [2.0]	M.A. Thesis (M.A. Thesis on an approved topic with significant content related to Latin American and Caribbean Studies, and under the supervision or co-supervision of a faculty member approved by the Graduate Supervisor of the LACS program.)
<b>6. 0.5 credit in: Field and Elective courses (see Note 2, below)</b>	<b>0.5</b>

7. Successful completion of second language proficiency examination (See Note 3, below)

**Total Credits** **5.0**

#### **Requirements - Research Essay pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	<b>0.0</b>
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.5 credits in:</b>	<b>1.5</b>
INAF 5015 [0.5]	Research Design and Methods for International Affairs
INAF 5016 [0.5]	Statistical Analysis for International Affairs
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
INAF 5018 [0.25]	Law and International Affairs
<b>4. 0.5 credit in economics, successfully completed by the end of the second term, from: (See Note 1, below)</b>	<b>0.5</b>
INAF 5009 [0.5]	International Aspects of Economic Development
INAF 5214 [0.5]	Economics for Defence and Security
INAF 5205 [0.5]	Economics of Conflict
INAF 5308 [0.5]	International Trade: Theory and Policy
INAF 5309 [0.5]	International Finance: Theory and Policy
INAF 5600 [0.5]	The Economics of Human Development
INAF 5703 [0.5]	International Public Economics
<b>5. 1.0 credit in:</b>	<b>1.0</b>
INAF 5908 [1.0]	Research Essay (on an approved topic with significant content related to Latin American and Caribbean Studies, and under the supervision or co-supervision of a faculty member approved by the Graduate Supervisor of the LACS program.)
<b>6. 1.5 credits in: Field and Elective courses (See Note 2, below)</b>	<b>1.5</b>
7. Successful completion of second language proficiency examination (see Note 3, below)	
<b>Total Credits</b>	<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>	
<b>1. 0.5 credit in:</b>	<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	<b>0.0</b>
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.0 credit in:</b>	<b>1.0</b>
INAF 5016 [0.5]	Statistical Analysis for International Affairs
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process
INAF 5018 [0.25]	Law and International Affairs

**4. 0.5 credit in** economics, successfully completed by the end of the second term, from: (See Note 1, below) 0.5

INAF 5009 [0.5]	International Aspects of Economic Development
INAF 5205 [0.5]	Economics of Conflict
INAF 5214 [0.5]	Economics for Defence and Security
INAF 5308 [0.5]	International Trade: Theory and Policy
INAF 5309 [0.5]	International Finance: Theory and Policy
INAF 5600 [0.5]	The Economics of Human Development
INAF 5703 [0.5]	International Public Economics

**5. 1.0 credit in** courses accepted by the Latin American and Caribbean Studies Program Graduate Coordinator as having sufficient regional content and accepted by the NPSIA M.A. Program Supervisor or Associate Director as being relevant to the student's program of study. 1.0

**6. 2.0 credits in** Field and Elective courses (See Note 2, below) 2.0

7. Successful completion of second language proficiency examination (see Note 3, below)

**Total Credits** 5.0

#### Notes:

1. All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309, or approved equivalent, must be completed.
2. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.
3. Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. There is an administrative fee for the standard test (which leads to a certificate of language proficiency after successful completion). Details of the language requirement are provided on the School website.

### Ph.D. International Affairs (3.5 credits)

#### Requirements:

**1. 1.5 credits in:** 1.5

INAF 6001 [0.5]	Qualitative Research Methods
INAF 6002 [0.5]	Quantitative Research Methods
INAF 6003 [0.5]	Advanced International Policy Analysis

**2. 0.0 credit in:**  
INAF 6005 [0.0] Doctoral Research Seminar

**3. 0.5 credit in** required INAF economics course for the declared field listed above (see Note) 0.5

**4. 1.0 credit in** courses in the declared field 1.0

#### 5. Language requirement

Doctoral students must successfully complete an examination in a second language administered by the School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Students are expected to complete this requirement or demonstrate significant progress by the end of their fourth term.

**6. 0.5 credit in:** 0.5

INAF 6906 [0.5] Doctoral Research Prospectus Seminar and Defence

**7. 0.0 credits in:** 0.0

INAF 6909 [0.0] Doctoral Research Thesis

**Total Credits** 3.5

**Note:** students without strong economics training may be required to complete additional INAF economics courses.

#### Completion Timeline

Ph.D. students must be continuously registered as part-time or full-time for the duration of their program; approval of the School must be obtained to transition from full-time to part-time status, and vice versa. Full-time students are expected to successfully complete INAF 6005 by the end of their first term, the remaining required 3.0 credits of coursework by the end of their second term, and INAF 6906 (research prospectus and defence) no later than the end of their fourth term. Part-time students are expected to successfully complete INAF 6005 by the end of their second term in the program, the remaining required 3.0 credits of coursework by the end of their sixth term, and INAF 6906 (research prospectus and defence) no later than the end of their eighth term.

A full-time student whose performance in INAF 6005 is not deemed satisfactory at the end of their first full-time term may be granted an extension to the end of their second full-time term. A part-time students whose performance in INAF 6005 is not deemed satisfactory at the end of their second part-time term may be granted an extension to the end of their fourth part-time term. A student whose performance in INAF 6906 is not deemed satisfactory may be granted a second opportunity to defend their research prospectus, provided that this can take place before the end of their fourth full-time term or sixth part-time term.

Students who have not successfully completed INAF 6005 or INAF 6906 within the specified time will be subject to removal from the program. Students may register in INAF 6909 only following successful completion of INAF 6906 (including prospectus defence), are expected to demonstrate evidence of research progress annually, and are required to present their work at the NPSIA Research Seminar Series or show equivalent research activity.

## Ph.D. International Affairs with Collaborative Specialization in African Studies (5.0 credits)

### Requirements - Standard Admission:

<b>1. 1.5 credits in:</b>	<b>1.5</b>
INAF 6001 [0.5]	Qualitative Research Methods
INAF 6002 [0.5]	Quantitative Research Methods
INAF 6003 [0.5]	Advanced International Policy Analysis
<b>2. 0.5 credit in:</b>	<b>0.5</b>
INAF 6005 [0.0]	Doctoral Research Seminar
<b>3. 0.5 credit in</b> required INAF economics course for the declared field listed above (see Note)	<b>0.5</b>
<b>4. 1.0 credit in</b> courses in the declared field	<b>1.0</b>
<b>5. 0.5 credit in:</b>	<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>6. 0.0 credit in:</b>	
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>7. 0.5 credit in:</b>	<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions
8. Doctoral students must successfully complete an examination in a second language administered by the School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Students are expected to complete this requirement or demonstrate significant progress by the end of their fourth term.	
<b>9. 0.5 credit in:</b> doctoral research seminar and public defence of the doctoral research prospectus	<b>0.5</b>
INAF 6906 [0.5]	Doctoral Research Prospectus Seminar and Defence
<b>10. 0.0 credit in:</b>	<b>0.0</b>
INAF 6909 [0.0]	Doctoral Research Thesis (in the Specialization)
<b>Total Credits</b>	<b>5.0</b>

**Note:** students without strong economics training may be required to complete additional INAF economics courses.

## Ph.D. International Affairs with Collaborative Specialization in African Studies (Advanced Completion Option - 4.5 credits)

Applicants to the Ph.D. International Affairs with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies may be considered for admission to an Advanced Completion Option of the Ph.D.

### Requirements - Advanced Completion Option:

<b>1. 1.5 credits in:</b>	<b>1.5</b>
INAF 6001 [0.5]	Qualitative Research Methods
INAF 6002 [0.5]	Quantitative Research Methods
INAF 6003 [0.5]	Advanced International Policy Analysis
<b>2. 0.5 credit in:</b>	<b>0.5</b>
INAF 6005 [0.0]	Doctoral Research Seminar

<b>3. 0.5 credit in</b> required INAF economics course for the declared field listed below (see Note, below)	<b>0.5</b>
<b>4. 1.0 credit in</b> courses in the declared field	<b>1.0</b>
<b>5. 0.5 credit in:</b>	<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions
6. Doctoral students must successfully complete an examination in a second language administered by the School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. Students are expected to complete this requirement or demonstrate significant progress by the end of their fourth term.	
<b>7. 0.5 credit in:</b> doctoral research seminar and public defence of the doctoral research prospectus	<b>0.5</b>
INAF 6906 [0.5]	Doctoral Research Prospectus Seminar and Defence
<b>8. 0.0 credit in:</b>	<b>0.0</b>
INAF 6909 [0.0]	Doctoral Research Thesis (in the specialization)
<b>Total Credits</b>	<b>4.5</b>

**Note:** students without strong economics training may be required to complete additional INAF economics courses.

## Regulations

See the General Regulations section of this Calendar.

A grade of B- or better must be obtained in each credit counted towards the master's degree. The School does not permit exceptions to this rule.

Students will be required to withdraw from the program if their grade point average falls below 7.0 (B-), or if they receive a grade of less than B- in any two courses that are eligible to be counted toward the Master's degree.

## Part-time program requirements

In some cases, an applicant with relevant full-time employment experience may be admitted to a part-time M.A. program. While the program requirements are the same as those for full-time students, part-time students may take up to six calendar years from the date of initial registration to complete the program.

Part-time students must register for a minimum of one term in three, and must successfully complete INAF 5016, INAF 5017, and INAF 5018 within their first 2.5 program credits. In addition, the economics course requirement must be included in the first 2.5 credits completed.

Students enrolled in the full-time master's program may transfer to the part-time program only under exceptional circumstances as approved by the Vice Provost (Graduate Studies).

## Regulations

See the General Regulations section of this Calendar.

To complete the doctoral program, students must obtain a grade of B- or higher in each course credit, and Satisfactory in the comprehensive examination, the research prospectus defence, and the Ph.D. dissertation and its oral defence. Normally, a NPSIA doctoral student may obtain a grade lower than B- only once. A subsequent

occurrence of a grade lower than B- may result in removal from the Ph.D. program.

### **M.A. International Affairs/J.D.**

Students will complete both the M.A. and the J.D. programs over four calendar years.

Students will be expected to fulfil the normal requirements of both the M.A. and J.D. programs.

In addition, students in the M.A./J.D. program must complete INAF 5509 as one of their M.A. Field and Elective courses.

Students must also complete a course in international law to be specified by the Faculty of Law, University of Ottawa.

Of the 5.0 credits completed for the M.A. degree, 1.0 credit is also applied to the Juris Doctor degree.

Students undertaking the Research Essay pattern for the M.A./J.D. will be expected to integrate both components of the joint program into their Research Essay topic.

### **Internship Option**

The Internship option is available to all first year, full-time students in the M.A. and the M.A.-JD programs. Registration in the Internship Program option requires departmental permission, and is limited by the availability of placements. Application for an internship placement will normally be considered after the student has successfully completed 1.5 credits, including INAF 5015 and INAF 5016.

Internship placements will locate students for one term in the public service, the private sector, or non-governmental organizations. During their work term, students are required to register in INAF 5914, which is additional to the program requirements described above. Registration in the Internship Program is restricted to full-time students.

### **Co-operative Education**

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

### **Application Requirements**

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

### **Participation Requirements**

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.
- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.

- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

### **Co-op Participation Agreement**

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

### **Communication with the Co-op Office**

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

### **Graduation with the Co-op Designation**

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

### **Employment**

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

### **Work Term Assessment and Evaluation**

#### **Work Term Evaluation**

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

#### **Work Term Assessment**

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

### **Voluntary Withdrawal from the Co-op Option**

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or

withdraw from the co-op option until they have completed the requirements of the work term.

### **Involuntary or Required Withdrawal from the Co-op Option**

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### **International Students**

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

### **Co-op Fees**

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

### **International Affairs M.A. Co-operative Education Option**

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the M.A. in International Affairs;
2. have successfully completed by the end of their first term of academic study:
  - a. INAF 5016 [0.5] Statistical Analysis for International Affairs
  - b. INAF 5017 [0.25] International Policymaking in Canada: Structure and Process
  - c. INAF 5018 [0.25] Law and International Affairs
  - d. 0.5 credit in INAF course of student's choosing
3. have successfully completed by the start-date of the first work term:
  - a. 0.5 credit in INAF Economics course required for student's field
  - b. 1.0 credit in INAF course(s) of student's choosing
4. be registered as a full-time student in each academic term prior to a work term;

5. be eligible to work in Canada (for off-campus work terms)

For more information, please refer to the Co-operative Education Policy.

### **Admission**

The minimum requirement for admission into the master's program is a B.A. (Honours) degree in a discipline related to international affairs.

Under current practice, at least a high honours standing (B+ minimum) is normally required to be considered for admission to the program.

Applicants may submit Graduate Record Examination (GRE) aptitude test scores; in some circumstances, students may be required to submit GRE scores.

The language of instruction in NPSIA is English. Applicants whose first language is not English need to demonstrate their proficiency in English. Graduate calendar regulation 3.6 lists the ways in which applicants can satisfy this requirement. Applicants who present their most recent degree and transcripts from a Canadian institution are exempt from language proficiency requirements.

Students admitted to the NPSIA M.A. program must have successfully completed a 1.0 credit (or the equivalent) course in introductory economics (introductory microeconomics and introductory macroeconomics for economics majors) before starting the program.

Students who have not completed one credit of introductory economics at the time of their application will have their admission into the program made conditional upon its successful completion prior to registration. In some cases where the student is deemed by the admissions committee to have an insufficient background in international affairs they may be required to complete up to two additional courses as part of their M.A. program. Students who are uncertain about whether they meet the background requirements are encouraged to contact the School of International Affairs.

### **Accelerated Pathway**

The accelerated pathway to the Master of Arts degree at the Norman Paterson School of International Affairs (NPSIA) is a flexible and individualized plan of graduate study for students in their final year of a Carleton undergraduate degree in a related discipline such as the Global and International Affairs (BGInS) and Public Affairs and Policy Management (BPAPM) degrees.

Students in the third year of study of their undergraduate program who are interested in the accelerated pathway should consult with the Associate Director (M.A. program) at NPSIA to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses and Honours project/thesis supervisor for their final year of undergraduate studies.

To be eligible to participate in the accelerated pathway, students must have a minimum overall CGPA of A- in undergraduate courses.

## Admission

Admission into the Ph.D. program will be judged primarily on the applicant's ability to undertake research successfully, and his/her prospects for completion of the program. Admission to the Ph.D. program is governed by the requirements stated in the General Regulations section of this Calendar.

The normal requirement for admission to the doctoral program in International Affairs is a Master's degree in a social science with at least an A- average. Relevant work experience is also considered.

Applicants are required to have prior training in international relations and economics. The normal requirement is a minimum of 0.5 credit (or the equivalent) in international relations, 1.0 credit (or equivalent) in introductory economics (introductory microeconomics and introductory macroeconomics), plus at least 0.5 credit (or the equivalent) in advanced economics or intermediate economic theory above the 1000-level to be considered for admission. In addition, students who are admitted to the doctoral program, but who lack sufficient background in their field of study may be required to take additional graduate-level courses (extra to degree requirements) in preparation for their field examination.

The language of instruction in NPSIA is English. Applicants whose first language is not English need to demonstrate their proficiency in English. Graduate calendar regulation 3.6 lists the ways in which applicants can satisfy this requirement. Applicants who present their most recent degree and transcripts from a Canadian institution are exempt from language proficiency requirements.

### Transfer from the Master's to the Ph.D. Program

Students in the full-time M.A. program who demonstrate outstanding academic performance and research potential may, with permission of the Ph.D. Associate Director, be admitted to the Ph.D. program after two terms of registration.

Students considering this option will be advised, when selecting courses for their M.A. program, to choose those courses at the master's level which are open to doctoral students and which may assist them in the doctoral comprehensive examinations.

## International Affairs (INAF) Courses

### INAF 5002 [0.5 credit]

#### International Development Policy

Review of current political, social and economic issues in international development policy. Sample topics include international institutions and global governance, development assistance, economic liberalization, gender, the environment and natural resources, food security, crime and conflict.

### INAF 5006 [0.5 credit]

#### Food Security and Rural Development

How the agricultural sector affects rural development and food security. Topics include an examination of the global agricultural market, biofuels, structural change in agriculture and agrarian reform, agriculture and the environment, and public policies affecting agriculture and rural development.

### INAF 5007 [0.5 credit]

#### Theories of Development and Underdevelopment

A comparative analysis of approaches to the study of development processes and underdevelopment, including structural-functional, neo-classical, Marxist, and dependency theories.

Prerequisite(s): enrolment in the Development Administration stream of the M.A. program in the School of Public Policy and Administration, or permission of the School of International Affairs.

### INAF 5009 [0.5 credit]

#### International Aspects of Economic Development

Economic theory and policy dimensions of key issues in international economic development. Topics include: trade theory and policy for developing countries; debt, adjustment and macroeconomic stabilization; the role of international financial institutions; financial flows and the role of multinational corporations.

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School.

### INAF 5015 [0.5 credit]

#### Research Design and Methods for International Affairs

Key principles of social sciences research, basics of research design, and techniques of analysis. Emphasis on applications to international affairs and policy evaluation. Precludes additional credit for INAF 5001 (no longer offered) and INAF 5013 (no longer offered).

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School of International Affairs.

### INAF 5016 [0.5 credit]

#### Statistical Analysis for International Affairs

Applications of statistics to international policy issues, using statistical software to understand and present large sample empirical information. Topics include describing data, presenting data, comparing variables and hypothesis testing, and basic multiple linear regression.

Precludes additional credit for INAF 5001 (no longer offered) and INAF 5014 (no longer offered).

**INAF 5017 [0.25 credit]****International Policymaking in Canada: Structure and Process**

Structure and policymaking processes of the Canadian government: the role of Parliament, the Prime Minister and Cabinet, central agencies, and departments involved in international and national security affairs; the application of theories of policymaking to international affairs.

Precludes additional credit for INAF 5011 (no longer offered).

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School of International Affairs.

**INAF 5018 [0.25 credit]****Law and International Affairs**

Introduction to international law and its role in international affairs. International legal sources and subjects, state responsibility, succession, jurisdiction and immunities, dispute settlement, and domestic implementation.

Precludes additional credit for INAF 5012 (no longer offered).

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School of International Affairs.

**INAF 5100 [0.5 credit]****Canada in International Affairs**

Canada's role in international affairs; issues of conflict and conflict resolution, international political economy, and international development. Analysis of the content and formulation of Canada's international policies.

**INAF 5101 [0.5 credit]****The Politics and Institutions of International Trade**

Canadian trade practice; trade policy within the broader context of Canadian policy-making, comparison of Canadian policy and practice with that in the United States, Europe, Japan, and the major developing countries.

**INAF 5108 [0.5 credit]****Conflict Analysis**

The causes of international and intrastate war and violent conflict, with a focus on preventable causes. Explores major theories, hypotheses, debates and historical controversies from a range of social science perspectives, with emphasis on the implications for diplomacy, foreign and military policy.

Precludes additional credit for INAF 5105 (taken prior to 2001).

**INAF 5109 [0.5 credit]****Conflict Management: Theory and Evidence**

Evaluation of conflict management theory and practice in regional, interstate and intrastate conflict. Analyse the various dimensions of conflict management - including prevention, mitigation, and containment, as well as military engagement - and assess the efficacy of these approaches in contemporary case studies.

Includes: Experiential Learning Activity

**INAF 5200 [0.5 credit]****Peacebuilding and Reconstruction: Theory and Practice**

Complexities and challenges of contemporary peacebuilding, reconstruction and reconciliation after violent conflict. Critical evaluation of post-war political, social, legal, and security arrangements and institutions for preventing violence and enhancing long-term peace and stability in war-torn societies.

Includes: Experiential Learning Activity

**INAF 5201 [0.5 credit]****Disarmament, Arms Control and Nonproliferation**

Origins, theory and practice, with a focus on so-called weapons of mass destruction and current controversies. Emphasis on treaty negotiation and implementation, including monitoring, verification, facilitation and enforcement of compliance.

Also listed as IPIS 5301.

**INAF 5202 [0.5 credit]****Contemporary International Security**

The evolving contemporary strategic and security environment, encompassing both traditional and non-traditional concepts. Topics include hegemony; the rise of new powers; terrorism; multilateralism; human security; and new security threats, including climate change.

Also listed as IPIS 5302.

**INAF 5203 [0.5 credit]****International Mediation and Conflict Resolution**

Exploration of various approaches to the prevention, management and resolution of international conflict including peacekeeping, preventive diplomacy, mediation and peacebuilding, as well as less formal mechanisms for third party collaborative problem solving.

**INAF 5204 [0.5 credit]****Intelligence and International Affairs**

Advanced introduction to the study of intelligence from an academic perspective, how it is conducted, its role and limits in democratic states. Topics include: the intelligence cycle; intelligence collection and analysis; intelligence and policy relationships; intelligence accountability and control; and international liaison and cooperation.

Also listed as IPIS 5303.

**INAF 5205 [0.5 credit]****Economics of Conflict**

Application of economic and rationalist perspectives and methods to the understanding of the origins and consequences of conflict and conflict management, including game theory, basic modelling, and understanding statistical applications to conflict studies.

**INAF 5206 [0.5 credit]****Civil-Military Relations**

Analytical and normative exploration of civilian control of the military and of militaries' responses to civilian control. The course will compare and contrast the case of Canada with the US and other democracies as well as examining civil-military relations in authoritarian regimes.

**INAF 5207 [0.5 credit]****Middle East Economic and Political Relations**

Reviews modern political and economic history of the Middle East and North Africa. Examines cross-cutting themes and processes that have marked the region and shape its politics, including colonialism and nationalism; the politics of oil; migration; gender; religion; the Arab uprisings and their aftermath.

**INAF 5208 [0.5 credit]****U.S. Foreign and Security Policy**

Causes and consequences of U.S. foreign and security policy. Explanation and evaluation of past and present U.S. policies. Cases will be drawn from post-Cold War and post 9-11 U.S. policies.

**INAF 5209 [0.5 credit]****Conflict and Development**

Examination of competing interpretations of conflict in developing countries; material conditions, institutional factors, and ideological, or identity-based framing processes. The impact of war on development, and implications for policy.

**INAF 5210 [0.5 credit]****Technology and War**

The impact of technology on modern armed conflict, including the way states decide to use (or not use) force and debates over the ethics of war. Topics include: unmanned technologies, nuclear weapons, social media and technologies of peace.

**INAF 5211 [0.5 credit]****Comparative Defence Policy**

Politics and processes shaping defence policies around the world. Topics include defence budgeting, recruitment and retention, gender and diversity in defence. Examines and assesses the roles played by armed forces, ministries/departments of defence, political leadership and legislatures.

**INAF 5212 [0.5 credit]****Issues in War and Defence Studies**

Contemporary issues and topics related to the conduct of warfare and defence policymaking. Topics include military strategy and conduct of operations, and challenges in defence policy such as procurement.

**INAF 5214 [0.5 credit]****Economics for Defence and Security**

Economic theories and applications for national defence and security policy. Key topics include the military production function, procurement, contract theory, military forces management, the defence industrial base, alliance burden-sharing and the demand for military expenditures.

**INAF 5218 [0.5 credit]****Post-Conflict Justice: Theory and Practice**

Domestic and international responses to war crimes, wartime atrocities, and human rights abuses. Emphasis on theoretical and policy debates, and relationship of post-war trials, truth commissions, and other accountability measures to democratic development, rule of law, reconciliation, and violent conflict resolution and prevention.

Includes: Experiential Learning Activity

**INAF 5219 [0.5 credit]****Rights, Development, and Conflict**

Uses economic institutionalism to examine the intersection of development and conflict, focusing on how the connection between property rights and development affects conflict. Topics include gender, land conflict, urban peripheries, migration and refugees, domestic and transnational crime, and state violence.

**INAF 5220 [0.5 credit]****Intelligence Analysis**

Theoretical and empirical literature related to intelligence analysis including the role and challenges of intelligence analysis, politicization of intelligence, analytical mindsets and limits of intelligence analysis, current versus long-term intelligence, estimative analysis, Structured Analytical Techniques, intelligence analytical products, the intelligence to policymaker dimension.

**INAF 5221 [0.5 credit]****Economics of Security and Intelligence**

The political economy of national security, collective action, terrorism and counter terrorism, economic sanctions, networks, cyber security and deterrence. Combines both economic theory and empirics to understand the role and scope of intelligence collection and analysis.

**INAF 5223 [0.5 credit]****Counterterrorism**

Theory and practice of counterterrorism based on contemporary and historical experience of Western democracies including the role of law enforcement, intelligence, military force, diplomacy, and civil society in counterterrorism and assessment of the legal, ethical, human rights and civil liberties implications of contemporary counterterrorism.

Includes: Experiential Learning Activity

**INAF 5224 [0.5 credit]****Intelligence and National Security**

The function and purpose of intelligence and activities of intelligence agencies in relation to contemporary national security challenges faced by Western democratic states; role of intelligence in strategic and operational warning, decision-making, and the policy, legal and ethical dimensions of intelligence and national security.

Also listed as IPIS 5304.

**INAF 5225 [0.5 credit]****Cybersecurity in Canada**

Social and technical issues arising from cybersecurity threats, and the public and private policy responses to threats. Cybersecurity in Canada, including the implications for Canada arising from cyber policy of other key countries as well.

**INAF 5226 [0.5 credit]****Cyber Warfare**

Defines and examines the emerging issue of cyber conflict. Surveys existing techniques, policies, and legal tools for using, or defending against, cyberattacks during both peacetime and war.

**INAF 5228 [0.5 credit]****Espionage and Foreign Influence**

This course focuses on issues in relation to emerging national security threats in the area of espionage and foreign interference. Topics include economic national security and foreign investment, online and in-person foreign interference, and ethical issues such as community relations.

Includes: Experiential Learning Activity

Precludes additional credit for INAF 5469W (taken W2020-2024).

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School.

**INAF 5234 [0.5 credit]****National Security Policy and Law**

The legal and policy implications of identifying and responding to national security threats. Topics include: intelligence gathering; verification regimes; military and counter-terrorism operations; criminal prosecution; and, balancing human rights and security concerns. This course includes experiential learning.

Includes: Experiential Learning Activity

Also listed as IPIS 5305.

**INAF 5244 [0.5 credit]****Terrorism and International Security**

Contemporary international terrorism in comparative perspective, including religious and ideological motivations, recruitment and participation, evolving structures and dynamics of terror networks, financing and operations, and counter-terrorism measures. Examples are drawn from international and domestic terrorism.

Also listed as IPIS 5104.

**INAF 5254 [0.5 credit]****Capstone in Canadian Security Policy**

Students practice researching and writing reports in the area of national and cyber security policy. Students work in groups to explore a novel security consideration or puzzle in collaboration with a pre-selected government partner.

Includes: Experiential Learning Activity

**INAF 5300 [0.5 credit]****Foreign Direct Investment: Theory and Policy**

Concepts, theories, evaluation and analysis of foreign direct investment (FDI) and policies affecting international investment. Effects of FDI on source and recipient countries; including FDI to and from developing countries; and national and international policies affecting FDI flows.

Includes: Experiential Learning Activity

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs, or permission of the School of International Affairs.

**INAF 5301 [0.5 credit]****Strategic Foresight in International Security**

Introduces students to the methods and approaches used to identify, explore, and assess emerging and future trends in international security. Students apply a variety of tools and techniques for thinking creatively about the future of terrorism, crime, cybersecurity, weaponry, warfare, and intelligence.

Includes: Experiential Learning Activity

**INAF 5305 [0.5 credit]****International Bargaining and Negotiation: Theory and Practice**

An examination of bargaining and negotiation in international economic, political, and security issue areas, using case studies and theoretical analysis.

Includes: Experiential Learning Activity

**INAF 5306 [0.5 credit]****Trade Policy in North America**

Canadian, American and Mexican trade and trade policy emphasizing trade relations and the negotiation and operation of bilateral, regional (NAFTA/CUSMA), and multilateral trade agreements.

Includes: Experiential Learning Activity

**INAF 5308 [0.5 credit]****International Trade: Theory and Policy**

Basic theories and policies in international trade. Topics include: theories of the pattern of trade, gains from trade, the theory of distortions and welfare; and evaluation and analysis of trade policy tools including tariffs, subsidies and other trade barriers (export controls, new industrial policies).

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School.

**INAF 5309 [0.5 credit]****International Finance: Theory and Policy**

Theory and policy in open economy macroeconomics and international finance. Topics include: exchange rate and output determination, balance of payments adjustment, monetary and fiscal policy under different exchange rate regimes, and the structure and performance of the international monetary system.

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School.

**INAF 5312 [0.5 credit]****The Practice of Trade Negotiations**

Skills-based course on how to design and implement a government's trade negotiations strategy. The course will examine each stage in trade negotiations, using real-life cases and simulations to apply the knowledge learned. Practical examples will be drawn from both the developed and developing worlds.

Includes: Experiential Learning Activity

Precludes additional credit for INAF 5459F (taken 2020-2023).

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School.

**INAF 5400 [0.5 credit]****Trade Policy Analysis**

Selected trade policy instruments and trade-related policy issues. Analytical approaches to tariffs, quotas, dumping and countervailing duties, and policy analysis on global value chains and friendshoring.

Includes: Experiential Learning Activity

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs, or permission of the School of International Affairs.

**INAF 5401 [0.5 credit]****International Financial Institutions and Policy**

Economic and political economy perspectives on the development and operation of international financial institutions and markets, how they have been shaped by critical events and policies in global finance, and the policy options for wealthy countries, emerging market economies, and poorer countries.

Includes: Experiential Learning Activity

**INAF 5402 [0.5 credit]****Territory and Territoriality**

Contemporary geographical and international relations theorizing is challenging conventional notions of boundaries and territories in the political organization of modernity. Using contemporary writings on geopolitics, security, sovereignty, self-determination and identity politics, this course investigates territoriality as a political and intellectual strategy.

Includes: Experiential Learning Activity

Also listed as GEOG 5400.

**INAF 5403 [0.5 credit]****Diplomacy and Foreign Policy: Theory and Practice**

Introduces actors, institutions, and formats of modern diplomacy and foreign policy, and examines the changing global policy context. Focuses on practical skills development such as diplomatic briefing and negotiation.

Includes: Experiential Learning Activity

**INAF 5404 [0.5 credit]****Advanced Canadian Foreign Policy**

A more complete understanding of the central elements of Canadian foreign policymaking process and engagement in the details of policy formulation and development in an applied context. Canadian foreign policy situated within changing international systems and challenges it poses to Canadian decision-makers.

Precludes additional credit for INAF 5429W (taken 2020-2024).

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School. Seminar

**INAF 5405 [0.5 credit]****International Organizations in International Affairs**

Theory of international organizations, the history of their accelerated emergence since World War II and a critical analysis of the roles they play in international affairs, with an emphasis on the United Nations and its subsidiary, specialized and associated agencies, and regional and sub-regional organizations.

**INAF 5407 [0.5 credit]****International Relations Theory**

Overview of theories of international relations. Organized both historically and conceptually, the course will examine a variety of theoretical approaches to international relations, among them the realist, liberal, structural, neo-realist, and critical perspectives.

**INAF 5408 [0.5 credit]****Gender in International Affairs**

Analyses the concept of gender and provides training in gender-based analysis. Examines how gender shapes international affairs, including diplomacy and mediation, conflict, development, and the global economy.

Includes: Experiential Learning Activity

**INAF 5409 [0.5 credit]****Selected Topics in International Affairs****INAF 5410 [0.5 credit]****Global Public Policy**

Public policy at the international level, including the roles of international institutions, states, non-governmental organizations and business in problem solving, policy making and governance. Examples of global policy problems include labour rights, public health, financial regulation, internet governance and environment.

**INAF 5411 [0.5 credit]****Internet Governance**

Challenges of Internet governance at the national and global levels including trust, security and privacy; the expanding importance of the Internet to society and the economy; comparative and diffuse regulatory regimes, and challenges posed by the 'Dark Web' and the manipulation of content.

**INAF 5419 [0.5 credit]****Selected Topics in International Affairs****INAF 5429 [0.5 credit]****Selected Topics in Diplomacy and Foreign Policy**

Selected Topics in Diplomacy and Foreign Policy. Topics may vary from year to year.

**INAF 5439 [0.5 credit]****Selected Topics in Security and Defence Policy**

Selected Topics in Security and Defence Policy. Topic may vary from year to year.

**INAF 5449 [0.5 credit]****Selected Topics in Conflict Analysis and Resolution****INAF 5459 [0.5 credit]****Selected Topics in International Economic Policy**

Includes: Experiential Learning Activity

**INAF 5469 [0.5 credit]****Selected Topics in Intelligence and International Affairs**

Topic may vary from year to year.

**INAF 5479 [0.5 credit]****Selected Topics in International Organizations and Global Public Policy****INAF 5489 [0.5 credit]****Selected Topics in International Development Policy****INAF 5499 [0.5 credit]****Selected Topics in Health, Displacement and Humanitarian Policy**

Selected Topics in Health, Displacement and Humanitarian Policy. Topics may vary from year to year.

**INAF 5501 [0.5 credit]****Global Political Economy**

The interaction between states, interest groups, firms and markets, how the global nature of the world economy affects states, especially Canada, and the governance of economic issues at the international level including trade, investment, finance and development.

Precludes additional credit for INAF 5000 (taken prior to 2001).

**INAF 5502 [0.5 credit]****State Sovereignty and Globalization**

How increased political, social and economic integration internationally affects a government's ability to formulate policy; examination of domestic and international policy issues and whether and how global forces and their domestic counterparts shape the policy-making environment.

Includes: Experiential Learning Activity

Precludes additional credit for INAF 5000 (taken prior to 2001).

**INAF 5504 [0.5 credit]****Advanced International Law: Principles and Practice**

Critical assessment of international law in key areas of international affairs, including its development, content, application, and relationship to the behaviour and interests of various actors. Specific areas include human rights, self-determination, armed force, trade, criminal justice, and environmental law.

Prerequisite(s): INAF 5018 (may be taken concurrently) and M.A. standing in the Norman Paterson School of International Affairs, or permission of the School of International Affairs.

**INAF 5505 [0.5 credit]****International Law: Theory and Practice**

Theoretical perspectives on international law and the role international law plays in the international system. Topics include basis, creation and sources of international law, international dispute resolution, and international law and world order transformation.

Also listed as LAWS 5603.

**INAF 5506 [0.5 credit]****International Law: Use of Force**

Specialized international legal principles governing the use of armed force, and their theoretical and practical implications, with a view to understanding and critiquing their roles in limiting and justifying state recourse to armed force and regulating the conduct of resulting inter- and intra-state conflict.

Prerequisite(s): INAF 5018 (may be taken concurrently).

**INAF 5507 [0.5 credit]****International Economic Law: Regulation of Trade and Investment**

Study of regulation of international economic relations. International institutions, legal aspects of integration, governmental regulation of trade and investment.

Also listed as LAWS 5200.

Prerequisite(s): open only to graduate students in their master's year who have not previously studied international economic law.

**INAF 5509 [0.5 credit]****Law, Politics, and Economics in International Affairs**

Linkages and differences between the disciplines of law, political science and economics as they relate to international affairs. How underlying assumptions of each discipline affect the way different issues in international affairs are considered.

Prerequisite(s): M.A./JD standing in the Norman Paterson School of International Affairs or permission of the School.

**INAF 5510 [0.5 credit]****Law and Diplomacy**

International law as a tool of diplomacy and foreign policy, including international diplomatic law. Legal and practical considerations affecting treaty relationships, state recognition, dispute settlement, diplomatic relations (including inviolability, non-interference and asylum), consular activities and relations with international organizations.

Prerequisite(s): INAF 5018 (may be taken concurrently).

**INAF 5600 [0.5 credit]****The Economics of Human Development**

The economic analysis and theory of the major areas of human development in developing countries. Topics include demography and population, education, health and nutrition, agriculture, women and development, the financial system and microfinance, the role of institutions.

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School.

**INAF 5602 [0.5 credit]****Development Assistance: Theory and Practice**

Economic, moral, and political arguments for development assistance, aid effectiveness; the role of bilateral and multilateral donors; aid accounting, human development and human rights; NGOs and international assistance.

**INAF 5603 [0.5 credit]****Issues in Development in Africa**

Analysis of structures and processes of political, social, and economic change in intertropical Africa at scales ranging from the intrahousehold and local community to the state and international system. Integration of gender and the environment into analyses which draw on theories of political economy.

**INAF 5604 [0.5 credit]****Issues in Development in Latin America**

Principal development challenges, trends, and policies in the region since 1960, e.g. climate change, poverty, inequality, de-industrialization, urbanization, crime and violence, with gender and racialized minorities as cross-cutting themes.

**INAF 5605 [0.5 credit]****The Ethical Dimension of International Affairs**

Critical examination of ethical approaches to international affairs and an understanding of the importance of individual, state-level and international morality to international policy making.

**INAF 5609 [0.5 credit]****Development Project Evaluation and Analysis**

Examination of social cost-benefit analysis and other micro-economic methods of project evaluation in the context of the project cycle in developing countries with emphasis on policy analysis and implementation practice, case studies of development projects, including those of non-governmental organizations.

**INAF 5610 [0.5 credit]****Fragile States: Theory and Policy**

Introduction to the linkages between state fragility, development, conflict and instability with specific attention given to theory, evidence, analysis and policy. Diagnosis and analysis of fragile states for the purposes of program evaluation and strategic planning.

Includes: Experiential Learning Activity

**INAF 5612 [0.5 credit]****International Development Institutions**

Structure, operations and effects of major international development institutions on international development policy and the development process. Key institutions include the World Bank, and the regional development banks, UNDP, and other public and private institutions.

**INAF 5701 [0.5 credit]****Global Environmental Change: Human Implications**

Global environmental change; its significance for societies, economies and international relations. Value systems underlying environmental discourse; political economy of the environment; sustainability and security. Environmental diplomacy and grassroots environmentalism. Regionalized impacts of pressures on natural environments; challenges of adaptation.

Includes: Experiential Learning Activity

Also listed as GEOG 5005.

**INAF 5702 [0.5 credit]****International Environmental Affairs**

International environmental issues, with a focus on policy options and institutions relevant to addressing these issues. Topics include the relationship between the environment and trade, investment, globalization, development and conflict.

**INAF 5703 [0.5 credit]****International Public Economics**

The application of public economic analysis to the global context, including global public goods, externalities, common resource and environmental problems, and an examination of policy interventions through cooperation and international organizations.

**INAF 5704 [0.5 credit]****Human Security: From Policy to Practice**

Through a theoretical lens and case studies, this course reviews the emergence of the idea of 'human security', its use in international diplomacy, its relationship to state interests, and the factors that facilitated its rise on the international agenda.

Includes: Experiential Learning Activity

**INAF 5705 [0.5 credit]****Global Social Policy**

Engages with the conceptual and analytical underpinnings of the field of 'global social policy'. Highlights the diverse actors and processes that determine if the basic needs of people around the world are met. Thematic areas covered include poverty and inequality, migration, and labour.

**INAF 5706 [0.5 credit]****Global Health Policy**

Analyses the global dimensions of health, including health and diplomacy, multilateral institutions, development, human rights, and security. Develops skills to examine and evaluate international policy responses to global health challenges, such as HIV/AIDS and pandemic influenza.

Includes: Experiential Learning Activity

**INAF 5707 [0.5 credit]****Complex Humanitarian Emergencies**

The causes and consequences of complex humanitarian emergencies, their impact on civilians and the responses of international and national actors. Critical review of policy responses of the international community - including donor governments, multilateral organizations, the military and non-governmental organizations.

Includes: Experiential Learning Activity

**INAF 5708 [0.5 credit]****Humanitarian Assistance: Policies and Issues**

Legal, policy and programming dimensions of humanitarian assistance. Policy responses and good practice; evaluations of donor performance.

**INAF 5709 [0.5 credit]****Human Rights: International Politics and Policies**

Overview of key international human rights policies and debates. Themes include human rights and religion, development, trade, culture, and gender. Readings from applied and scholarly disciplines, focusing on the actions of governments, civil society, development agencies, international organizations and regional bodies.

Also listed as IDMG 5605.

**INAF 5710 [0.5 credit]****Global Governance of Displacement**

Examines key debates related to the global protection of forced migrants, including the definition of a refugee, state responsibility to protect forced migrants, the role of international institutions in guaranteeing their rights, and how forced migrants access protection at local, national and global levels.

**INAF 5711 [0.5 credit]****International Labour Migration**

This course will expose students to a range of issues pertaining to labour migration in the 21st Century. It will focus primarily on trends in temporary labour mobility but will address permanent migration, and consider factors that influence the international movement of such workers.

**INAF 5714 [0.5 credit]****Global Health Security**

This course will explore the concept of global health security, discuss what this concept means for high-income versus low-income countries, examine the varied threats to global health security, and examine the global governance systems required to realize global health security. Includes experiential learning activity.

Includes: Experiential Learning Activity

Precludes additional credit for INAF 5499F (Fall 2023, Winter 2025).

Prerequisite(s): M.A. standing in the Norman Paterson School of International Affairs or permission of the School. Seminar

**INAF 5800 [0.5 credit]****Asia Pacific Economic and Political Relations**

The evolving pattern of economic and political relations in the Asia-Pacific region. Topics will include security issues; trade and investment; and development cooperation; institutional arrangements, including ASEAN, APEC, AFTA, and Canada's role in the regional affairs.

**INAF 5802 [0.5 credit]****The International Political Economy of Transition**

Problems of reintegration into the world economy and dilemmas of transition from command to market economies. Topics may include new trade and investment patterns, role in regional and international economic organizations, search for appropriate exchange rate policies, impact of Western assistance.

Also listed as EURR 5102.

**INAF 5803 [0.5 credit]****European Economic Integration**

Economic issues and policies related to the process of European integration and the development of the post-World War II European Union.

Also listed as EURR 5105.

Prerequisite(s): ECON 1000.

**INAF 5805 [0.5 credit]****The EU in International Affairs**

The impact of the EU on international affairs; the internal development of the EU, the evolution of integration theory, and the growth of the EU's external relations capabilities.

Includes: Experiential Learning Activity

Also listed as EURR 5109.

**INAF 5807 [0.5 credit]****The European Union and its Eastern Neighbours**

The EU's European Neighbourhood Policy and Eastern partnership policy, the Russia-EU "strategic partnership". Policies and reactions of non-EU East European countries toward the EU. The interaction of Member state policies and EU policies. May include historical legacies, cultural factors, public opinion, energy security.

Includes: Experiential Learning Activity

Also listed as EURR 5205, PSCI 5111.

**INAF 5809 [0.5 credit]****Turkey in the International System**

Analysis of topics related to modern Turkey. The course may cover aspects of the Turkish economy, politics and government, foreign policy, and broader regional relations.

**INAF 5901 [0.5 credit]****Tutorials in International Affairs**

To be chosen in consultation with the director.

**INAF 5903 [0.5 credit]****Policy Writing for International Affairs**

Teaching the fundamentals of clear and persuasive public policy writing, this course helps prepare students to write policy documents that have an impact. Course orients students to major writing products used in the policy process and field of international relations, including policy briefs.

Includes: Experiential Learning Activity

**INAF 5904 [0.5 credit]****Quantitative Research Methods**

Introduction to large sample statistical analysis and basic econometrics, using standard software packages to complete an applied individual research project identified by each student with guidance from the instructor. Critical reading skills applied to quantitative research papers.

Precludes additional credit for INAF 6002.

Prerequisite(s): permission of the School.

**INAF 5906 [1.0 credit]****M.A./JD Research Essay**

A research essay that allows an M.A./JD. student to integrate legal and international affairs studies in an analysis of a topic of his or her choice.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School after the submission of a satisfactory proposal and identification of a suitable supervisory team.

**INAF 5908 [1.0 credit]****Research Essay**

A research essay option that allows an M.A. student to apply their international affairs studies to a topic of his or her choice.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School after the submission of a satisfactory proposal and identification of a suitable supervisory team.

**INAF 5909 [2.0 credits]****M.A. Thesis**

A research thesis option that allows a student in the M.A. program to combine original research with international affairs studies in an analysis of a topic of his or her choice.

Prerequisite(s): A- average in all M.A. required courses and a minimum of 3.0 full course credits, permission of the School after the submission of a satisfactory proposal and identification of a suitable supervisory team.

**INAF 5913 [0.0 credit]****Co-operative Work Term**

Includes: Experiential Learning Activity

Prerequisite(s): registration in the Co-operative Education Option of the Master of Arts program.

**INAF 5914 [0.25 credit]****Internship Placement**

Internship students are required to register in this course during their internship work term. Priority for the internship placement will be given to full time, first year students in the MA and MA-JD program.

Includes: Experiential Learning Activity

Prerequisite(s): full-time registration in the NPISA M.A. or M.A.-JD program.

**INAF 5915 [0.5 credit]****Internship Placement**

Applied experience through a placement at an organization working in an area of international affairs or policy. An academic supervisor oversees the placement and related assessments.

Includes: Experiential Learning Activity

Prerequisite(s): Full-time registration in the NPSIA M.A. or M.A.-JD program.

**INAF 5920 [0.5 credit]****Selected Topics in Security and Defence Policy**

Selected Topics in Security and Defence Policy. Topic may vary from year to year.

**INAF 5921 [0.5 credit]****Tutorial in International Affairs**

Prerequisite(s): permission of the School.

**INAF 5922 [0.5 credit]****Tutorial in International Affairs**

Prerequisite(s): permission of the School.

**INAF 6001 [0.5 credit]****Qualitative Research Methods**

Problem statements, research questions and approaches to knowledge acquisition in international affairs, focusing on policy relevance. Topics include advantages and limitations of inductive and deductive research methods, variable selection and hypothesis development, case studies and field research, data gathering, and methodology choice.

Precludes additional credit for INAF 5406.

Prerequisite(s): standing in the NPSIA Ph.D. program or permission of the School.

**INAF 6002 [0.5 credit]****Quantitative Research Methods**

Introduction to large sample statistical analysis and basic econometrics, using standard software packages to complete an applied individual research project related to the doctoral dissertation of each student with guidance from the instructor. Critical reading skills applied to quantitative research papers.

Precludes additional credit for INAF 5904.

Prerequisite(s): standing in the NPSIA Ph.D. program or permission of the School.

**INAF 6003 [0.5 credit]****Advanced International Policy Analysis**

Interdisciplinary analysis of international public policy applying approaches to the policy process taking place within and between states as well as in international organizations.

Precludes additional credit for INAF 5905.

Prerequisite(s): standing in the NPSIA Ph.D. program or permission of the School.

**INAF 6004 [0.5 credit]****Doctoral Comprehensive Examination in Policy and Research Methods**

A comprehensive examination covering the policy and methods material in INAF 6001, INAF 6002, and INAF 6003.

Prerequisite(s): enrolment in the NPSIA Ph.D. program or permission of the School.

**INAF 6005 [0.0 credit]****Doctoral Research Seminar**

This seminar helps to prepare students for their doctoral research by developing a preliminary prospectus question and initial research design, and by identifying a doctoral supervisor. Graded SAT/UNS.

Prerequisite(s): enrolment in the Ph.D. International Affairs.

**INAF 6906 [0.5 credit]****Doctoral Research Prospectus Seminar and Defence**

A seminar to develop the research prospectus, followed by the prospectus defence. Other research issues such as ethics clearance, scholarly articles submission and field work logistics are addressed. Graded SAT/UNS.

Prerequisite(s): Completion of field comprehensive examination and required courses in the NPSIA Ph.D.

**INAF 6909 [0.0 credit]****Doctoral Research Thesis**

The doctoral dissertation, normally supervised by faculty in the Norman Paterson School of International Affairs with the possibility of supervision from faculty in other social sciences departments, schools, and institutes.

Prerequisite(s): completion of all other Ph.D. program requirements in the NPSIA Ph.D. program.

**INAF 6921 [0.5 credit]****Ph.D. Tutorial in International Affairs**

Tutorials or reading courses on selected topics may be arranged with the permission of the supervisor of graduate studies and the approval of the supervising faculty member.

**INAF 6922 [0.5 credit]****Ph.D. Tutorial in International Affairs**

Tutorials or reading courses on selected topics may be arranged with the permission of the supervisor of graduate studies and the approval of the supervising faculty member.

**INAF 6925 [0.5 credit]****Ph.D. Tutorial in International Affairs**

Tutorials or reading courses on selected topics may be arranged with the permission of the supervisor of graduate studies and the approval of the supervising faculty member.

## Journalism

This section presents the requirements for programs in:

- **M. Journalism**
- **M. Journalism with Collaborative Specialization in African Studies**

### Program Requirements

#### M. Journalism (8.0 credits)

##### M. Journalism (Professional Practice pathway)

###### First Year Requirements:

Students must complete the following courses before proceeding to the second year of study:

<b>1. 4.0 credits in:</b>	4.0
JOUR 5000 [0.5]	Journalism in a Changing Society
JOUR 5002 [0.5]	Journalism, Race and Diversity
JOUR 5200 [1.0]	Introduction to Reporting
JOUR 5202 [1.0]	Broadcast Journalism Laboratory
JOUR 5401 [0.5]	Journalism Law
JOUR 5706 [0.5]	In-Depth Reporting Seminar
<b>2. 0.5 credit in</b> electives chosen in consultation with the Supervisor of Graduate Studies	0.5
<b>Second Year Requirements:</b>	
<b>3. 1.0 credit in:</b>	1.0
JOUR 5908 [1.0]	M. Journalism Research Project
<b>4. 0.5 credit in:</b>	0.5
JOUR 5001 [0.5]	Entrepreneurial Journalism
<b>5. 0.5 credit from:</b>	0.5
JOUR 5003 [0.5]	Advanced Journalism: Multimedia
JOUR 5004 [0.5]	Advanced Journalism: Audio
JOUR 5005 [0.5]	Advanced Journalism: Video
<b>6. 0.5 credit from:</b>	0.5
JOUR 5300 [0.5]	Specialized Journalism: Special Topic
JOUR 5301 [0.5]	Specialized Journalism: Business and the Markets
JOUR 5302 [0.5]	Specialized Journalism: Business and Canadian Society
JOUR 5303 [0.5]	Specialized Journalism: Health and Science
JOUR 5304 [0.5]	Specialized Journalism: Environment and Science
JOUR 5306 [0.5]	Specialized Journalism: Canada and the World
JOUR 5308 [0.5]	Specialized Journalism: Sports and Sport Culture
JOUR 5309 [0.5]	Specialized Journalism: Arts and Culture
JOUR 5311 [0.5]	Specialized Journalism: Justice and The Supreme Court
JOUR 5313 [0.5]	Specialized Journalism: Reporting in Indigenous Communities
JOUR 5314 [0.5]	Specialized Journalism: Parliament, Policy and the Press
JOUR 5315 [0.5]	Specialized Journalism: Canada and the U.S.
<b>7. 1.0 credit in</b> electives chosen in consultation with the Supervisor of Graduate Studies	1.0

Note: As a condition of graduation, students normally are required to acquire a minimum of eight weeks practical experience in the media. For qualified applicants, the program may deem the requirement to have been met.

**Total Credits** **8.0**

##### M. Journalism (Journalism Studies pathway)

###### First Year requirements:

Students must complete the following courses before proceeding to the second year of study:

<b>1. 4.0 credits in:</b>	4.0
JOUR 5000 [0.5]	Journalism in a Changing Society
JOUR 5002 [0.5]	Journalism, Race and Diversity
JOUR 5200 [1.0]	Introduction to Reporting
JOUR 5202 [1.0]	Broadcast Journalism Laboratory
JOUR 5401 [0.5]	Journalism Law
JOUR 5706 [0.5]	In-Depth Reporting Seminar
<b>2. 0.5 credit in</b> electives chosen in consultation with the Supervisor of Graduate Studies	0.5
<b>Second Year requirements:</b>	
<b>3. 1.5 credits in</b> electives chosen in consultation with the Supervisor of Graduate Studies	1.5
<b>4. 2.0 credits in:</b>	2.0
JOUR 5909 [2.0]	M. Journalism Thesis

**Total Credits** **8.0**

#### M. Journalism (Advanced entry - 5.0 credits)

##### M. Journalism (Professional Practice pathway, advanced entry)

###### Requirements:

<b>1. 1.0 credit in:</b>	1.0
JOUR 5000 [0.5]	Journalism in a Changing Society
JOUR 5002 [0.5]	Journalism, Race and Diversity
<b>2. 0.5 credit from:</b>	0.5
JOUR 5003 [0.5]	Advanced Journalism: Multimedia
JOUR 5004 [0.5]	Advanced Journalism: Audio
JOUR 5005 [0.5]	Advanced Journalism: Video
<b>3. 0.5 credit from:</b>	0.5
JOUR 5300 [0.5]	Specialized Journalism: Special Topic
JOUR 5301 [0.5]	Specialized Journalism: Business and the Markets
JOUR 5302 [0.5]	Specialized Journalism: Business and Canadian Society
JOUR 5303 [0.5]	Specialized Journalism: Health and Science
JOUR 5304 [0.5]	Specialized Journalism: Environment and Science
JOUR 5306 [0.5]	Specialized Journalism: Canada and the World
JOUR 5308 [0.5]	Specialized Journalism: Sports and Sport Culture
JOUR 5309 [0.5]	Specialized Journalism: Arts and Culture
JOUR 5311 [0.5]	Specialized Journalism: Justice and The Supreme Court
JOUR 5313 [0.5]	Specialized Journalism: Reporting in Indigenous Communities
JOUR 5314 [0.5]	Specialized Journalism: Parliament, Policy and the Press

JOUR 5315 [0.5]	Specialized Journalism: Canada and the U.S.	
<b>4. 2.0 credits in</b>	electives chosen in consultation with the Supervisor of Graduate Studies	2.0
<b>5. 1.0 credit in:</b>		1.0
JOUR 5908 [1.0]	M. Journalism Research Project	
Note: As a condition of graduation, students normally are required to acquire a minimum of eight weeks practical experience in the media. For qualified applicants, the program may deem the requirement to have been met.		
<b>Total Credits</b>		<b>5.0</b>

#### **M. Journalism (Journalism Studies pathway, advanced entry)**

##### **Requirements:**

<b>1. 1.0 credit in:</b>		1.0
JOUR 5000 [0.5]	Journalism in a Changing Society	
JOUR 5002 [0.5]	Journalism, Race and Diversity	
<b>2. 2.0 credits in</b>	chosen in consultation with the Supervisor of Graduate Studies	2.0
<b>3. 2.0 credits in:</b>		2.0
JOUR 5909 [2.0]	M. Journalism Thesis	
<b>Total Credits</b>		<b>5.0</b>

#### **M. Journalism with Collaborative Specialization in African Studies (8.0 credits)**

##### **M. Journalism with Collaborative Specialization in African Studies (Professional Practice pathway)**

##### **First Year requirements:**

Students must complete the following courses before proceeding to the second year of study:

<b>1. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 4.0 credits in:</b>		4.0
JOUR 5000 [0.5]	Journalism in a Changing Society	
JOUR 5002 [0.5]	Journalism, Race and Diversity	
JOUR 5200 [1.0]	Introduction to Reporting	
JOUR 5202 [1.0]	Broadcast Journalism Laboratory	
JOUR 5401 [0.5]	Journalism Law	
JOUR 5706 [0.5]	In-Depth Reporting Seminar	
<b>4. 0.5 credit in</b>	approved African Studies electives	0.5
<b>5. 0.5 credit in</b>	electives chosen in consultation with the Supervisor of Graduate Studies	0.5

##### **Second Year requirements:**

<b>6. 1.0 credit in:</b>		1.0
JOUR 5908 [1.0]	M. Journalism Research Project (in the specialization)	
<b>7. 0.5 credit in:</b>		0.5
JOUR 5001 [0.5]	Entrepreneurial Journalism	
<b>8. 0.5 credit from:</b>		0.5
JOUR 5003 [0.5]	Advanced Journalism: Multimedia	
JOUR 5004 [0.5]	Advanced Journalism: Audio	
JOUR 5005 [0.5]	Advanced Journalism: Video	
<b>9. 0.5 credit from:</b>		0.5

JOUR 5300 [0.5]	Specialized Journalism: Special Topic	
JOUR 5301 [0.5]	Specialized Journalism: Business and the Markets	
JOUR 5302 [0.5]	Specialized Journalism: Business and Canadian Society	
JOUR 5303 [0.5]	Specialized Journalism: Health and Science	
JOUR 5304 [0.5]	Specialized Journalism: Environment and Science	
JOUR 5306 [0.5]	Specialized Journalism: Canada and the World	
JOUR 5308 [0.5]	Specialized Journalism: Sports and Sport Culture	
JOUR 5309 [0.5]	Specialized Journalism: Arts and Culture	
JOUR 5311 [0.5]	Specialized Journalism: Justice and The Supreme Court	
JOUR 5313 [0.5]	Specialized Journalism: Reporting in Indigenous Communities	
JOUR 5314 [0.5]	Specialized Journalism: Parliament, Policy and the Press	
JOUR 5315 [0.5]	Specialized Journalism: Canada and the U.S.	

Note: As a condition of graduation, students normally are required to acquire a minimum of eight weeks practical experience in the media. For qualified applicants, the program may deem the requirement to have been met.

**Total Credits** **8.0**

##### **M. Journalism with Collaborative Specialization in African Studies (Journalism Studies pathway)**

##### **First Year requirements:**

Students must complete the following courses before proceeding to the second year of study:

<b>1. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 4.0 credits in:</b>		4.0
JOUR 5000 [0.5]	Journalism in a Changing Society	
JOUR 5002 [0.5]	Journalism, Race and Diversity	
JOUR 5200 [1.0]	Introduction to Reporting	
JOUR 5202 [1.0]	Broadcast Journalism Laboratory	
JOUR 5401 [0.5]	Journalism Law	
JOUR 5706 [0.5]	In-Depth Reporting Seminar	

**4. 0.5 credit in** electives chosen in consultation with the Supervisor of Graduate Studies **0.5**

##### **Second Year requirements:**

<b>5. 1.0 credits in</b>	electives chosen in consultation with the Supervisor of Graduate Studies	1.0
<b>6. 2.0 credits in:</b>		2.0
JOUR 5909 [2.0]	M. Journalism Thesis (in the specialization)	

**Total Credits** **8.0**

## M. Journalism with Collaborative Specialization in African Studies (Advanced entry - 5.0 credits)

### M. Journalism with Collaborative Specialization in African Studies (Professional Practice pathway, advanced entry)

#### Requirements:

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 1.0 credit in:</b>	1.0
JOUR 5000 [0.5]	Journalism in a Changing Society
JOUR 5002 [0.5]	Journalism, Race and Diversity
<b>4. 0.5 credit from:</b>	0.5
JOUR 5003 [0.5]	Advanced Journalism: Multimedia
JOUR 5004 [0.5]	Advanced Journalism: Audio
JOUR 5005 [0.5]	Advanced Journalism: Video
<b>5. 0.5 credit from:</b>	0.5
JOUR 5300 [0.5]	Specialized Journalism: Special Topic
JOUR 5301 [0.5]	Specialized Journalism: Business and the Markets
JOUR 5302 [0.5]	Specialized Journalism: Business and Canadian Society
JOUR 5303 [0.5]	Specialized Journalism: Health and Science
JOUR 5304 [0.5]	Specialized Journalism: Environment and Science
JOUR 5306 [0.5]	Specialized Journalism: Canada and the World
JOUR 5308 [0.5]	Specialized Journalism: Sports and Sport Culture
JOUR 5309 [0.5]	Specialized Journalism: Arts and Culture
JOUR 5311 [0.5]	Specialized Journalism: Justice and The Supreme Court
JOUR 5313 [0.5]	Specialized Journalism: Reporting in Indigenous Communities
JOUR 5314 [0.5]	Specialized Journalism: Parliament, Policy and the Press
JOUR 5315 [0.5]	Specialized Journalism: Canada and the U.S.
<b>6. 1.5 credits in</b> electives chosen in consultation with the Supervisor of Graduate Studies	1.5
<b>7. 1.0 credit in:</b>	1.0
JOUR 5908 [1.0]	M. Journalism Research Project (in the specialization)

Note: As a condition of graduation, students normally are required to acquire a minimum of eight weeks practical experience in the media. For qualified applicants, the program may deem the requirement to have been met.

**Total Credits** 5.0

### M. Journalism with Collaborative Specialization in African Studies (Journalism Studies pathway, advanced entry)

#### Requirements:

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 0.5 credit in:</b>	0.5
JOUR 5000 [0.5]	Journalism in a Changing Society
<b>4. 2.0 credits in</b> electives chosen in consultation with the Supervisor of Graduate Studies	2.0
<b>5. 2.0 credits in:</b>	2.0
JOUR 5909 [2.0]	M. Journalism Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

## Regulations

See the General Regulations section of this Calendar.

## Admission

### M. Journalism

The School of Journalism and Communication provides two points of entry into the Master of Journalism program – Year One or Year Two.

Most applicants will be admitted to Year One of the two-year M.Journalism program; however, some may qualify for admission to Year Two. A committee chaired by the Supervisor of Graduate Studies will determine the admissibility of each applicant.

For admission to Year One of the M.Journalism program, applicants must hold an honour's bachelor's degree or the equivalent, with, normally, B+ or better in the honours subject and B- or higher overall.

A limited number of spaces will be made available for direct admission to Year Two of the M. Journalism program. Students must normally possess one of the following qualifications to be considered for this admission option:

- a B.Journalism (Honours) or the equivalent;
- a degree in another discipline from a recognized university plus at least five years of professional experience in journalism;
- substantial professional journalism experience of a high standard.

Note: Students with prior journalistic experience or credentials who are admitted directly into Year Two will normally pursue the Journalism Studies completion option, or a path of coursework selected in consultation with the Supervisor of Graduate Studies, which will include a thesis or master's research project, as appropriate.

Admission will be selective. Admission will not be guaranteed to all who meet the published minimum requirements, as there are many more qualified applicants each year than there are available spaces.

Proficiency in English is necessary to pursue graduate studies at Carleton University. Journalism demands higher levels of competence in English than specified in the general regulations of the graduate calendar.

All applicants whose first language is not English must satisfy this requirement by meeting one of the following criteria:

1. An official overall score of 70 on the Canadian Academic English Language (CAEL) Assessment; or
2. An official Test of English as a Foreign Language (TOEFL) score of 600 on the paper-based test (PBT), or an overall score of 100 on the Internet-based test (IBT) with a minimum score in each component of: writing 25; speaking 25; reading 25; and listening 25; or
3. An official overall international English Language Testing System (IELTS) score of 7.0 with a minimum of 7.0 in each band score; or
4. Official certification (transcripts) to indicate that they have completed an undergraduate or graduate degree within the past three years in a university in Canada, the United States, the United Kingdom or any other country in which the primary language is English, and where the language of instruction in the relevant education institution was exclusively English.

The Vice Provost (Graduate Studies) reserves the right to require further documentation or additional testing if it deems it is necessary to demonstrate the required level of English language proficiency.

### **M. Journalism with Specialization in African Studies**

Information about admission to the M. Journalism with Specialization in African Studies can be found at [carleton.ca/africanstudies/graduate-studies/admissions](http://carleton.ca/africanstudies/graduate-studies/admissions)

### **Journalism (JOUR) Courses**

#### **JOUR 5000 [0.5 credit]**

##### **Journalism in a Changing Society**

Analysis of the news media in Western society, considering arguments and trends in the scholarly assessment of journalistic practice.

#### **JOUR 5001 [0.5 credit]**

##### **Entrepreneurial Journalism**

Workshop preparing students to work in a diverse market that values entrepreneurial skills and mindset, from freelancing to starting your own venture.  
Includes: Experiential Learning Activity

#### **JOUR 5002 [0.5 credit]**

##### **Journalism, Race and Diversity**

Seminar to examine the media's role in race and diversity and how inclusive reporting enriches journalism.  
Includes: Experiential Learning Activity

#### **JOUR 5003 [0.5 credit]**

##### **Advanced Journalism: Multimedia**

Designed to enhance storytelling, reporting and editing skills through the production of a digital publication.

Includes: Experiential Learning Activity

Precludes additional credit for JOUR 5704 (no longer offered), JOUR 5705 (no longer offered), JOUR 5701 (no longer offered).

Also offered at the undergraduate level, with different requirements, as JOUR 4003, for which additional credit is precluded.

#### **JOUR 5004 [0.5 credit]**

##### **Advanced Journalism: Audio**

Designed to enhance audio storytelling and reporting/producing skills through the production of a weekly program.

Includes: Experiential Learning Activity

Precludes additional credit for JOUR 5707 (no longer offered), JOUR 5703 (no longer offered).

Also offered at the undergraduate level, with different requirements, as JOUR 4004, for which additional credit is precluded.

#### **JOUR 5005 [0.5 credit]**

##### **Advanced Journalism: Video**

Designed to enhance video storytelling skills through the production of a series of mini-documentaries for a digital program.

Includes: Experiential Learning Activity

Precludes additional credit for JOUR 5708 (no longer offered), JOUR 5703 (no longer offered).

Also offered at the undergraduate level, with different requirements, as JOUR 4005, for which additional credit is precluded.

#### **JOUR 5200 [1.0 credit]**

##### **Introduction to Reporting**

An intensive laboratory course in introductory reporting and editing, with emphasis on text and multimedia journalism.

Includes: Experiential Learning Activity

#### **JOUR 5202 [1.0 credit]**

##### **Broadcast Journalism Laboratory**

A laboratory course that teaches the fundamentals of audio and video reporting and editing.

Includes: Experiential Learning Activity

**JOUR 5208 [0.5 credit]****Public Affairs Reporting**

A course devoted to understanding selected political, economic and social issues, and to analytical reporting on timely issues under professional conditions.

Includes: Experiential Learning Activity

**JOUR 5300 [0.5 credit]****Specialized Journalism: Special Topic**

Advanced reporting in a specialized subject area.

Topics may vary from year to year. Emphasis on subject exploration from a journalistic perspective. Involves the production of in-depth journalism.

Also offered at the undergraduate level, with different requirements, as JOUR 4300, for which additional credit is precluded.

**JOUR 5301 [0.5 credit]****Specialized Journalism: Business and the Markets**

The fundamentals of business journalism, including corporate structures, the markets, trade policy, contemporary business news and local publicly-traded companies. Emphasis on advanced subject exploration from a journalistic perspective. Involves the production of in-depth journalism.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4301, for which additional credit is precluded.

**JOUR 5302 [0.5 credit]****Specialized Journalism: Business and Canadian Society**

How business affects every aspect of public policy, from climate change to corporate social responsibility.

What business does and how the media covers it.

Emphasis on advanced subject exploration from a journalistic perspective. Involves the production of in-depth journalism.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4302, for which additional credit is precluded.

**JOUR 5303 [0.5 credit]****Specialized Journalism: Health and Science**

How health science research permeates everyday life.

Global challenges confronting researchers and health science journalists. Emphasis on advanced subject exploration from a journalistic perspective. Involves the production of in-depth journalism.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4303, for which additional credit is precluded.

**JOUR 5304 [0.5 credit]****Specialized Journalism: Environment and Science**

Analysis of global trends and research culture in climate and environmental sciences. Challenges confronting researchers and journalists. Emphasis on advanced subject exploration from a journalistic perspective.

Involves the production of in-depth journalism.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4304, for which additional credit is precluded.

**JOUR 5306 [0.5 credit]****Specialized Journalism: Canada and the World**

Canada's role in the world as shaped by diplomacy, war, terrorism, migration, the international economy and development. Emphasis on advanced subject exploration from a journalistic perspective. Involves the production of in-depth journalism.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4306, for which additional credit is precluded.

**JOUR 5308 [0.5 credit]****Specialized Journalism: Sports and Sport Culture**

Beyond game scores—analysis of the culture of sports and evolution of sports reportage and writing.

Emphasis on advanced subject exploration from a journalistic perspective. Involves the production of in-depth journalism.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4308, for which additional credit is precluded.

**JOUR 5309 [0.5 credit]****Specialized Journalism: Arts and Culture**

An introduction to the crucial issues and trends necessary for reporters covering the arts and related cultural policy in Canada. Emphasis on advanced subject exploration from a journalistic perspective. Involves the production of in-depth journalism.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4309, for which additional credit is precluded.

**JOUR 5311 [0.5 credit]****Specialized Journalism: Justice and The Supreme Court**

Students will focus on the Supreme Court of Canada as they learn to navigate court documents and tell impactful stories about court cases and legal issues. Emphasis on advanced subject exploration from a journalistic perspective and production of in-depth journalism.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4311, for which additional credit is precluded.

**JOUR 5313 [0.5 credit]****Specialized Journalism: Reporting in Indigenous Communities**

Working in teams to produce multimedia news stories from Indigenous communities in the city of Ottawa and Ottawa Valley region, students will be challenged to confront misrepresentation in the news media and learn to consider new strategies and ethical frameworks for covering Indigenous Peoples.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4313, for which additional credit is precluded.

3 hours per week.

**JOUR 5314 [0.5 credit]****Specialized Journalism: Parliament, Policy and the Press**

This seminar course is designed to make students familiar with the way government works; how political parties function within the overall political system; how policies are formulated and implemented; and most importantly, how to report on all of these processes, institutions and events.

Also offered at the undergraduate level, with different requirements, as JOUR 4314, for which additional credit is precluded.

3 hours per week.

**JOUR 5315 [0.5 credit]****Specialized Journalism: Canada and the U.S.**

Fundamentals of the unique issues governing Canada-U.S. relations, from diplomacy to trade. Emphasis on advanced subject exploration from a journalistic perspective. Involves the production of in-depth journalism.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as JOUR 4305, for which additional credit is precluded.

**JOUR 5401 [0.5 credit]****Journalism Law**

This course prepares journalists to function comfortably within the legal and ethical guidelines governing their occupation. Topics include: contempt of court; free press, fair trial; revealing of sources; civil defamation; obscenity; privacy; government secrecy.

**JOUR 5508 [0.5 credit]****Professional Practices: Specialized Media**

A workshop course designed to give students instruction in specialized areas. Not all specialties will be offered each year.

Includes: Experiential Learning Activity

**JOUR 5702 [1.0 credit]****Broadcast Journalism**

A seminar combining critical analysis of broadcast journalism and practical skill development in broadcast reporting, writing and production.

Includes: Experiential Learning Activity

**JOUR 5706 [0.5 credit]****In-Depth Reporting Seminar**

Students will complete a piece of longform analytical journalism, discuss in-depth writing and reporting techniques and submit a draft proposal for their Master's Research Project.

Includes: Experiential Learning Activity

**JOUR 5709 [0.5 credit]****Creative Non-fiction**

Students will explore and experiment with advanced writing techniques through a combination of readings, discussion and assignments.

Includes: Experiential Learning Activity

**JOUR 5808 [0.5 credit]****Directed Readings**

Students, working under faculty direction, will undertake an intensive reading schedule in order to pursue a subject area of particular interest.

**JOUR 5809 [0.5 credit]****Directed Research**

Students, working under faculty direction, will develop and undertake a research project in order to pursue a subject area of particular interest.

Includes: Experiential Learning Activity

**JOUR 5900 [1.0 credit]****Directed Studies**

Reading and research tutorials.

**JOUR 5901 [0.5 credit]**  
**Directed Studies**  
 Reading and research tutorials.

**JOUR 5908 [1.0 credit]**  
**M. Journalism Research Project**  
 Students will complete a substantial piece of public affairs journalism in the format of their choice: text, audio, video or multimedia; or do a research project that examines media practice or makes a major contribution to journalism education.  
 Includes: Experiential Learning Activity

**JOUR 5909 [2.0 credits]**  
**M. Journalism Thesis**  
 To fulfil the requirements of this 2.0-credit thesis course, students must produce a major piece of journalistic research or complete an academic thesis in the area of journalism studies.  
 Includes: Experiential Learning Activity

## Latin American and Caribbean Studies (Collaborative Specialization)

This section presents the requirements for programs in:

- **M. A. Anthropology with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. Communication with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. Geography with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. History with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. International Affairs with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. Legal Studies with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. Migration and Diaspora Studies with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. Political Economy with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. Political Science with Specialization in Latin American and Caribbean Studies**
- **M.A. Sociology with Collaborative Specialization in Latin American and Caribbean Studies**
- **M.A. Women's and Gender Studies with Collaborative Specialization in Latin American and Caribbean Studies**

### Program Requirements

<b>M. A. Anthropology with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)</b>		
<b>Requirements - Thesis pathway:</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
ANTH 5401 [0.5]	Theory in Anthropology	
ANTH 5402 [0.5]	Research in Anthropology	
<b>4. 1.5 credits in electives</b>		<b>1.5</b>
<b>5. 2.0 credits in:</b>		<b>2.0</b>
ANTH 5909 [2.0]	M.A. Thesis (on an approved topic with significant content related to Latin American and Caribbean Studies. )	
<b>Total Credits</b>		<b>5.0</b>

**Requirements - Research essay pathway:**

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
ANTH 5401 [0.5]	Theory in Anthropology	
ANTH 5402 [0.5]	Research in Anthropology	
<b>4. 2.5 credits in</b>	<b>electives</b>	<b>2.5</b>
<b>5. 1.0 credit in:</b>		1.0
ANTH 5908 [1.0]	M.A. Research Essay (on an approved topic with significant content related to Latin American and Caribbean Studies)	
<b>Total Credits</b>		<b>5.0</b>

**Requirements - Coursework pathway:**

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
ANTH 5401 [0.5]	Theory in Anthropology	
ANTH 5402 [0.5]	Research in Anthropology	
<b>4. 0.5 credit from:</b>		0.5
ANTH 5109 [0.5]	Ethnography of Gender	
ANTH 5208 [0.5]	Anthropology of Indigeneity	
ANTH 5355 [0.5]	Anthropology of Natural Resources	
ANTH 5560 [0.5]	Economic Anthropology	
ANTH 5570 [0.5]	Political Anthropology	
ANTH 5809 [0.5]	Special Topics in the Anthropology of Development	
<b>5. 3.0 credits in</b>	<b>electives including 0.5 credit in course(s) designated as having sufficient Latin American and Caribbean Studies content, approved by both the Graduate Supervisor and the Coordinator of Latin American and Caribbean Studies.</b>	<b>3.0</b>
<b>Total Credits</b>		<b>5.0</b>

### M.A. Communication with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

**Requirements - Research essay pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
COMS 5101 [1.0]	Foundations of Communication Studies	
<b>4. 0.5 credit in:</b>		0.5

COMS 5605 [0.5] Approaches to Communication Research

<b>5. 1.0 credit in:</b>		1.0
COMS 5908 [1.0]	Research Essay (in the specialization)	
<b>6. 2.0 credits from</b>	<b>the list of optional courses</b>	<b>2.0</b>
<b>Total Credits</b>		<b>5.0</b>

**Requirements - Thesis pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
COMS 5101 [1.0]	Foundations of Communication Studies	
<b>4. 0.5 credit in:</b>		0.5
COMS 5605 [0.5]	Approaches to Communication Research	
<b>5. 2.0 credits in:</b>		2.0
COMS 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>6. 1.0 credit from</b>	<b>the list of optional courses</b>	<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>

### M.A. Geography with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

**Requirements - Thesis pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
GEOG 5000 [0.5]	Approaches to Geographical Inquiry	
GEOG 5905 [0.5]	Masters Research Workshop	
<b>4. 2.5 credits in:</b>		2.5
GEOG 5909 [2.5]	M.A. Thesis (in the specialization and including oral examination of the thesis)	
<b>5. 1.0 credit in</b>	<b>approved graduate-level electives</b>	<b>1.0</b>
6. In addition to the formal requirements, MA students are required to attend the Departmental Seminar series, and the Graduate Field Camp.		
<b>Total Credits</b>		<b>5.0</b>

### M.A. History with Collaborative Specialization in Latin American and Caribbean Studies (4.5 credits)

**Requirements - Research Essay pathway (4.5 credits)**

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	

<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0] Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 0.5 credit in:</b>	0.5
HIST 5003 [0.5] Historical Theory and Method	
<b>4. 2.0 credits in HIST</b> at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	2.0
<b>5. 0.5 credit in:</b>	0.5
HIST 5900 [0.5] Directed Research	
<b>6. 1.0 credit in:</b>	1.0
HIST 5908 [1.0] M.A. Research Essay (in the specialization)	

**Total Credits** **4.5**

#### Requirements - Thesis pathway (4.5 credits)

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5] Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0] Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 0.5 credit in:</b>	0.5
HIST 5003 [0.5] Historical Theory and Method	
<b>4. 1.5 credits in HIST</b> at the graduate level at Carleton; up to 1.0 credit may be taken in designated public history courses; with departmental permission, up to 0.5 credit of courses with historical content may be taken from another unit at Carleton University, at the University of Ottawa, or at another accredited institution.	1.5
<b>5. 2.0 credits in:</b>	2.0
HIST 5909 [2.0] M.A. Thesis (in the specialization)	
<b>Total Credits</b>	<b>4.5</b>

### M.A. International Affairs with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5] Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0] Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.5 credits in:</b>	1.5
INAF 5015 [0.5] Research Design and Methods for International Affairs	
INAF 5016 [0.5] Statistical Analysis for International Affairs	
INAF 5017 [0.25] International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25] Law and International Affairs	
<b>4. 0.5 credit in ECON</b> , successfully completed by the end of the second term, from (See Note 1, below):	0.5
INAF 5009 [0.5] International Aspects of Economic Development	

INAF 5205 [0.5] Economics of Conflict	
INAF 5214 [0.5] Economics for Defence and Security	
INAF 5308 [0.5] International Trade: Theory and Policy	
INAF 5309 [0.5] International Finance: Theory and Policy	
INAF 5600 [0.5] The Economics of Human Development	
INAF 5703 [0.5] International Public Economics	
<b>5. 2.0 credits in:</b>	2.0
INAF 5909 [2.0] M.A. Thesis (M.A. Thesis on an approved topic with significant content related to Latin American and Caribbean Studies, and under the supervision or co-supervision of a faculty member approved by the Graduate Supervisor of the LACS program.)	

**6. 0.5 credit in:** Field and Elective courses (see Note 2, below)

**7. Successful completion of second language proficiency examination** (See Note 3, below)

**Total Credits** **5.0**

#### Requirements - Research Essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5] Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0] Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.5 credits in:</b>	1.5
INAF 5015 [0.5] Research Design and Methods for International Affairs	
INAF 5016 [0.5] Statistical Analysis for International Affairs	
INAF 5017 [0.25] International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25] Law and International Affairs	
<b>4. 0.5 credit in economics</b> , successfully completed by the end of the second term, from: (See Note 1, below)	0.5
INAF 5009 [0.5] International Aspects of Economic Development	
INAF 5214 [0.5] Economics for Defence and Security	
INAF 5205 [0.5] Economics of Conflict	
INAF 5308 [0.5] International Trade: Theory and Policy	
INAF 5309 [0.5] International Finance: Theory and Policy	
INAF 5600 [0.5] The Economics of Human Development	
INAF 5703 [0.5] International Public Economics	
<b>5. 1.0 credit in:</b>	1.0

INAF 5908 [1.0]	Research Essay (on an approved topic with significant content related to Latin American and Caribbean Studies, and under the supervision or co-supervision of a faculty member approved by the Graduate Supervisor of the LACS program.)	
<b>6. 1.5 credits in:</b>	Field and Elective courses (See Note 2, below)	1.5
<b>7.</b>	Successful completion of second language proficiency examination (see Note 3, below)	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Coursework pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
INAF 5016 [0.5]	Statistical Analysis for International Affairs	
INAF 5017 [0.25]	International Policymaking in Canada: Structure and Process	
INAF 5018 [0.25]	Law and International Affairs	
<b>4. 0.5 credit in</b>	economics, successfully completed by the end of the second term, from: (See Note 1, below)	0.5
INAF 5009 [0.5]	International Aspects of Economic Development	
INAF 5205 [0.5]	Economics of Conflict	
INAF 5214 [0.5]	Economics for Defence and Security	
INAF 5308 [0.5]	International Trade: Theory and Policy	
INAF 5309 [0.5]	International Finance: Theory and Policy	
INAF 5600 [0.5]	The Economics of Human Development	
INAF 5703 [0.5]	International Public Economics	
<b>5. 1.0 credit in</b>	courses accepted by the Latin American and Caribbean Studies Program Graduate Coordinator as having sufficient regional content and accepted by the NPSIA M.A. Program Supervisor or Associate Director as being relevant to the student's program of study.	1.0
<b>6. 2.0 credits in</b>	Field and Elective courses (See Note 2, below)	2.0
<b>7.</b>	Successful completion of second language proficiency examination (see Note 3, below)	
<b>Total Credits</b>		<b>5.0</b>

#### Notes:

1. All students must complete the 0.5 credit economics course for their designated field, or an approved alternate economics course. For students in the IEP field both INAF 5308 and INAF 5309, or approved equivalent, must be completed.
2. For elective courses, 1.5 credits of the total required 5.0 credits may be selected from courses offered in other departments, with a maximum of 1.0 credit from a single department and a maximum of 1.0 credit

selected from fourth year undergraduate courses. Any course not identified as an INAF 5000-level course must be approved by the M.A. Program Supervisor.

3. Students must successfully complete an examination in second language proficiency administered by Carleton University's School of Linguistics and Language Studies, or meet the equivalent standard as determined by the School of Linguistics and Language Studies. There is an administrative fee for the standard test (which leads to a certificate of language proficiency after successful completion). Details of the language requirement are provided on the School website.

### M.A. Legal Studies with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 1.0 credit in:</b>		1.0
LAWS 5000 [0.5]	Theories of Law and Social Transformation	
LAWS 5001 [0.5]	Legal Method and Social Inquiry	
<b>3. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>4. 1.5 credits in LAWS</b>		1.5
<b>5. 2.0 credits in:</b>		2.0
LAWS 5909 [2.0]	M.A. Thesis (in the specialization. Includes an oral examination)	
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
LAWS 5000 [0.5]	Theories of Law and Social Transformation	
LAWS 5001 [0.5]	Legal Method and Social Inquiry	
<b>4. 2.5 credits in LAWS</b>		2.5
<b>5. 1.0 credit in:</b>		1.0
LAWS 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0

LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
LAWS 5000 [0.5]	Theories of Law and Social Transformation	
LAWS 5001 [0.5]	Legal Method and Social Inquiry	
<b>4. 2.5 credits in LAWS</b>		<b>2.5</b>
<b>5. 1.0 credit in</b>	course(s) designated as having sufficient Latin American and/or Caribbean Studies content, approved by both LAWS Graduate Supervisor and the Coordinator of Latin American and Caribbean Studies	<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Migration and Diaspora Studies with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)**

#### **Requirements - Thesis Pathway:**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
MGDS 5001 [0.5]	MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5]	Research Seminar in Migration and Diaspora Studies	
<b>4. 0.5 credit in</b>	MGDS at the 5000 level. May not include MGDS 5101.	<b>0.5</b>
<b>5. 1.0 credits from</b>	Migration and Diaspora Studies electives list (see below). Up to 0.5 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	<b>1.0</b>
<b>6. 2.0 credits in:</b>		<b>2.0</b>
MGDS 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research Essay Pathway:**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
MGDS 5001 [0.5]	MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5]	Research Seminar in Migration and Diaspora Studies	
<b>4. 0.5 credit in</b>	MGDS at the 5000 level. May not include MGDS 5101.	<b>0.5</b>
<b>5. 2.0 credits from</b>	Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	<b>2.0</b>
<b>6. 1.0 credit in:</b>		<b>1.0</b>

MGDS 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Coursework Pathway:**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
MGDS 5001 [0.5]	MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5]	Research Seminar in Migration and Diaspora Studies	
<b>4. 0.5 credit in</b>	MGDS at the 5000 level. May not include MGDS 5101.	<b>0.5</b>
<b>5. 2.0 credits from</b>	Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	<b>2.0</b>
<b>6. 1.0 credits in</b>	course(s) designated as having sufficient Latin American and Caribbean Studies content, approved by both the Graduate Supervisor and the Coordinator of Latin American and Caribbean Studies.	<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Political Economy with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
PECO 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>5. 1.5 credits in</b>	approved graduate level electives (see Selection of Courses, below) <sup>1</sup>	<b>1.5</b>
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research essay pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 1.0 credits in:</b>		<b>1.0</b>

PECO 5908 [1.0]	Research Essay (in the specialization)	
<b>5. 2.5 credits in</b>	approved graduate level electives (see Selection of Courses, below) <sup>1</sup>	2.5
<b>Total Credits</b>		<b>5.0</b>

<sup>1</sup> Up to one (1.0) credit may be taken at the 4000 (honours undergraduate) level.

### M.A. Political Science with Specialization in Latin American and Caribbean Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 2.0 credits in:</b>		2.0
PSCI 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>4. 2.5 credits in</b>	electives at the 5000-level, as approved by the graduate supervisor	2.5
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
PSCI 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>4. 3.5 credits in</b>	electives at the 5000-level, as approved by the graduate supervisor	3.5
<b>Total Credits</b>		<b>5.0</b>

### M.A. Sociology with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

#### Requirements - Thesis pathway:

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>4. 1.5 credits in</b>	electives	1.5
<b>5. 2.0 credits in:</b>		2.0

SOCI 5909 [2.0]	M.A. Thesis (on an approved topic with significant content related to Latin American and Caribbean Studies)	
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Research Essay pathway:

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>4. 2.5 credits in</b>	electives	2.5
<b>5. 1.0 credit in:</b>		1.0
SOCI 5908 [1.0]	M.A. Research Essay (on an approved topic with significant content related to Latin American and Caribbean Studies)	
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Coursework pathway:

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>4. 0.5 credit from:</b>		0.5
ANTH 5109 [0.5]	Ethnography of Gender	
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies	
SOCI 5409 [0.5]	The Politics of Social Movements and the State	
<b>5. 3.0 credits in</b>	electives, including 0.5 credit in course(s) designated as having sufficient Latin American and Caribbean Studies content, approved by both the Graduate Supervisor and the Coordinator of Latin American and Caribbean Studies	3.0
<b>Total Credits</b>		<b>5.0</b>

### M.A. Women's and Gender Studies with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0

LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
WGST 5900 [0.5]	Program Seminar	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
WGST 5906 [0.5]	Feminist Theory	
WGST 5907 [0.5]	Researching Women's and Gender Issues	
<b>5. 1.0 credits in</b>	<b>electives</b>	<b>1.0</b>
<b>6. 2.0 credits in:</b>		<b>2.0</b>
WGST 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
WGST 5900 [0.5]	Program Seminar	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
WGST 5906 [0.5]	Feminist Theory	
WGST 5907 [0.5]	Researching Women's and Gender Issues	
<b>5. 2.0 credits in</b>	<b>electives</b>	<b>2.0</b>
<b>7. 1.0 credit in:</b>		<b>1.0</b>
WGST 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

## Regulations

See the General Regulations section of this Calendar and the regulations of the participating unit.

## Admission

Admission to the collaborative master's program in Latin American and Caribbean Studies is available to master's students who are admitted in one of the participating master's programs. To apply to one of the participating master's programs, please visit the Graduate Studies Admissions page.

## Latin American and Caribbean Studies (LACS) Courses

### LACS 5000 [0.5 credit]

#### Interdisciplinary Approaches to Latin American and Caribbean Studies

An interdisciplinary overview of social and political thought in Latin America and the Caribbean.

### LACS 5800 [0.0 credit]

#### Scholarly Preparation in Latin American and Caribbean Studies

Scholarly preparation in Latin American and Caribbean Studies by requiring participation in public talks and methodology workshops.

## Legal Studies

This section presents the requirements for programs in:

- **M.A. Legal Studies**
- **M.A. Legal Studies with Collaborative Specialization in Accessibility**
- **M.A. Legal Studies with Collaborative Specialization in African Studies**
- **M.A. Legal Studies with Collaborative Specialization in Latin American and Caribbean Studies**
- **Ph.D. Legal Studies**
- **Ph.D. Legal Studies with Collaborative Specialization in Political Economy**

### Program Requirements

#### M.A. Legal Studies (5.0 credits)

##### Requirements - Thesis option (5.0 credits)

1. 2.0 credits in LAWS	2.0
2. 1.0 credit in:	1.0
LAWS 5000 [0.5] Theories of Law and Social Transformation	
LAWS 5001 [0.5] Legal Method and Social Inquiry	
3. 2.0 credits in:	2.0
LAWS 5909 [2.0] M.A. Thesis	
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Research essay option (5.0 credits)

1. 3.0 credits in LAWS	3.0
2. 1.0 credit in:	1.0
LAWS 5000 [0.5] Theories of Law and Social Transformation	
LAWS 5001 [0.5] Legal Method and Social Inquiry	
3. 1.0 credit in:	1.0
LAWS 5908 [1.0] M.A. Research Essay	
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Course option (5.0 credits)

1. 4.0 credits in LAWS	4.0
2. 1.0 credits in:	1.0
LAWS 5000 [0.5] Theories of Law and Social Transformation	
LAWS 5001 [0.5] Legal Method and Social Inquiry	
<b>Total Credits</b>	<b>5.0</b>

#### Selection of Courses in Related Disciplines

In addition to the graduate courses offered by the Department of Law and Legal Studies, students in the M.A. program are encouraged to take at least 0.5 credit in a related discipline, in consultation with the supervisor of graduate studies.

Students can propose taking a graduate level course from any department in the University but the following disciplines tend to provide courses of particular interest to Legal Studies students: Economics, Geography, History, Indigenous and Canadian Studies, International Affairs, Journalism and Communication, Political Science, Psychology, Public Administration, Sociology and Anthropology, Social Work.

#### M.A. Legal Studies with Collaborative Specialization in Accessibility (5.0 credits)

##### Requirements - Thesis pathway (5.0 credits)

1. 1.0 credit in:	1.0
ACCS 5001 [0.5] Critical Disability Studies	
ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar	
2. 1.0 credit in:	1.0
LAWS 5000 [0.5] Theories of Law and Social Transformation	
LAWS 5001 [0.5] Legal Method and Social Inquiry	
3. 1.0 credit in LAWS	1.0
4. 2.0 credits in:	2.0
LAWS 5909 [2.0] M.A. Thesis (in the specialization. Includes an oral examination)	
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Research essay pathway (5.0 credits)

1. 1.0 credit in:	1.0
ACCS 5001 [0.5] Critical Disability Studies	
ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar	
2. 1.0 credit in:	1.0
LAWS 5000 [0.5] Theories of Law and Social Transformation	
LAWS 5001 [0.5] Legal Method and Social Inquiry	
3. 2.0 credits in LAWS	2.0
4. 1.0 credit in:	1.0
LAWS 5908 [1.0] M.A. Research Essay (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Coursework pathway (5.0 credits)

1. 1.0 credit in:	1.0
ACCS 5001 [0.5] Critical Disability Studies	
ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar	
2. 1.0 credit in:	1.0
LAWS 5000 [0.5] Theories of Law and Social Transformation	
LAWS 5001 [0.5] Legal Method and Social Inquiry	
3. 2.5 credits in LAWS	2.5
4. 0.5 credit in a course designated as having sufficient accessibility content and approved by the Legal Studies Graduate Supervisor	0.5
<b>Total Credits</b>	<b>5.0</b>

#### M.A. Legal Studies with Collaborative Specialization in African Studies (5.0 credits)

##### Requirements - Thesis pathway

1. 0.5 credit in:	0.5
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	
2. 1.0 credit in:	1.0
LAWS 5000 [0.5] Theories of Law and Social Transformation	
LAWS 5001 [0.5] Legal Method and Social Inquiry	

<b>3. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>4. 1.5 credits in LAWS</b>		1.5
<b>5. 2.0 credits in:</b>		2.0
LAWS 5909 [2.0]	M.A. Thesis (in the specialization, including an oral examination. See Note, below)	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		1.0
LAWS 5000 [0.5]	Theories of Law and Social Transformation	
LAWS 5001 [0.5]	Legal Method and Social Inquiry	
<b>4. 2.5 credits in LAWS</b>		2.5
<b>5. 1.0 credit in:</b>		1.0
LAWS 5908 [1.0]	M.A. Research Essay (in the specialization. See Note, below)	
<b>Total Credits</b>		<b>5.0</b>

Note: Thesis/Research Essay: The thesis or research essay must represent the result of the candidate's independent research undertaken after being admitted into graduate studies in the Department of Law and Legal Studies. Previous work of the candidate may be used only as introductory or background material for the thesis or research essay. A student may carry on research work related to the thesis or research essay off campus if the work is approved in advance and supervision arrangements have been made with the supervisor of graduate studies.

### **M.A. Legal Studies with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)**

<b>Requirements - Thesis pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 1.0 credit in:</b>		1.0
LAWS 5000 [0.5]	Theories of Law and Social Transformation	
LAWS 5001 [0.5]	Legal Method and Social Inquiry	
<b>3. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>4. 1.5 credits in LAWS</b>		1.5
<b>5. 2.0 credits in:</b>		2.0
LAWS 5909 [2.0]	M.A. Thesis (in the specialization. Includes an oral examination)	
<b>Total Credits</b>		<b>5.0</b>

### **Requirements - Research essay pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
LAWS 5000 [0.5]	Theories of Law and Social Transformation	
LAWS 5001 [0.5]	Legal Method and Social Inquiry	
<b>4. 2.5 credits in LAWS</b>		2.5
<b>5. 1.0 credit in:</b>		1.0
LAWS 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### **Requirements - Coursework pathway (5.0 credits)**

<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
LAWS 5000 [0.5]	Theories of Law and Social Transformation	
LAWS 5001 [0.5]	Legal Method and Social Inquiry	
<b>4. 2.5 credits in LAWS</b>		2.5
<b>5. 1.0 credit in</b> course(s) designated as having sufficient Latin American and/or Caribbean Studies content, approved by both LAWS Graduate Supervisor and the Coordinator of Latin American and Caribbean Studies		1.0
<b>Total Credits</b>		<b>5.0</b>

### **Ph.D. Legal Studies (4.5 credits)**

<b>Requirements:</b>		
<b>1. 0.5 credit in:</b>		0.5
LAWS 6000 [0.5]	Doctoral Seminar in Legal Studies	
<b>2. 0.5 credit in:</b>		0.5
LAWS 6001 [0.5]	Proseminar in Legal Studies	
<b>3. 2.0 credits in:</b>		2.0
LAWS 6095 [1.0]	Field Comprehensive	
LAWS 6096 [1.0]	Thesis Proposal	
<b>4. 1.5 credits in</b> approved courses, at least 0.5 of which must be chosen from		1.5
LAWS 6002 [0.5]	Law, Regulation and Governance	
LAWS 6003 [0.5]	Human Rights, Citizenship and Global Justice	
LAWS 6004 [0.5]	Crime, Law, and Security	
Students will normally be required to take the course which relates to their field of study. Optional courses will be selected from a list approved annually by the department. Students may complete up to 1.0 credit of approved courses offered in other departments. Students may also choose directed reading courses with the core faculty of the program		
<b>5. 0.0 credits in:</b>		

LAWS 6909 [0.0] Ph. D. Thesis (must be successfully defended at an oral examination.)

**Total Credits** **4.5**

## Ph.D. Legal Studies with Collaborative Specialization in Political Economy (4.5 credits)

### Requirements:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
LAWS 6000 [0.5] Doctoral Seminar in Legal Studies	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
LAWS 6001 [0.5] Proseminar in Legal Studies	
<b>4. 2.0 credits in:</b>	<b>2.0</b>
LAWS 6095 [1.0] Field Comprehensive	
LAWS 6096 [1.0] Thesis Proposal	
<b>5. 0.5 credit from:</b>	<b>0.5</b>
LAWS 6002 [0.5] Law, Regulation and Governance	
LAWS 6003 [0.5] Human Rights, Citizenship and Global Justice	
LAWS 6004 [0.5] Crime, Law, and Security	
<b>6. 0.5 credit in:</b>	<b>0.5</b>
PECO 6000 [0.5] Political Economy: Core Concepts	
<b>7. 0.5 credit in:</b>	<b>0.5</b>
A relevant political economy course from the approved list	
<b>8. 0.0 credits in:</b>	<b>0.0</b>
LAWS 6909 [0.0] Ph. D. Thesis (In the specialization. Must be successfully defended at an oral examination.)	

**Total Credits** **4.5**

## Comprehensive Examination and Thesis Proposal

As indicated above, each doctoral candidate must successfully write and pass a field comprehensive examination ( LAWS 6095 [1.0]). The examination will focus on the relevant theoretical and methodological issues related to the candidate's field of study:

1. Crime, Law and Security
2. Human Rights, Citizenship and Global Justice
3. Law, Regulation and Governance

The examination can take a variety of forms including, for example, a major paper, a take-home examination, or a course design, each of which may be required to be defended at an oral examination. The exact format of the comprehensive examination is at the discretion of the student's supervisory committee in consultation with the student. This committee will also form the examining board of the comprehensive examination. Evaluation is on the basis of Satisfactory/Unsatisfactory. LAWS 6095 [1.0] will normally be completed no later than the end of the fall of the second year of registration in the program. Failure to complete the examination successfully will result in denial of permission to continue in the program.

Also as indicated above, each doctoral candidate must successfully complete and defend a thesis proposal ( LAWS 6096 [1.0]). The proposal must be written after the completion of the other course requirements, and

normally should be completed by the end of the second year of doctoral study. The proposal is defended at an oral examination conducted by the supervisory committee. Evaluation is on the basis: Pass/Fail. The proposal must be successfully defended before the candidate can register in the Ph.D. Thesis LAWS 6909.

## Period of Study

This program is designed to be completed in four years of full-time study. Students admitted to part-time study will normally complete all requirements within eight years of registration.

## Selection of Courses in Related Disciplines

In addition to the graduate courses offered by the Department of Law and Legal Studies, students in the Ph.D. program are permitted to take up to 1.0 credit of courses in a related discipline, in consultation with the Graduate Supervisor.

Students should be aware that the number of spaces in graduate courses offered by other departments may be limited, and that registration may be conditional upon obtaining the prior approval of the department concerned. It is the student's responsibility to ensure that permission is obtained from the appropriate department prior to registering in any of the department's courses.

For an up-to-date listing of offerings and course descriptions in other departments, please consult the graduate calendar and the class schedule at <https://central.carleton.ca>.

## Regulations

See the General Regulations section of this Calendar.

## Guidelines for Completion of Master's Degree

Full-time students are expected to complete the required two courses LAWS 5000 and LAWS 5001 and either an additional 2.0 credits (for those following the thesis program), or an additional 3.0 credits (for those following the research essay program) by the end of the second term of registration. The thesis or research essay should normally be submitted by the end of the fourth term of study.

Part-time students are expected to complete the required two courses LAWS 5000 and LAWS 5001 and either an additional 2.0 credits (for those following the thesis program) or an additional 3.0 credits (for those following the research essay program) by the end of their third year of study. The thesis or research essay should normally be submitted by the end of the fifth year of study.

## Regulations

See the General Regulations section of this Calendar.

Doctoral students must normally obtain a grade of B- or better in each course counted toward the fulfillment of the requirements of the degree.

## Admission - M.A.

The requirement for admission into the M.A. program in Legal Studies is an Honours bachelor's degree or the equivalent, with at least high honours standing.

Applicants will be considered for admission on the basis of their academic background and standing. Where relevant, previous professional experience may be taken into account.

The Supervisor of Graduate Studies may, in some circumstances, recommend that applicants with exceptional promise who have less than BA (Honours) status be admitted into a qualifying-year program designed to raise their standing to honours status.

Applicants without a background in law may be required to complete one or more designated courses from the department's undergraduate program before taking courses towards the master's degree.

### **Admission - Ph.D.**

Applicants will normally hold a master's degree (or equivalent) with at least an A- average. Given the interdisciplinary nature of the department and the graduate program, applications are accepted from a wide variety of backgrounds, including, but not limited to, legal studies, political science, history, criminology, sociology, women's studies and philosophy. In cases of uncertainty, potential applicants are encouraged to contact the Graduate Supervisor as to the suitability of their background. Depending on their academic background, applicants may be asked to complete course work in addition to the Ph.D. program requirements.

### **Law (LAWS) Courses**

Note: some graduate courses may also be open to interested fourth-year students with permission of the Department.

#### **LAWS 5000 [0.5 credit]**

##### **Theories of Law and Social Transformation**

Examines three groups of theories of law (liberal, sociological and Marxist) focusing on different ways law is conceived as an object of inquiry and on different accounts of trajectories of legal development. Potential of law for realizing or inhibiting social change provides analytic framework.

#### **LAWS 5001 [0.5 credit]**

##### **Legal Method and Social Inquiry**

Introduces problems of research strategy and methods. Explores contrasting methodologies in legal research; evaluates methodologies employed in understanding legal reasoning, discourses, and practices. Includes seminars in which participants present outlines of their own research projects, focusing on methodologies and research questions.

#### **LAWS 5002 [0.5 credit]**

##### **Law and Gender Relations**

Examines theoretical approaches informed by significance of gender to structure and operation of law. Concepts such as essentialism, difference, cultural determination, and social construction of gender relations examined in context of contemporary feminist debates. Focus on understanding and facility with feminist analysis and methodology.

#### **LAWS 5003 [0.5 credit]**

##### **Law, Economy and Society**

Addresses the relationship between law, economy, and society. Competing theoretical accounts of the relationship between legal regulation and social and economic change explored through selected historical and contemporary case studies.

#### **LAWS 5004 [0.5 credit]**

##### **Law, Crime and Social Order**

Examines issues of crime control and state security through topical, in-depth investigations into contemporary problems. Focus is on critically analyzing the criminal justice system, and crime control strategies, as order maintenance /social control.

#### **LAWS 5005 [0.5 credit]**

##### **Law, State and Politics**

Examines theoretical explanations of relationships between law, state and politics. Selected areas such as rights theory, rule of law, separation of powers or judicial review may provide focus.

#### **LAWS 5006 [0.5 credit]**

##### **Historical Perspectives on Law and Society**

Examines historical relationship between social forces, law and legal institutions and utility of historical forms of knowledge and methods to legal studies. Surveys selected issues in private, public and criminal law.

#### **LAWS 5007 [0.5 credit]**

##### **Race, Ethnicity and the Law**

Examines ways race and racism interact with gender and class in shaping legal system. Explores ways legal system institutionalizes racism and potential for using the legal system to combat racism. Selected areas such as immigration law and native rights may be used to illustrate themes.

**LAWS 5008 [0.5 credit]****Consuming Passions: The Regulation of Consumption, Appearance and Sexuality**

Examines rise of consumption and private pleasures and their regulation and self-regulation. Social history of regulation of two fields of consumption: surfaces of the person: personal appearance, in particular of dress, the body, sexuality; and intakes of the body, focusing on food, alcohol, drugs.

**LAWS 5100 [0.5 credit]****Legal Theory and Contemporary Issues**

Studies in legal theory and analyses of law advanced by Hart, Dworkin, and others, and legal concepts: for example, principles, rights, duties, liability, etc. Precise course content will vary from year to year and will be announced at the beginning of the term.

Prerequisite(s): LAWS 3101 and PHIL 3102.

**LAWS 5200 [0.5 credit]****International Economic Law: Regulation of Trade and Investment**

Study of regulation of international economic activity. Discussion of relevant international institutions, legal aspects of integration, governmental regulation of trade and investment.

Also listed as INAF 5507.

Prerequisite(s): Open only to students in their master's year who have not studied international economic law.

**LAWS 5302 [0.5 credit]****Feminism, Law and Social Transformation**

Drawing on contemporary cases and/or historical contexts to explore limits and impact of feminist legal engagement. Race, class, disability, sexuality and other social categories and changing feminist conceptions of law and sites of legal relations, politics and activism: the meaning of social transformation.

**LAWS 5305 [0.5 credit]****Crime, Social Change and Criminal Law Reform**

Political, practical and ideological dimensions of criminal law reform and activism undertaken by individuals, groups and the state to achieve social transformation. Reform initiatives are considered in relation to their effects on race, class, gender, sexuality, disability and other sites of difference and discrimination.

**LAWS 5306 [0.5 credit]****Police and Capital**

The idea of 'police' as a general historical project aimed at the fabrication of social order and the development of liberal philosophy, political economy and security. Contemporary public and private security provision considered in light of commodification, class conflict, and risk thinking.

Also listed as SOCI 5305.

**LAWS 5500 [0.5 credit]****The Canadian Constitution**

Familiarizes students with terminology, principles, and doctrines of judicial interpretation of Constitution Acts 1867-1982 and other constitutional statutes. Emphasis on division of legislative powers in the Canadian federation.

Prerequisite(s): open only to graduate students in their master's year who have not previously studied Canadian constitutional law.

**LAWS 5603 [0.5 credit]****International Law: Theory and Practice**

Legal principles governing international relations; emphasis on different theoretical, historical and political perspectives, such as Natural Law, Positivism, Critical Legal Studies, TWAIL, Feminism, Marxism. Specific case studies or topics are examined to critically interrogate the foundations and practices of international law.

Also listed as INAF 5505.

**LAWS 5662 [0.5 credit]****Law, Regulation and Governance**

Historical and contemporary roles of law and regulation in processes, practices and discourses of governance. Law and state; domestic and global governance; diversity of law-governance relationships; law as a constituent force, enforcement mechanism and a distinctive product of governance.

Also offered, with different requirements as appropriate, as LAWS 6002, for which additional credit is precluded.

**LAWS 5663 [0.5 credit]****Human Rights, Citizenship and Global Justice**

The implications of law in selected issues involving human rights, citizenship and global justice. Topics may include justification and legitimation of human rights, contemporary citizenship, struggles for global justice, recognition and democracy, and post-nationalism and global economic regulation.

Also offered with different requirements where appropriate, as LAWS 6003, for which additional credit is precluded.

**LAWS 5664 [0.5 credit]**  
**Crime, Law and Security**

Contemporary debates around crime, criminal justice and security as mediated through law. The interrelationship between the politics, process and reform of criminal justice in a socio-legal context.

Also offered as LAWS 6004, with different requirements where appropriate, for which additional credit is precluded.

**LAWS 5900 [0.5 credit]**  
**Tutorials/Directed Readings in Law**

Tutorials or reading courses on selected topics may be arranged with the permission of the supervisor of graduate studies and the approval of the supervising faculty member.

**LAWS 5901 [0.5 credit]**  
**Tutorial/Directed Readings in Law**

Tutorials or reading courses on selected topics may be arranged with the permission of the supervisor of graduate studies and the approval of the supervising faculty member.

**LAWS 5903 [0.5 credit]**  
**Contemporary Topics in Legal Studies**

A research seminar which explores a selected topic from current debates in legal studies. Students should check with the Department regarding the topic offered.

**LAWS 5904 [0.5 credit]**  
**Contemporary Topics in Legal Studies**

A research seminar which explores a selected topic from current debates in legal studies. Students should check with the Department regarding the topic offered.

**LAWS 5908 [1.0 credit]**  
**M.A. Research Essay**  
Includes: Experiential Learning Activity

**LAWS 5909 [2.0 credits]**  
**M.A. Thesis**  
Includes: Experiential Learning Activity

**LAWS 6000 [0.5 credit]**  
**Doctoral Seminar in Legal Studies**  
Analysis of the major themes, approaches and literature in contemporary legal and social theory.

**LAWS 6001 [0.5 credit]**  
**Proseminar in Legal Studies**

A seminar which meets every two weeks throughout the academic year. Based on presentations of papers and works in progress by faculty, students and invited guests, as well as assigned readings on issues that deal with current research in legal studies.

**LAWS 6002 [0.5 credit]**  
**Law, Regulation and Governance**

Historical and contemporary roles of law and regulation in processes, practices and discourses of governance. Law and state; domestic and global governance; diversity of law-governance relationships; law as a constituent force, enforcement mechanism and a distinctive product of governance.

Also offered as LAWS 5662, with different requirements where appropriate, for which additional credit is precluded.

**LAWS 6003 [0.5 credit]**  
**Human Rights, Citizenship and Global Justice**

The implications of law in selected issues involving human rights, citizenship and global justice. Topics may include justification and legitimization of human rights, contemporary citizenship, struggles for global justice, recognition and democracy, and post-nationalism and global economic regulation.

Also offered as LAWS 5663, with different requirements where appropriate, for which additional credit is precluded.

**LAWS 6004 [0.5 credit]**  
**Crime, Law, and Security**

Contemporary debates around crime, criminal justice and security as mediated through law. The interrelationship between the politics, process and reform of criminal justice in a socio-legal context.

Also offered as LAWS 5664, with different requirements where appropriate, for which additional credit is precluded.

**LAWS 6010 [0.5 credit]**  
**Directed Readings in Legal Studies**

Advanced directed readings in selected areas of legal studies, involving presentation of papers as the basis for discussion with the course instructor.

**LAWS 6095 [1.0 credit]****Field Comprehensive**

The field comprehensive examination will focus on the relevant theoretical and/or methodological issues related to the field of study. The examination can take a variety of forms and will be decided by the supervisory committee in consultation with the student.

The form of the exam will be in accordance with departmental policy.

**LAWS 6096 [1.0 credit]****Thesis Proposal**

The thesis proposal is written after completion of the other course requirements, and is normally completed by the end of the second year of doctoral study. The proposal is defended at an oral examination conducted by the supervisory committee. Graded Sat/Uns.

**LAWS 6909 [0.0 credit]****Ph. D. Thesis**

Includes: Experiential Learning Activity

## Linguistics

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This section presents the requirements for programs in:

- **M.A. Linguistics**
- **Ph.D. Linguistics**
- **Graduate Diploma in Linguistics**

**Program Requirements****M.A. Linguistics (5.0 credits)**

Students will establish their programs in consultation with the School's supervisor of graduate studies. Each candidate will select one of the following program paths:

**Requirements - Thesis Pathway (5.0 credits)**

<b>1. 0.5 credit from:</b>	<b>0.5</b>
LING 5007 [0.5]	Phonology
LING 5077 [0.5]	Phonetics
<b>2. 0.5 credit from:</b>	<b>0.5</b>
LING 5004 [0.5]	Syntax
LING 5005 [0.5]	Morphology
LING 5505 [0.5]	Semantics
<b>3. 1.5 credit at the 5000 level in LING, or a related field, chosen in consultation with the School. Coursework must fulfil the graduate-level course requirements as described in the Graduate Regulations.</b>	<b>1.5</b>
<b>4. 2.5 credits in:</b>	<b>2.5</b>
LING 5909 [2.5]	M.A. Thesis
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Research Essay Pathway (5.0 credits)**

<b>1. 0.5 credit from:</b>	<b>0.5</b>
LING 5007 [0.5]	Phonology
LING 5077 [0.5]	Phonetics
<b>2. 0.5 credit from:</b>	<b>0.5</b>
LING 5004 [0.5]	Syntax
LING 5005 [0.5]	Morphology
LING 5505 [0.5]	Semantics
<b>3. 3.0 credits at the 5000 level in LING, or a related field, chosen in consultation with the School. Coursework must fulfil the graduate-level course requirements as described in the Graduate Regulations.</b>	<b>3.0</b>
<b>4. 1.0 credit in:</b>	<b>1.0</b>
LING 5908 [1.0]	Research Essay
<b>Total Credits</b>	<b>5.0</b>

**Ph.D. Linguistics (3.0 credits)****Requirements:**

<b>1. Candidates admitted to first year of the PhD program must complete the following course before proceeding to the second year of study:</b>	<b>0.5</b>
LING 5001 [0.5]	Foundations of Linguistics
<b>2. 0.0 credit in:</b>	
LING 6001 [0.0]	Scholarly Preparation in Linguistics 1
LING 6002 [0.0]	Scholarly Preparation in Linguistics 2
<b>3. 0.5 credit from:</b>	<b>0.5</b>
LING 5007 [0.5]	Phonology
LING 5077 [0.5]	Phonetics

<b>4. 0.5 credit from:</b>	0.5
LING 5004 [0.5]	Syntax
LING 5005 [0.5]	Morphology
LING 5505 [0.5]	Semantics
<b>5. 0.5 credit from:</b>	0.5
LING 5600 [0.5]	Methods in Data Collection
LING 5800 [0.5]	Language Documentation
ALDS 6407 [0.5]	Revitalization Policy
<b>6. 1.0 credit at 5000 or 6000 level chosen in consultation with the graduate supervisor.</b>	1.0
<b>7. 0.0 credit in:</b>	
LING 6907 [0.0]	Doctoral Comprehensive Examination
LING 6908 [0.0]	Qualifying Paper
<b>8. 0.0 credit in:</b>	
LING 6909 [0.0]	Ph.D. Thesis
<b>Total Credits</b>	<b>3.0</b>

### Ph.D. Linguistics (Advanced entry - 2.5 credits)

#### Requirements:

<b>1. 0.0 credit in:</b>	
LING 6001 [0.0]	Scholarly Preparation in Linguistics 1
LING 6002 [0.0]	Scholarly Preparation in Linguistics 2
<b>2. 0.5 credit from:</b>	0.5
LING 5007 [0.5]	Phonology
LING 5077 [0.5]	Phonetics
<b>3. 0.5 credit from:</b>	0.5
LING 5004 [0.5]	Syntax
LING 5005 [0.5]	Morphology
LING 5505 [0.5]	Semantics
<b>4. 0.5 credit from:</b>	0.5
LING 5600 [0.5]	Methods in Data Collection
LING 5800 [0.5]	Language Documentation
ALDS 6407 [0.5]	Revitalization Policy
<b>5. 1.0 credit at 5000 or 6000 level chosen in consultation with the graduate supervisor.</b>	1.0
<b>6. 0.0 credit in:</b>	
LING 6907 [0.0]	Doctoral Comprehensive Examination
LING 6908 [0.0]	Qualifying Paper
<b>7. 0.0 credit in:</b>	
LING 6909 [0.0]	Ph.D. Thesis
<b>Total Credits</b>	<b>2.5</b>

### Graduate Diploma in Linguistics (2.0 credits)

#### Requirements:

<b>1. 0.5 credit from:</b>	0.5
LING 5007 [0.5]	Phonology
LING 5077 [0.5]	Phonetics
<b>2. 0.5 credit from:</b>	0.5
LING 5004 [0.5]	Syntax
LING 5005 [0.5]	Morphology
LING 5505 [0.5]	Semantics

**3. 1.0 credit in LING** at the 5000- or 6000-level, or in courses in a related field, as approved by the Graduate Supervisor. 1.0

**Total Credits** 2.0

### Admission

The normal requirement for admission to the master's program is a BA Honours degree in linguistics or a related field (e.g. applied linguistics, cognitive science, psychology, anthropology).

Students must have achieved a minimum of B+ in a relevant field and B overall in their academic work in the last two years of study.

### Accelerated Pathway

The accelerated pathway in the School of Linguistics and Language Studies is a flexible and individualized plan of graduate study for students in their final year of a Carleton B.A. Honours Linguistics degree. Students in their third year of study in the B.A. Honours degree in Linguistics should consult with both the undergraduate advisor and the graduate supervisor to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies. Students may receive advanced standing with transfer of credit up to 1.0 credit, which can reduce their time to completion in the MA program. The Accelerated Pathway requirements are two LING courses at the 5000 level and a minimum overall CGPA of B+.

### Admission

The normal requirement for admission to the PhD in Linguistics is a master's degree in Linguistics with an overall GPA of at least A-.

### Admission

In order to apply for admission into the Graduate Diploma in Linguistics, students must first be enrolled in a graduate program at Carleton. Application for those programs is independent of application for the Diploma. The normal requirement for admission to the Diploma is undergraduate or graduate coursework in linguistics or closely related fields. Preference will be given for students enrolled in one of these programs: Applied Linguistics and Discourse Studies, Anthropology, Cognitive Science, English, or French.

### Regulations

See the General Regulations section of this Calendar, and in addition the following:

- Candidates must maintain a grade point average of 10.0 or better throughout this program.

### M.A. Regulations

#### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the M.A. Linguistics including all specializations/concentrations is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## **Ph.D. Regulations**

### **Residence Requirement**

Ph.D. candidates must normally be registered full-time in a minimum of six terms to satisfy the residence requirement. If a candidate is registered part-time, the minimum residence requirement is eight terms.

### **Guidelines for Completion of Ph.D.**

Full-time Ph.D. students are normally expected to complete their requirements in four calendar years. All part-time students must complete their requirements within a period of nine years, as set out in the General Regulations in the Graduate Calendar.

## **Linguistics (LING) Courses**

### **LING 5001 [0.5 credit]**

#### **Foundations of Linguistics**

Presupposing no prior knowledge of linguistics, this course introduces the key concepts and issues of the discipline at an advanced level. Content may include phonetics, phonology, morphology, syntax, and semantics. The course prepares students new to linguistics in Canada for other graduate-level coursework.

### **LING 5004 [0.5 credit]**

#### **Syntax**

A graduate seminar in contemporary syntactic theory. Repeatable for credit when the topic changes. Departmental permission may be required to repeat for credit.

Includes: Experiential Learning Activity

### **LING 5005 [0.5 credit]**

#### **Morphology**

A graduate seminar in contemporary morphological theory. Repeatable for credit when the topic changes. Departmental permission may be required to repeat for credit.

Includes: Experiential Learning Activity

### **LING 5007 [0.5 credit]**

#### **Phonology**

A graduate seminar in contemporary phonological theory. Repeatable for credit when the topic changes. Departmental permission may be required to repeat for credit.

Includes: Experiential Learning Activity

### **LING 5009 [0.5 credit]**

#### **Special Topic in Linguistics**

Examination of a topic or more specialized area in linguistics or language study. Topic to be announced. Repeatable for credit when the topic changes.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as LING 4009, for which additional credit is precluded.

### **LING 5077 [0.5 credit]**

#### **Phonetics**

A graduate seminar in contemporary phonetics.

Repeatable for credit when the topic changes.

Departmental permission may be required to repeat for credit.

Includes: Experiential Learning Activity

### **LING 5412 [0.5 credit]**

#### **Diversité du français**

Études des variétés du français, dans ses dimensions spatiales. Le contenu précis de ce cours varie selon les années. Consulter le site Web du Département de français pour obtenir les détails.

Also listed as FREN 5412.

Also offered at the undergraduate level, with different requirements, as LING 4412 and FREN 4412, for which additional credit is precluded.

### **LING 5413 [0.5 credit]**

#### **Diachronie du français**

Étude du français, dans ses dimensions historiques.

Le contenu précis de ce cours varie selon les années.

Consulter le site Web du Département de français pour obtenir les détails.

Also listed as FREN 5413.

Also offered at the undergraduate level, with different requirements, as LING 4413 and FREN 4413, for which additional credit is precluded.

### **LING 5414 [0.5 credit]**

#### **Analyse du français**

Étude du français, dans ses dimensions morphologiques, syntaxiques ou phonologiques. Le contenu précis de ce cours varie selon les années. Consulter le site Web du Département de français pour obtenir les détails.

Also listed as FREN 5414.

Also offered at the undergraduate level, with different requirements, as LING 4414 and FREN 4414, for which additional credit is precluded.

**LING 5415 [0.5 credit]****Variation du français**

Étude des variations internes de la langue, dans ses dimensions orales et écrites. Le contenu précis de ce cours varie selon les années. Consulter le site Web du Département de français pour obtenir les détails.

Also listed as FREN 5415.

Also offered at the undergraduate level, with different requirements, as FREN 4415 and LING 4415., for which additional credit is precluded.

**LING 5505 [0.5 credit]****Semantics**

A graduate seminar in contemporary semantics.

Includes: Experiential Learning Activity

Also listed as PHIL 5650.

**LING 5510 [0.5 credit]****Lexical Semantics**

Study of the meaning of words. Topics may include lexical decomposition, meaning variation, lexical relations, and lexical aspect.

Includes: Experiential Learning Activity

Also listed as PHIL 5660.

Also offered at the undergraduate level, with different requirements, as LING 4510 and PHIL 4055, for which additional credit is precluded.

**LING 5600 [0.5 credit]****Methods in Data Collection**

Core seminar in methods of data collection for linguistic research.

Includes: Experiential Learning Activity

Precludes additional credit for LING 6803 (no longer offered).

**LING 5601 [0.5 credit]****Cognitive Neuroscience of Language**

Further study of psychological and neurolinguistic mechanisms of adult language processing. May include topics from first language acquisition.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as LING 4601, for which additional credit is precluded.

**LING 5603 [0.5 credit]****First Language Acquisition**

Advanced topics in language acquisition and development, and the relative contributions of the environment, cognitive development, and inborn knowledge.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as LING 4603, for which additional credit is precluded.

**LING 5605 [0.5 credit]****Psycholinguistic Research Methods**

Introduction to experimental methodologies used in current psycholinguistic studies. Topics include experimental design and techniques, descriptive statistics, and interpreting and reporting research findings.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as LING 4605, for which additional credit is precluded.

**LING 5606 [0.5 credit]****Statistics for Language Research**

Application of statistical procedures to analysis of language data and to problems of measurement in experimental linguistics, applied linguistics, psycholinguistics, and related fields.

Includes: Experiential Learning Activity

Also listed as ALDS 5604.

Also offered at the undergraduate level, with different requirements, as ALDS 4606 and LING 4606, for which additional credit is precluded.

**LING 5608 [0.5 credit]****Language and Cognition**

An introduction to the contribution of theoretical linguistics and linguistic research to cognitive science.

Includes: Experiential Learning Activity

Also listed as ALDS 5301 and CGSC 5003.

**LING 5704 [0.5 credit]****Linguistic Analysis, Culture and Cognition**

Universals of language from a cross-cultural perspective. Study of lesser-known languages leading to critical understanding of universal human concepts and communication practices in culture-specific configurations. Cross-linguistic analysis as a means to general understanding of diversity and universality in human cognition.

Includes: Experiential Learning Activity

Also listed as ALDS 5303.

**LING 5800 [0.5 credit]****Language Documentation**

Core seminar in language documentation. Exploration of fundamental issues in language documentation including language description vs. documentation, endangered languages, community relations, ethics and documentation methods.

Includes: Experiential Learning Activity

Precludes additional credit for LING 6802 (no longer offered).

**LING 5801 [0.5 credit]****Linguistic Field Methods**

With a language consultant, students discover the phonological, morphological, and syntactic structures of the target language using linguistic elicitation. Language will vary from year to year but will normally be a non-European language. Language documentation, data management, ethical issues surrounding research in Indigenous communities.

Includes: Experiential Learning Activity

Also listed as ALDS 5801.

Also offered at the undergraduate level, with different requirements, as LING 4801, for which additional credit is precluded.

**LING 5802 [0.5 credit]****Historical Linguistics: English**

A theory-intensive course that will study the development of English starting with Proto-Indo-European progressing through Common Germanic to the stages of English itself. Topics include phonological sound changes, phonemic inventories, and morphological and syntactic theory. Also listed as ENGL 5101.

Also offered at the undergraduate level, with different requirements, as LING 4802, for which additional credit is precluded.

**LING 5901 [0.5 credit]****Directed Reading in Linguistics**

Research on a topic chosen in consultation with a faculty member and with the approval of the graduate supervisor. Prerequisite(s): Approval of the graduate supervisor.

**LING 5908 [1.0 credit]****Research Essay**

Includes: Experiential Learning Activity

**LING 5909 [2.5 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

**LING 6001 [0.0 credit]****Scholarly Preparation in Linguistics 1**

This course will provide scholarly preparation in linguistics through active participation in public colloquia, weekly meetings of the Linguistics Reading Group, and professional development activities in Reading Group. Graded SAT/UNS.

Includes: Experiential Learning Activity

**LING 6002 [0.0 credit]****Scholarly Preparation in Linguistics 2**

This course will provide scholarly preparation in linguistics through active participation in public colloquia, weekly meetings of the Linguistics Reading Group, and professional development activities and presentations in Reading Group. Graded SAT/UNS.

Includes: Experiential Learning Activity

Prerequisite(s): LING 6001 or approval of the graduate supervisor.

**LING 6901 [0.5 credit]****Directed Reading in Linguistics**

Research on a topic chosen in consultation with a faculty member and with the approval of the graduate supervisor.

Includes: Experiential Learning Activity

**LING 6907 [0.0 credit]****Doctoral Comprehensive Examination**

Students must pass an oral comprehensive exam that will evaluate their knowledge of linguistic theory. Students will be provided with a reading list of literature in theoretical linguistics that they should be familiar with, based on their core linguistics courses and their research interests.

Includes: Experiential Learning Activity

**LING 6908 [0.0 credit]****Qualifying Paper**

Students are required to write a Qualifying Paper (QP) that assesses their potential for conducting original research. Their QP must include aspects of both linguistic theory and language documentation and/or revitalization, although the proportion devoted to each component will vary from student to student.

Includes: Experiential Learning Activity

**LING 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

# Management

This section presents the requirements for programs in:

- **M.Sc. Management**
- **M.Sc. Management with Collaborative Specialization in Climate Change**
- **Ph.D. Management**

## Program Requirements

### M.Sc. Management (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

<b>1. 1.5 credits in:</b>	<b>1.5</b>
BUSI 5980 [0.5]	Foundations of Management Theory and Research
BUSI 5981 [0.5]	Statistics for Business Research
BUSI 5982 [0.5]	Research Methodology in Business
<b>2. 0.5 credit from:</b>	<b>0.5</b>
BUSI 5983 [0.5]	Qualitative Research Design
BUSI 5984 [0.5]	Quantitative Research Design
<b>3. 1.0 credit from:</b>	<b>1.0</b>
BUSI 5080 [0.5]	Seminar in Accounting I
BUSI 5081 [0.5]	Seminar in Accounting II
BUSI 5180 [0.5]	Seminar in Management I: Modern Organization Theory
BUSI 5181 [0.5]	Seminar in Management II: Current Topics in Organizational Behaviour
BUSI 5280 [0.5]	Seminar in Marketing I: Management and Strategy
BUSI 5281 [0.5]	Seminar in Marketing II: Consumer Behaviour
BUSI 5380 [0.5]	Seminar in Management of Production/Operations I: Strategic Management of Production Systems
BUSI 5381 [0.5]	Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface
BUSI 5383 [0.5]	Systems Optimization: Methods and Models
BUSI 5480 [0.5]	Seminar in Information Systems I: Research Issues
BUSI 5481 [0.5]	Seminar in Information Systems II: Current Trends
BUSI 5580 [0.5]	Seminar in Finance I: Topical Issues in Investments
BUSI 5581 [0.5]	Seminar in Finance II: Theories and Empirical Methods in Corporate Finance
BUSI 5780 [0.5]	Seminar in International Business I: International Markets and Strategy
BUSI 5781 [0.5]	Seminar in International Business II: Managing in a Global Environment

or elective courses taken with the permission of the Director of the Graduate Research Program

<b>4. 0.0 credit in:</b>	
BUSI 5987 [0.0]	M.Sc. Thesis Tutorial
<b>5. 2.0 credits in:</b>	<b>2.0</b>

BUSI 5989 [2.0]	M.Sc. Thesis
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits):

<b>1. 1.5 credits in:</b>	<b>1.5</b>
BUSI 5980 [0.5]	Foundations of Management Theory and Research
BUSI 5981 [0.5]	Statistics for Business Research
BUSI 5982 [0.5]	Research Methodology in Business
<b>2. 0.5 credit from:</b>	<b>0.5</b>
BUSI 5983 [0.5]	Qualitative Research Design
BUSI 5984 [0.5]	Quantitative Research Design
<b>3. 2.0 credits from:</b>	<b>2.0</b>
BUSI 5080 [0.5]	Seminar in Accounting I
BUSI 5081 [0.5]	Seminar in Accounting II
BUSI 5180 [0.5]	Seminar in Management I: Modern Organization Theory
BUSI 5181 [0.5]	Seminar in Management II: Current Topics in Organizational Behaviour
BUSI 5280 [0.5]	Seminar in Marketing I: Management and Strategy
BUSI 5281 [0.5]	Seminar in Marketing II: Consumer Behaviour
BUSI 5380 [0.5]	Seminar in Management of Production/Operations I: Strategic Management of Production Systems
BUSI 5381 [0.5]	Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface
BUSI 5383 [0.5]	Systems Optimization: Methods and Models
BUSI 5480 [0.5]	Seminar in Information Systems I: Research Issues
BUSI 5481 [0.5]	Seminar in Information Systems II: Current Trends
BUSI 5580 [0.5]	Seminar in Finance I: Topical Issues in Investments
BUSI 5581 [0.5]	Seminar in Finance II: Theories and Empirical Methods in Corporate Finance
BUSI 5780 [0.5]	Seminar in International Business I: International Markets and Strategy
BUSI 5781 [0.5]	Seminar in International Business II: Managing in a Global Environment

or elective courses taken with the permission of the Director of the Graduate Research Program

<b>4. 1.0 credit in:</b>	<b>1.0</b>
BUSI 5988 [1.0]	M.Sc. Research Essay
<b>Total Credits</b>	<b>5.0</b>

### M.Sc. Management with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]	Climate Seminar Series

<b>3. 1.5 credits in:</b>	<b>1.5</b>
BUSI 5980 [0.5]	Foundations of Management Theory and Research
BUSI 5981 [0.5]	Statistics for Business Research
BUSI 5982 [0.5]	Research Methodology in Business
<b>4. 0.5 credit from:</b>	<b>0.5</b>
BUSI 5983 [0.5]	Qualitative Research Design
BUSI 5984 [0.5]	Quantitative Research Design
<b>5. 0.0 credit in:</b>	
BUSI 5987 [0.0]	M.Sc. Thesis Tutorial
<b>6. 2.0 credits in:</b>	<b>2.0</b>
BUSI 5989 [2.0]	M.Sc. Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits):

<b>1. 1.0 credit in:</b>	<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0]	Climate Seminar Series
<b>3. 1.0 credit in approved electives</b>	<b>1.0</b>
<b>4. 1.5 credits in:</b>	<b>1.5</b>
BUSI 5980 [0.5]	Foundations of Management Theory and Research
BUSI 5981 [0.5]	Statistics for Business Research
BUSI 5982 [0.5]	Research Methodology in Business
<b>4. 0.5 credit from:</b>	<b>0.5</b>
BUSI 5983 [0.5]	Qualitative Research Design
BUSI 5984 [0.5]	Quantitative Research Design
<b>6. 1.0 credit in:</b>	<b>1.0</b>
BUSI 5988 [1.0]	M.Sc. Research Essay (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

#### Research Tutorial

Students working with their supervisors will identify appropriate research topics and questions and will be mentored on how to conduct their thesis research. Research seminar attendance and participation are required.

#### Thesis

BUSI 5989 M.Sc. Thesis is equivalent to 2.0 credits and should relate to issues consistent with the general focus of the M.Sc. program. The thesis must represent the results of the candidate's independent research undertaken after being admitted to graduate studies at Carleton University's Sprott School of Business. Previous work of the candidate may be used only as introductory or background material for the thesis.

A candidate may carry on research work related to the thesis off-campus, provided that the work is approved in advance and arrangements have been made for regular supervision of research thesis activities with the Director of Graduate Research Programs.

Before registering in BUSI 5989, students must first complete a thesis proposal and have their research topic approved in BUSI 5987 M.Sc. Thesis Tutorial.

Each candidate submitting a thesis will be required to pass an oral examination on the subject of the thesis.

#### Transfer from the Master's to the Ph.D. Program

Students enrolled full-time in the M.Sc. in Management program at Carleton University may be permitted to transfer into the Ph.D. program without completing the master's program, provided they meet the following conditions:

- Completion of 2.5 credits of master's courses with a minimum average of A
- Have demonstrated exceptional research potential
- Make a formal application for admission to the Ph.D. program no later than the third term of initial registration in the M.Sc. program
- Have permission of the Director of Graduate Research Programs.

#### Ph.D. Management (5.0 credits)

This degree can be pursued on a full-time or part-time basis.

##### Requirements:

<b>1. 1.5 credits in research and analysis methods</b>	<b>1.5</b>
<b>2. 1.5 credits in seminar courses in functional areas of business, including at least one functional pair of courses</b>	<b>1.5</b>
<b>3. 1.5 credits from a selection of course electives approved by the thesis supervisor or mentor</b>	<b>1.5</b>
4. Presentation and oral defence of the thesis proposal	0.5
5. A Thesis, which must be defended at an oral examination	0.0
6. One written and one oral comprehensive examination	
7. Participation in the Sprott School of Business research seminar series	
8. Participation in the Sprott School of Business teaching seminar series	
9. Classroom teaching or equivalent research supported seminar delivery to professional audiences	
<b>Total Credits</b>	<b>5.0</b>

##### Specific course requirements

All students in the doctoral program are required to complete the following courses successfully:

<b>1. 1.5 credits (BUSI 6902 and BUSI 6905 are mandatory) in:</b>	<b>1.5</b>
BUSI 6902 [0.5]	Research Methodology in Business
BUSI 6903 [0.5]	Qualitative Research Design
BUSI 6904 [0.5]	Quantitative Research Design
BUSI 6905 [0.5]	Advanced Statistical Methods for Business Research
<b>2. 1.5 credits in seminars including at least one functional pair of courses, from the following doctoral seminar courses:</b>	<b>1.5</b>
BUSI 6000 [0.5]	Seminar in Accounting I
& BUSI 6001 [0.5]	Seminar in Accounting II
BUSI 6100 [0.5]	Seminar in Management I: Modern Organization Theory
& BUSI 6101 [0.5]	Seminar in Management II: Current Topics in Organizational Behaviour
BUSI 6103 [0.5]	Seminar in Strategic Management
BUSI 6200 [0.5]	Seminar in Marketing I:
& BUSI 6201 [0.5]	Management and Strategy
	Seminar in Marketing II: Consumer Behaviour

BUSI 6300 [0.5] & BUSI 6301 [0.5]	Seminar in Management of Production/Operations I: Strategic Management of Production Systems Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface	
BUSI 6400 [0.5] & BUSI 6401 [0.5]	Seminar in Information Systems I: Research Issues Seminar in Information Systems II: Current Trends	
BUSI 6500 [0.5] & BUSI 6501 [0.5]	Seminar in Finance I: Topical issues in Investments Seminar in Finance II: Theories and Empirical Methods in Corporate Finance	
BUSI 6600 [0.5]	Entrepreneurship	
BUSI 6700 [0.5] & BUSI 6705 [0.5]	Seminar in International Business I: International Markets and Strategy Seminar in International Business II: Managing in a Global Environment	
3. The remaining 1.5 credits will be electives that are chosen with the approval of the thesis supervisor to assist in the thesis research process. Courses may be chosen from the list below, from the lists above or from outside the School in a supporting discipline with permission.		1.5
BUSI 6009 [0.5]	Special Topics in Accounting	
BUSI 6104 [0.5]	Managing the Change Process	
BUSI 6109 [0.5]	Special Topics in Management	
BUSI 6209 [0.5]	Special Topics in Marketing	
BUSI 6303 [0.5]	Systems Optimization: Methods and Models	
BUSI 6304 [0.5]	Management of Innovation and Technology	
BUSI 6306 [0.5]	Advanced Methods and Models of Management Science	
BUSI 6309 [0.5]	Special Topics in Operations Management	
BUSI 6409 [0.5]	Special Topics in Information Systems	
BUSI 6509 [0.5]	Special Topics in Finance	
BUSI 6709 [0.5]	Special Topics in International Business	
BUSI 6900 [0.5]	Directed Readings	
BUSI 6901 [0.5]	Special Topics	
BUSI 6910 [0.5]	Foundations of Management Theory and Research	
4. 0.5 credits in:		0.5
BUSI 6907 [0.5]	Ph.D. Thesis Tutorial	
5. 0.0 credit in:		0.0
BUSI 6909 [0.0]	Ph.D. Thesis	

**Directed Reading:** a student may, with the approval of his or her thesis supervisor, take up to two directed readings courses (BUSI 6900 Directed Readings). These courses should relate directly to the student's thesis work.

## Second Point of Entry

Doctoral students who hold an M.Sc. in Management from Carleton University and have been admitted to the second point of entry are required to complete the following courses successfully:

1. 0.5 credit in:		0.5
BUSI 6905 [0.5]	Advanced Statistical Methods for Business Research	
2. 0.5 credit to complete a functional pair of courses (I+II), based on previous coursework or a course taken from item 3 or 4.		0.5
BUSI 6000 [0.5] or BUSI 6001 [0.5]	Seminar in Accounting I Seminar in Accounting II	
BUSI 6100 [0.5] or BUSI 6101 [0.5]	Seminar in Management I: Modern Organization Theory Seminar in Management II: Current Topics in Organizational Behaviour	
BUSI 6200 [0.5] or BUSI 6201 [0.5]	Seminar in Marketing I: Management and Strategy Seminar in Marketing II: Consumer Behaviour	
BUSI 6300 [0.5] or BUSI 6301 [0.5]	Seminar in Management of Production/Operations I: Strategic Management of Production Systems Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface	
BUSI 6400 [0.5] or BUSI 6401 [0.5]	Seminar in Information Systems I: Research Issues Seminar in Information Systems II: Current Trends	
BUSI 6500 [0.5] or BUSI 6501 [0.5]	Seminar in Finance I: Topical issues in Investments Seminar in Finance II: Theories and Empirical Methods in Corporate Finance	
BUSI 6700 [0.5] or BUSI 6705 [0.5]	Seminar in International Business I: International Markets and Strategy Seminar in International Business II: Managing in a Global Environment	
3. 0.5 credit in functional seminars, from any of the courses listed above in item 2, or BUSI 6103 [0.5] Seminar in Strategic Management, or BUSI 6600 [0.5] Entrepreneurship. With departmental permission, students who have previously and successfully completed at least 1.0 credit in functional seminars at the masters level may replace this requirement with an appropriate graduate elective.		0.5
4. 0.5 credit in an elective chosen with the approval of the thesis supervisor to assist in the thesis research process. Courses may be chosen from the list below, from the lists above or from outside the School in a supporting discipline with permission.		0.5
BUSI 6009 [0.5]	Special Topics in Accounting	
BUSI 6104 [0.5]	Managing the Change Process	
BUSI 6109 [0.5]	Special Topics in Management	
BUSI 6209 [0.5]	Special Topics in Marketing	
BUSI 6303 [0.5]	Systems Optimization: Methods and Models	
BUSI 6304 [0.5]	Management of Innovation and Technology	

BUSI 6306 [0.5]	Advanced Methods and Models of Management Science	
BUSI 6309 [0.5]	Special Topics in Operations Management	
BUSI 6409 [0.5]	Special Topics in Information Systems	
BUSI 6509 [0.5]	Special Topics in Finance	
BUSI 6709 [0.5]	Special Topics in International Business	
BUSI 6900 [0.5]	Directed Readings	
BUSI 6901 [0.5]	Special Topics	
BUSI 6910 [0.5]	Foundations of Management Theory and Research	
<b>5. 0.5 credit in:</b>		0.5
BUSI 6907 [0.5]	Ph.D. Thesis Tutorial	
<b>6. 0.0 credit in:</b>		0.0
BUSI 6909 [0.0]	Ph.D. Thesis	

### Comprehensive Examinations

All Ph.D. candidates are required to successfully complete a comprehensive examination. The examination will cover material relating to the student's area of specialization, research methodology associated with that area, and important works in the management field. Questions for the examination will be set by the student's comprehensive examination committee. The comprehensive examination will take place over a period of two to three weeks and will consist of a written and an oral part.

The comprehensive examinations must be completed successfully before the Ph.D. proposal defense is scheduled. Under normal circumstances, the written comprehensive and the oral defense must occur within eight terms of a full-time student's initial registration in the Ph.D. program. Part-time students should complete the comprehensives within sixteen terms of initial registration in the Ph.D. program. Students who do not fulfil this requirement will be asked to withdraw from the program.

### Regulations

See the General Regulations section of this Calendar.

### Academic Standing

A grade of B- or higher is normally required in each credit counted towards the degree. However, a candidate may, with the recommendation of the School and the approval of the Vice Provost (Graduate Studies), be allowed to count a grade of C+ in 0.5 credit.

Withdrawal from the program will be required if an M.Sc. student:

- Receives a grade of lower than B- in 1.0 credit or more, or
- Fails to achieve a weighted GPA of 7.0 after completing 2.0 credits of study, or to maintain it, or
- Receives a grade lower than C+ in the same course more than once.

### M.Sc. Management

Admission into the M.Sc. in Management program will be judged primarily on the applicant's potential to undertake

research successfully and his/her prospects for completion of the program. Applicants will submit a research proposal statement on applying to the program.

The normal requirement for admission to the master's program in management is an Honours Bachelor of Commerce degree (or equivalent, e.g. 4-year Commerce, Bachelor of Business Administration or similar degrees) with at least a B+ average. Applicants who do not meet the normal requirements for admission may be required to complete additional courses, extra to the normal program requirements.

All applicants to the program are required to submit a GMAT (Graduate Management Admission Test) score with a minimum of 600 or an equivalent GRE (Graduate Record Exam) score. To calculate the equivalent GRE score, applicants can use the GRE Comparison Table for Business Schools.

### Transfer from the Master's to the Ph.D. Program

Students enrolled full-time in the M.Sc. in Management program at Carleton University may be permitted to transfer into the Ph.D. program without completing the master's program, provided they meet the following conditions:

- Completion of 2.5 credits of master's courses with a minimum average of A
- Have demonstrated exceptional research potential
- Make a formal application for admission to the Ph.D. program no later than the third term of initial registration in the M.Sc. program
- Have permission of the Director of Graduate Research Programs.

### Regulations - PhD

See the General Regulations section of this Calendar.

Academic Standing: doctoral students must normally obtain a grade of B- or better in each credit, and Satisfactory on the comprehensive examinations, the Ph.D. thesis and its oral defence.

### Ph.D. Management

Admission into the Ph.D. Management program will be judged primarily on the applicant's ability to undertake research successfully and his/her prospects for completion of the program.

The normal requirement for admission to the doctoral program in management is a master's degree (or equivalent) in business or a related field with an A-average and a bachelor's degree. A number of years of work experience is desirable.

A student enrolled in a research-based master's program in business who has completed a minimum of 2.5 credits and who has shown outstanding academic performance and research promise may be admitted to the Ph.D. program without completing the master's program. Normal Ph.D. program requirements, as stated below, will apply. Each case will be considered on an individual basis for advanced standing in the Ph.D. program. Advanced standing will be considered for a maximum of 1.5 credits.

Applicants who have completed a thesis-based master's program in business or a related area may have their program requirements adjusted at the time of admission.

Applicants who have completed the M.Sc. Management at Carleton University may be eligible for admission to a second point of entry, to be determined by the Sprott School of Business and Graduate Studies, as outlined in the program requirements.

All Ph.D. candidates, regardless of their previous field of specialization, are expected to have or to acquire a basic knowledge of statistics and at least two of the following areas of management: accounting, finance, information systems, international business, management science, marketing, organizational behaviour, and productions/operations management. Students will be admitted to the program with a course of study designed where appropriate to supplement previous education, experience, and training.

Graduate Management Admission Test (GMAT) - the School requires that all applicants submit scores obtained in the Graduate Management Admission Test (GMAT) offered by the Graduate Management Admission Council (GMAC). Successful candidates will normally have a GMAT score of at least 600. Equivalent GRE scores (as defined by the Educational Testing Service) may be considered.

All applicants whose first language is not English must be tested for proficiency in the English language. See Section 3.6 of the General Regulations section of this Calendar for details.

### **Transfer from the Master's to the Ph.D. Program**

Students enrolled full-time in the M.Sc. in Management program at Carleton University may be permitted to transfer into the Ph.D. program without completing the master's program, provided they meet the following conditions:

- Completion of 2.5 credits of master's courses with a minimum average of A
- Have demonstrated exceptional research potential
- Make a formal application for admission to the Ph.D. program no later than the third term of initial registration in the M.Sc. program
- Have permission of the Director of Graduate Research Programs.

### **Business (BUSI) Courses**

#### **BUSI 5001 [1.0 credit]**

##### **MBA Integrative Foundation**

An interdisciplinary learning experience that underscores the connections between strategy, ethics, and the global business environment. Includes a range of pedagogical approaches that challenge students and help them see business issues through multiple lenses.

Includes: Experiential Learning Activity

Precludes additional credit for STGY 5903, BUSI 5802, IBUS 5701.

#### **BUSI 5080 [0.5 credit]**

##### **Seminar in Accounting I**

Foundations in accounting theory and research methods in financial accounting, management accounting, taxation and assurance.

Also offered, with different requirements, as BUSI 6000, for which additional credit is precluded.

#### **BUSI 5081 [0.5 credit]**

##### **Seminar in Accounting II**

Research methods, theory and practice in reporting, performance measurement, control, risk management and governance.

Also offered, with different requirements, as BUSI 6001, for which additional credit is precluded.

#### **BUSI 5106 [0.25 credit]**

##### **Business Case Analysis and Presentations**

Introduction to, and practical application of, the methods and tools of rigorous business case analysis and the design of strategic responses, including the preparation and delivery of presentations designed to convince decision makers of the validity of the analysis and strategic response.

Includes: Experiential Learning Activity

#### **BUSI 5108 [0.25 credit]**

##### **Sustainable Business Development**

An integration of sustainable business strategies examining corporate perspectives on environmental and social issues, and the implications on stakeholder management strategies. Students will apply concepts of sustainable business development in analyzing successful and flawed organizational strategies drawn from current business literature.

Includes: Experiential Learning Activity

#### **BUSI 5120 [0.5 credit]**

##### **Business and Environmental Sustainability**

Role of business in creating and responding to environmental challenges. Impact of various business models on environmental sustainability and the potential for business-driven solutions across a range of industry sectors.

Prerequisite(s): BUSI 5108.

Also offered at the undergraduate level, with different requirements, as BUSI 4120, for which additional credit is precluded.

**BUSI 5180 [0.5 credit]****Seminar in Management I: Modern Organization Theory**

The development of post-structuralist organization theory is examined. Theories of organizational culture and symbolism, political theories of organization, ethnomethodological, decision-based and population ecology approaches are investigated. The social, economic, and intellectual forces shaping organization theory provides a major focus. Also offered, with different requirements, as BUSI 6100, for which additional credit is precluded.

**BUSI 5181 [0.5 credit]****Seminar in Management II: Current Topics in Organizational Behaviour**

Current topics and debates in the research on organizational behaviour. Potential topics include motivation, learning, communication, decision-making, small group behaviour, leadership, careers, power and conflict. Also offered, with different requirements, as BUSI 6101, for which additional credit is precluded.

**BUSI 5280 [0.5 credit]****Seminar in Marketing I: Management and Strategy**

Marketing theory, history, and developments through the analysis, synthesis, and extension of theoretical and empirical papers on marketing management and strategy including all aspects of the marketing mix plus alliances, competitive advantage, global marketing strategies and segmenting, targeting and positioning. Also offered, with different requirements, as BUSI 6200, for which additional credit is precluded.

**BUSI 5281 [0.5 credit]****Seminar in Marketing II: Consumer Behaviour**

Consumer decision making theory and practice including information processing, behavioural decision theory and consumer culture theory perspectives. Also offered, with different requirements, as BUSI 6201, for which additional credit is precluded.

**BUSI 5380 [0.5 credit]****Seminar in Management of Production/Operations I: Strategic Management of Production Systems**

Developing a firm's strategies with respect to facilities, locations, technologies, vertical integration and sourcing arrangements. Recent developments in management policies and practices that enable production systems to excel and grow in the era of innovation-, cost-, time- and quality-based competition. Also offered, with different requirements, as BUSI 6300, for which additional credit is precluded.

**BUSI 5381 [0.5 credit]****Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface**

The evolution and management of process innovation; management of productivity and sustainability using process technologies; integration of production strategy and technology; and supply chain interactions with development chain. Topics include process re-engineering, quality function deployment, supply chain restructuring and the deployment of process innovations. Also offered, with different requirements, as BUSI 6301, for which additional credit is precluded.

**BUSI 5383 [0.5 credit]****Systems Optimization: Methods and Models**

Management science approaches in modeling systems for decision-making under certainty and uncertainty. Linear programming, network flows problems and applications, discrete optimization models, heuristics and metaheuristics, dynamic programming, nonlinear programming, simulation. Links between theory and application will be illustrated through case studies and applied modeling.

Includes: Experiential Learning Activity

Also offered, with different requirements, as BUSI 6303, for which additional credit is precluded.

**BUSI 5480 [0.5 credit]****Seminar in Information Systems I: Research Issues**

Research themes, approaches, and methods prevalent in the Information Systems area. Students will engage in examining research issues in IS and perform critical analyses of the research methodologies used to investigate and report on them.

Includes: Experiential Learning Activity

Also offered, with different requirements, as BUSI 6400, for which additional credit is precluded.

**BUSI 5481 [0.5 credit]****Seminar in Information Systems II: Current Trends**

Theory and practice in current information systems research.

Also offered, with different requirements, as BUSI 6401, for which additional credit is precluded.

**BUSI 5510 [0.5 credit]****Data Science for Business**

Application of advanced quantitative and qualitative techniques to collect, store, clean, analyze and visualize structured and unstructured data. Discussion of data-driven business decision making.

**BUSI 5580 [0.5 credit]****Seminar in Finance I: Topical Issues in Investments**

Selected topics in financial theory. Topics chosen according to new developments in theory and with the interests of the students in mind and may include theory of derivatives, pricing theory, information asymmetries, agency theory, economic efficiency, and empirical methods.

Also offered, with different requirements, as BUSI 6500, for which additional credit is precluded.

**BUSI 5581 [0.5 credit]****Seminar in Finance II: Theories and Empirical Methods in Corporate Finance**

Foundations for empirical research methodologies used in selected papers in finance; informational issues and their impact on capital market efficiency; economics of mergers and acquisitions, dividend and information; and emerging areas in finance such as market failures, corporate governance, financial crisis, and behavioural finance.

Also offered, with different requirements, as BUSI 6501, for which additional credit is precluded.

**BUSI 5780 [0.5 credit]****Seminar in International Business I: International Markets and Strategy**

An advanced examination of contemporary theory on the international expansion of the firm: Globalization, trade and investment flows, trade blocs, and free trade zones; consumers and culture; key actors in global markets; sequential internationalization, expansion modes, and location theory; strategy by firm size.

Also offered, with different requirements, as BUSI 6700, for which additional credit is precluded.

**BUSI 5781 [0.5 credit]****Seminar in International Business II: Managing in a Global Environment**

The role of culture, cognition, and behaviour as it relates to management theory and practices. Issues related to globalization, technology, and workplace diversity are explored through an investigation of cultural theories and their implications for cognition, behaviour, and management.

Also offered, with different requirements, as BUSI 6705, for which additional credit is precluded.

**BUSI 5801 [0.25 credit]****Statistics for Managers**

Techniques for using data to make an informed use of statistics. Applications, interpretation and limitations of results. Sampling, descriptive statistics, probability concepts, estimation and testing of hypotheses and regression, using practical business situations.

Precludes additional credit for BUSI 5904.

**BUSI 5802 [0.25 credit]****Business Ethics**

Impact of corporate decisions on society. Models and standards of business ethics and corporate social responsibility (CSR). Methods of measuring and reporting. The rise of corporate power, stakeholder analysis, corporate governance, sustainability, national and international pressures on CSR.

Precludes additional credit for BUSI 5001.

**BUSI 5900 [0.5 credit]****Tutorials/Directed Studies in Business**

Tutorials or directed readings in selected areas of business, involving presentation of papers as the basis for discussion with the tutor.

Prerequisite(s): GPA of 10.0 or higher and permission of the School.

**BUSI 5905 [0.5 credit]****Special Topics**

At the discretion of the School, a course dealing with selected topics of interest to students in the MBA Program. Topics will vary from year to year, and will be announced in advance of the registration period.

Prerequisite(s): Permission of the School.

**BUSI 5906 [0.25 credit]****Special Topics**

At the discretion of the School, a course dealing with selected topics of interest to students in the MBA program. Topics will vary from year to year, and will be announced in advance of the registration period.

Prerequisite(s): permission of the School.

**BUSI 5907 [0.5 credit]****M.B.A. Thesis Tutorial**

A seminar designed to help the student formulate and evaluate specific research topics. The successful submission of a thesis proposal is necessary for the completion of the course.

Prerequisite(s): admission to the program prior to the fall term of 2008 and permission of the M.B.A. Program Director.

**BUSI 5908 [1.0 credit]****M.B.A. Research Project**

Includes: Experiential Learning Activity

Prerequisite(s): admission to the program prior to the fall term of 2008 and permission of the M.B.A. Program Director.

**BUSI 5909 [1.5 credit]****M.B.A. Thesis Research**

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5907 and admission to the program prior to the fall term of 2008 and permission of the M.B.A. Program Director.

**BUSI 5980 [0.5 credit]****Foundations of Management Theory and Research**

Exploration of foundational works in management theory and research. Review of the foundational thinking of scholars that influenced and shaped the management discipline.

Also offered, with different requirements, as BUSI 6910, for which additional credit is precluded.

**BUSI 5981 [0.5 credit]****Statistics for Business Research**

In-depth examination and critique of statistical inference. Linear regression. Statistical computing software will be used.

**BUSI 5982 [0.5 credit]****Research Methodology in Business**

The study of research techniques commonly used in research on business and management issues. The development of knowledge of these methodologies and their application, and their possible use in the thesis research of the student.

Also offered, with different requirements, as BUSI 6902, for which additional credit is precluded.

**BUSI 5983 [0.5 credit]****Qualitative Research Design**

The use of qualitative data in business research.

Discussion of research design, data collection, analysis and interpretation techniques; overview of philosophy of science debates regarding epistemological and ontological stance, with practical experience.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5982.

Also offered, with different requirements, as BUSI 6903, for which additional credit is precluded.

**BUSI 5984 [0.5 credit]****Quantitative Research Design**

In-depth study of theories and assumptions of quantitative research design methodologies in management; exploration of alternative research designs; conceptual understanding and application of statistical methods for data analysis; critique of research from a variety of practice settings applying quantitative design methods; design a research project.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 5982.

Also offered, with different requirements, as BUSI 6904, for which additional credit is precluded.

**BUSI 5987 [0.0 credit]****M.Sc. Thesis Tutorial**

An intensive preparation for MSc thesis research, under the direction of one or more members of the school. The successful submission of a thesis proposal is necessary for the completion of this course.

**BUSI 5988 [1.0 credit]****M.Sc. Research Essay****BUSI 5989 [2.0 credits]****M.Sc. Thesis**

M.Sc. Thesis.

Includes: Experiential Learning Activity

**BUSI 5992 [0.25 credit]****Tutorials/Directed Studies in Business**

Tutorials or directed readings in selected areas of business, involving presentation of papers as the basis for discussion with the tutor.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School of Business.

**BUSI 5995 [0.5 credit]****Entrepreneurship**

Fundamentals of entrepreneurship and new venture creation. Topics include opportunity identification, innovation and idea generation, intellectual property and legal considerations, business models, organizational structure, new venture financing, and challenges associated with scaling up.

**BUSI 5997 [0.5 credit]****Project Based Service Learning**

An experiential work environment in which students serve as consultants for a real-world client. Various types of projects are possible depending on the company and their goals/needs. Clients may be internal (Carleton, Sprott) or external (large firm, start-up, individual entrepreneur, not-for-profit).

Includes: Experiential Learning Activity

Prerequisite(s): Permission of the School of Business.

Also offered at the undergraduate level, with different requirements, as BUSI 4800, for which additional credit is precluded.

**BUSI 5998 [0.0 credit]****MBA Skills Workshop**

Provides preparation for the MBA program, as well as professional and career development. The course is graded SAT/UNSAT based on attendance and engagement.

Includes: Experiential Learning Activity

**BUSI 5999 [1.0 credit]****Internship**

A degree requirement for students with less than two years of relevant experience within a professional environment. Focus on the application of MBA course knowledge and building management skills in a business environment.

Includes: Experiential Learning Activity

Prerequisite(s): successful completion of two academic terms; subject to approval by the MBA Office.

Minimum 480 hours.

**BUSI 6000 [0.5 credit]****Seminar in Accounting I**

Foundations in accounting theory and research methods in financial accounting, management accounting, taxation and assurance.

Also offered, with different requirements, as BUSI 5080, for which additional credit is precluded.

**BUSI 6001 [0.5 credit]****Seminar in Accounting II**

Research methods, theory and practice in reporting, performance measurement, control, risk management and governance.

Also offered, with different requirements, as BUSI 5081, for which additional credit is precluded.

**BUSI 6009 [0.5 credit]****Special Topics in Accounting**

Designed to expose students to new and emerging issues in selected areas of accounting research. The topics covered vary from year to year according to varied research expertise among the area faculty.

Prerequisite(s): permission of the School.

**BUSI 6100 [0.5 credit]****Seminar in Management I: Modern Organization Theory**

The development of post-structuralist organization theory is examined. Theories of organizational culture and symbolism, political theories of organization, ethnomethodological, decision-based and population ecology approaches are investigated. The social, economic, and intellectual forces shaping organization theory provides a major focus.

Also offered, with different requirements, as BUSI 5180, for which additional credit is precluded.

**BUSI 6101 [0.5 credit]****Seminar in Management II: Current Topics in Organizational Behaviour**

Current topics and debates in the research on organizational behaviour. Potential topics include motivation, learning, communication, decision-making, small group behaviour, leadership, careers, power and conflict.

Also offered, with different requirements, as BUSI 5181, for which additional credit is precluded.

**BUSI 6103 [0.5 credit]****Seminar in Strategic Management**

Current topics and debates in the research on strategic management, sustainable business development and corporate governance. Foundational theories to be reviewed may include agency, institutional, network, resource-based view, resource dependence, stakeholder, stewardship and transaction cost economics theories. Precludes additional credit for BUSI 6803 (no longer offered).

**BUSI 6104 [0.5 credit]****Managing the Change Process**

The process of organizational change and the external forces which drive such changes. Topics include both micro and macro theories of change and issues around change management such as leadership and resistance to change.

Precludes additional credit for BUSI 6704 (no longer offered).

**BUSI 6109 [0.5 credit]****Special Topics in Management**

Designed to expose students to new and emerging issues in selected areas of management research. The topics covered vary from year to year according to varied research expertise among the area faculty.  
Prerequisite(s): permission of the School.

**BUSI 6200 [0.5 credit]****Seminar in Marketing I: Management and Strategy**

Marketing theory, history, and developments through the analysis, synthesis, and extension of theoretical and empirical papers on marketing management and strategy including all aspects of the marketing mix plus alliances, competitive advantage, global marketing strategies and segmenting, targeting and positioning.  
Also offered, with different requirements, as BUSI 5280, for which additional credit is precluded.

**BUSI 6201 [0.5 credit]****Seminar in Marketing II: Consumer Behaviour**

Consumer decision making theory and practice including information processing, behavioural decision theory and consumer culture theory perspectives.  
Also offered, with different requirements, as BUSI 5281, for which additional credit is precluded.

**BUSI 6209 [0.5 credit]****Special Topics in Marketing**

Designed to expose students to new and emerging issues in selected areas of marketing research. The topics covered vary from year to year according to varied research expertise among the area faculty.  
Prerequisite(s): permission of the School.

**BUSI 6300 [0.5 credit]****Seminar in Management of Production/Operations I: Strategic Management of Production Systems**

Developing a firm's strategies with respect to facilities, locations, technologies, vertical integration and sourcing arrangements. Recent developments in management policies and practices that enable production systems to excel and grow in the era of innovation-, cost-, time- and quality-based competition.  
Also offered, with different requirements, as BUSI 5380, for which additional credit is precluded.

**BUSI 6301 [0.5 credit]****Seminar in Management of Production/Operations II: Production/Technology/Strategy Interface**

The evolution and management of process innovation; management of productivity and sustainability using process technologies; integration of production strategy and technology; and supply chain interactions with development chain. Topics include process reengineering, quality function deployment, supply chain restructuring and the deployment of process innovations.  
Also offered, with different requirements, as BUSI 5381, for which additional credit is precluded.

**BUSI 6303 [0.5 credit]****Systems Optimization: Methods and Models**

Management science approaches in modeling systems for decision-making under certainty and uncertainty. Linear programming, network flows problems and applications, discrete optimization models, heuristics and metaheuristics, dynamic programming, nonlinear programming, simulation. Links between theory and application will be illustrated through case studies and applied modeling.  
Includes: Experiential Learning Activity  
Precludes additional credit for BUSI 6703.  
Prerequisite(s): permission of the School.  
Also offered, with different requirements, as BUSI 5383, for which additional credit is precluded.

**BUSI 6304 [0.5 credit]****Management of Innovation and Technology**

Introduction to issues in the management of technology. Topics include: technology strategy and policy, technology forecasting and planning, the process of technology innovation from concept to market, research and development management, technology adoption, diffusion and implementation, technology transfer, and technology and social issues.  
Precludes additional credit for BUSI 6801 (no longer offered).

**BUSI 6306 [0.5 credit]****Advanced Methods and Models of Management Science**

Advanced study of decision-making under certainty and uncertainty. Preprocessing and reformulation methods, optimization theory for large scale problems; stochastic programming; metaheuristics; multicriteria analysis; simulation. Links between theory and application will be illustrated through case studies and applied modeling.  
Includes: Experiential Learning Activity  
Precludes additional credit for BUSI 6906 (no longer offered).  
Prerequisite(s): BUSI 6303 or permission of the School.

**BUSI 6309 [0.5 credit]****Special Topics in Operations Management**

Designed to expose students to new and emerging issues in selected areas of operations management research. The topics covered vary from year to year according to varied research expertise among the area faculty. Includes: Experiential Learning Activity  
Prerequisite(s): permission of the School.

**BUSI 6400 [0.5 credit]****Seminar in Information Systems I: Research Issues**

Research themes, approaches, and methods prevalent in the Information Systems area. Students will engage in examining research issues in IS and perform critical analyses of the research methodologies used to investigate and report on them.  
Also offered, with different requirements, as BUSI 5480, for which additional credit is precluded.

**BUSI 6401 [0.5 credit]****Seminar in Information Systems II: Current Trends**

Theory and practice in current information systems research.  
Also offered, with different requirements, as BUSI 5481, for which additional credit is precluded.

**BUSI 6409 [0.5 credit]****Special Topics in Information Systems**

Designed to expose students to new and emerging issues in selected areas of information systems research. The topics covered vary from year to year according to varied research expertise among the area faculty.  
Prerequisite(s): permission of the School.

**BUSI 6500 [0.5 credit]****Seminar in Finance I: Topical issues in Investments**

Selected topics in financial theory. Topics chosen according to new developments in theory and with the interests of the students in mind and may include theory of derivatives, pricing theory, information asymmetries, agency theory, economic efficiency, and empirical methods.  
Prerequisite(s): graduate-level finance courses or permission of the School.  
Also offered, with different requirements, as BUSI 5580, for which additional credit is precluded.

**BUSI 6501 [0.5 credit]****Seminar in Finance II: Theories and Empirical Methods in Corporate Finance**

Foundations for empirical research methodologies used in selected papers in finance; informational issues and their impact on capital market efficiency; economics of mergers and acquisitions, dividend and information; and emerging areas in finance such as market failures, corporate governance, financial crisis, and behavioural finance.  
Prerequisite(s): graduate-level finance courses or permission of the School.  
Also offered, with different requirements, as BUSI 5581, for which additional credit is precluded.

**BUSI 6509 [0.5 credit]****Special Topics in Finance**

Designed to expose students to new and emerging issues in selected areas of finance research. The topics covered vary from year to year according to varied research expertise among the area faculty.  
Prerequisite(s): permission of the School.

**BUSI 6600 [0.5 credit]****Entrepreneurship**

An examination of research in entrepreneurship focusing on theory building and empirical testing of factors that shapes the identification, evaluation and exploitation of opportunities and the creation of new organizations. Precludes additional credit for BUSI 6806 (no longer offered).

**BUSI 6700 [0.5 credit]****Seminar in International Business I: International Markets and Strategy**

An advanced examination of contemporary theory on the international expansion of the firm: Globalization, trade and investment flows, trade blocs, and free trade zones; consumers and culture; key actors in global markets; sequential internationalization, expansion modes, and location theory; strategy by firm size. Precludes additional credit for BUSI 6804 (no longer offered).  
Also offered, with different requirements, as BUSI 5780, for which additional credit is precluded.

**BUSI 6705 [0.5 credit]****Seminar in International Business II: Managing in a Global Environment**

The role of culture, cognition, and behaviour as it relates to management theory and practices. Issues related to globalization, technology, and workplace diversity are explored through an investigation of cultural theories and their implications for cognition, behaviour, and management.  
Also offered, with different requirements, as BUSI 5781, for which additional credit is precluded.

**BUSI 6709 [0.5 credit]****Special Topics in International Business**

Designed to expose students to new and emerging issues in selected areas of international business research. The topics covered vary from year to year according to varied research expertise among the area faculty.

Prerequisite(s): permission of the School.

**BUSI 6900 [0.5 credit]****Directed Readings**

Directed readings in selected areas of business, involving presentation of papers as the basis for discussion. A part of the requirement for the course may be participation in an advanced course at the undergraduate/graduate level.

Prerequisite(s): permission of the School.

**BUSI 6901 [0.5 credit]****Special Topics**

Designed to expose students to new and emerging issues in selected areas of business research. Integrative problems involving two or more areas of business research are also explored. The topics covered may vary from year to year.

Prerequisite(s): permission of the School.

**BUSI 6902 [0.5 credit]****Research Methodology in Business**

Research techniques commonly used in research on business and management issues. The development of knowledge of these methodologies and their application, and their possible use in the thesis research of the student.

Also offered, with different requirements, as BUSI 5982, for which additional credit is precluded.

**BUSI 6903 [0.5 credit]****Qualitative Research Design**

The use of qualitative data in business research.

Discussion of research design, data collection, analysis and interpretation techniques; overview of philosophy of science debates regarding epistemological and ontological stance; with practical experience.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 6902.

Also offered, with different requirements, as BUSI 5983, for which additional credit is precluded.

**BUSI 6904 [0.5 credit]****Quantitative Research Design**

In-depth study of theories and assumptions of quantitative research design methodologies in management; exploration of alternative research designs; conceptual understanding and application of statistical methods for data analysis; critique of research from a variety of practice settings applying quantitative design methods; design a research project.

Includes: Experiential Learning Activity

Prerequisite(s): BUSI 6902.

Also offered, with different requirements, as BUSI 5984, for which additional credit is precluded.

**BUSI 6905 [0.5 credit]****Advanced Statistical Methods for Business Research**

A practical introduction to advanced statistical methods used in business research, with particular focus on discrete categorical data. Topics include the analysis of two-way and three-way tables; loglinear modeling; logistic regression; generalized linear models. Students will analyze real data using appropriate software packages.

Includes: Experiential Learning Activity

**BUSI 6907 [0.5 credit]****Ph.D. Thesis Tutorial**

An intensive preparation for Ph.D. thesis research, under the direction of one or more members of the School. The successful submission of a thesis proposal is necessary for the completion of the course.

**BUSI 6908 [0.0 credit]****Ph.D. Comprehensives**

Preparation for comprehensive examinations.

**BUSI 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

**BUSI 6910 [0.5 credit]****Foundations of Management Theory and Research**

Exploration of foundational works in management theory and research. Review of the foundational thinking of scholars that influenced and shaped the management discipline.

Also offered, with different requirements, as BUSI 5980, for which additional credit is precluded.

## Mathematics and Statistics

This section presents the requirements for programs in:

- **M.Sc. Mathematics with Concentration in Mathematics**
- **M.Sc. Mathematics and Statistics with Specialization in Bioinformatics**
- **M.Sc. Mathematics with Concentration in Statistics**
- **Ph.D. Mathematics and Statistics**

### Program Requirements

Students must complete the requirements for the concentration in Mathematics or the concentration in Statistics. The M.Sc. in Mathematics and Statistics: Specialization in Bioinformatics is part of the M.Sc. in Mathematics and Statistics with Concentration in Mathematics. The M.Sc. in Mathematics and Statistics: Specialization in Biostatistics is part of the M.Sc. in Mathematics and Statistics with Concentration in Statistics.

- 2.0 credits in course work and 2.0 credits in a thesis, or
- 3.0 credits in course work and 1.0 credit in a research project, or
- 4.0 credits in course work.

### M.Sc. Mathematics with Concentration in Mathematics (4.0 credits)

#### Requirements - Thesis Option (4.0 credits)

1. 2.0 credits in course work	2.0
2. 2.0 credits from:	2.0
MATH 5909 [2.0] M.Sc. Thesis in Mathematics	
<b>Total Credits</b>	<b>4.0</b>

#### Requirements - Research Project option (4.0 credits)

1. 3.0 credits in course work	3.0
2. 1.0 credit from:	1.0
MATH 5910 [1.0] M.Sc. Project in Mathematics	
<b>Total Credits</b>	<b>4.0</b>

#### Requirements - Course work option (4.0 credits)

1. 4.0 credits in courses	4.0
<b>Total Credits</b>	<b>4.0</b>

#### Notes:

1. Students must receive approval for course selection from their supervisor before registering in courses.
2. More than one half of the total required credits must be completed in the Concentration in Mathematics.
3. All master's students should normally participate in a seminar or research talks under the guidance of their supervisors.
4. A maximum of 1.0 credit taken outside of the School of Mathematics and Statistics at Carleton University or the Department of Mathematics and Statistics at the University of Ottawa may be allowed for credit, subject to the approval of the School.

### M.Sc. Mathematics and Statistics with Specialization in Bioinformatics (4.5 credits)

#### Requirements:

1. 1.0 credit in:	1.0
BIOL 5515 [0.5] Bioinformatics	
BIOL 5517 [0.5] Bioinformatics Seminar	
2. 1.5 credits in coursework	1.5
3. 2.0 credits in:	2.0
MATH 5909 [2.0] M.Sc. Thesis in Mathematics (on an approved bioinformatics topic)	
<b>Total Credits</b>	<b>4.5</b>

1. Students must receive approval for course selection from their supervisor before registering in courses.
2. All master's students should normally participate in a seminar or research talks under the guidance of their supervisors.

### M.Sc. Mathematics with Concentration in Statistics (4.0 credits)

#### Requirements - Thesis Option (4.0 credits)

1. 2.0 credits in course work	2.0
2. 2.0 credits in:	2.0
STAT 5909 [2.0] M.Sc. Thesis in Statistics	
<b>Total Credits</b>	<b>4.0</b>

#### Requirements - Research Project option (4.0 credits)

1. 3.0 credits in course work	3.0
2. 1.0 credit in:	1.0
STAT 5910 [1.0] M.Sc. Project in Statistics	
<b>Total Credits</b>	<b>4.0</b>

#### Requirements - Course work option (4.0 credits)

1. 4.0 credits in courses	4.0
<b>Total Credits</b>	<b>4.0</b>

#### Notes:

1. Students must receive approval for course selection from their supervisor before registering in courses.
2. More than one half of the total required credits must be completed in the Concentration in Statistics.
3. All master's students should normally participate in a seminar or research talks under the guidance of their supervisors.
4. A maximum of 1.0 credit taken outside of the School of Mathematics and Statistics at Carleton University or the Department of Mathematics and Statistics at the University of Ottawa may be allowed for credit, subject to the approval of the School.

### Course Selection

#### Concentration in Mathematics

##### Mathematics

All MATH courses are eligible for the Concentration in Mathematics.

##### Statistics

In addition, the following STAT courses may be used toward the Concentration in Mathematics:

STAT 5501 [0.5]	Mathematical Statistics II
STAT 5504 [0.5]	Stochastic Processes and Time Series Analysis
STAT 5600 [0.5]	Mathematical Statistics I
STAT 5601 [0.5]	Stochastic Optimization
STAT 5604 [0.5]	Stochastic Analysis
STAT 5701 [0.5]	Stochastic Models
STAT 5704 [0.5]	Network Performance
STAT 5708 [0.5]	Probability Theory I
STAT 5709 [0.5]	Probability Theory II

## Concentration in Statistics

### Statistics

All STAT courses are eligible for the Concentration in Statistics

## Undergraduate Courses

With the exception of students in the coursework option, all courses must be taken at the graduate level. Students in the coursework option may take up to 1.0 credit of undergraduate courses at the 4000 level from the following list:

MATH 4002 [0.5]	Fourier Analysis (Honours)
MATH 4105 [0.5]	Rings and Modules (Honours)
MATH 4107 [0.5]	Commutative Algebra (Honours)
MATH 4109 [0.5]	Fields and Coding Theory (Honours)
MATH 4207 [0.5]	Foundations of Geometry (Honours)
MATH 4208 [0.5]	Introduction to Differentiable Manifolds (Honours)
MATH 4700 [0.5]	Partial Differential Equations (Honours)
MATH 4703 [0.5]	Dynamical Systems (Honours)
MATH 4801 [0.5]	Topics in Combinatorics (Honours)
MATH 4802 [0.5]	Introduction to Mathematical Logic (Honours)
MATH 4803 [0.5]	Computable Functions (Honours)
MATH 4806 [0.5]	Numerical Linear Algebra (Honours)
MATH 4808 [0.5]	Graph Theory and Algorithms (Honours)
MATH 4811 [0.5]	Combinatorial Design Theory (Honours)
STAT 4501 [0.5]	Probability Theory (Honours) (may be used toward the Concentration in Mathematics)
STAT 4502 [0.5]	Survey Sampling (Honours)
STAT 4504 [0.5]	Statistical Design and Analysis of Experiments (Honours)
STAT 4506 [0.5]	Nonparametric Statistics (Honours)
STAT 4555 [0.5]	Monte Carlo Simulation (Honours) (may be used toward the Concentration in Mathematics)
STAT 4601 [0.5]	Data Mining I (Honours)
STAT 4603 [0.5]	Time Series and Forecasting (Honours)
STAT 4604 [0.5]	Statistical Computing (Honours)
All MATH courses are eligible for the Concentration in Mathematics.	

All STAT courses are eligible for the Concentration in Statistics.

## Ph.D. Mathematics and Statistics (3.0 credits)

### Requirements:

- 3.0 credits in courses** 3.0
- 0.0 credits from:** 0.0
 

MATH 6909 [0.0]	Ph.D. Thesis (including a final oral examination on the thesis subject)
STAT 6909 [0.0]	Ph.D. Thesis (including a final oral examination on the thesis subject)
- All candidates must take comprehensive examinations. See note on Comprehensive Examinations below.

**Total Credits** 3.0

## Comprehensive Examinations

Students specializing in mathematics or probability undertake a comprehensive examination in the following areas:

- The candidate's general area of specialization at the Ph.D. level
- Examinations on two topics chosen from applied analysis, discrete applied mathematics, algebra, analysis, probability, topology, and statistics.

Students specializing in statistics must write an examination in the following areas:

- Mathematical statistics which includes multivariate analysis
- An examination in probability, and
- An examination in either (i) applied statistics or (ii) analysis.

In all cases, the examination must be completed successfully within twenty months of initial registration in the Ph.D. program in the case of full-time students, and within thirty-eight months of initial registration in the case of part-time students.

All Ph.D. candidates are also required to undertake a final oral examination on the subject of their thesis.

## Regulations

See the General Regulations section of this Calendar.

## Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the following programs is considered a regularly scheduled break approved by the University.

- M.Sc. Mathematics with Concentration in Mathematics (coursework and research essay pathways)
- M.Sc. Mathematics with Concentration in Statistics (coursework and research essay pathways)
- M.Sc. Mathematics and Statistics with Collaborative Specialization in Biostatistics (coursework pathway)

Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or

Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### **Admission**

The normal requirement for admission to the master's program is an honours bachelor's degree in mathematics, statistics or the equivalent, with B+ or higher in the honours subject and B- or higher overall. Details are outlined in the General Regulations section of this Calendar.

### **Admission**

The normal requirement for admission to the Ph.D. program is a master's degree in mathematics, or the equivalent, with at least B+ standing. Details are outlined in the General Regulations section of this Calendar.

### **Epidemiology - Joint (EPIJ) Courses**

#### **EPIJ 5240 [0.5 credit] (EPI 5240) Epidemiology**

#### **EPIJ 5241 [0.5 credit] (EPI 5241) Epidemiology II**

#### **EPIJ 5330 [0.5 credit] (EPI 5330) Vital and Health Statistics**

#### **EPIJ 5340 [0.25 credit] (5340) Epidemiological Methods**

Major principles of study design and analysis: validity in epidemiologic studies; precision and statistics in epidemiology studies; confounding; additive and multiplicative interaction; stratified analysis; regression models; regression modeling; bias analysis; analytical strategy.

Includes: Experiential Learning Activity

Prerequisite(s): EPI 5240, (EPI 5242 or MAT 5375).

#### **EPIJ 5344 [0.25 credit] (EPI 5344) Survival Analysis in the Health Sciences**

Types of survival data. Hazard function and its links to incidence rate/density. Nonparametric analysis including actuarial life tables, Kaplan-Meier method and log-rank test. Proportional hazards (Cox regression) modeling. Methods for time varying covariates and non-proportional hazards. SAS software for hands-on modeling.

Includes: Experiential Learning Activity

Prerequisite(s): EPI 5340.

#### **EPIJ 5345 [0.25 credit] (EPI 5340)**

##### **Applied Logistic Regression**

Foundation of model estimation: maximum likelihood; modeling dichotomous outcome (dependent) variables: logistic regression; logistic models with several independent variables; interpretation of model parameters; model-building strategies; assessing the fit of the model; regression diagnostics. Classes will include hands-on modeling examples using SAS statistical software.

Includes: Experiential Learning Activity

Prerequisite(s): EPI 5340.

#### **EPIJ 5346 [0.25 credit] (EPI 5346)**

##### **Applied Longitudinal and Clustered Data Analysis**

Introduction to longitudinal (repeated measures) and clustered data and overview of regression models for correlated data; linear mixed effects models: modelling the mean; modelling the covariance structure; generalized estimating equations and generalized linear mixed effects models; regression diagnostics; missing data and drop-out; case studies.

Includes: Experiential Learning Activity

Prerequisite(s): EPI 5340.

#### **EPIJ 6178 [0.5 credit] (EPI 6178) Clinical Trials**

#### **EPIJ 6278 [0.5 credit] (EPI 6278) Advanced Clinical Trials**

### **Mathematics (MATH) Courses**

#### **MATH 5001 [0.5 credit] (MAT 5144) Commutative Algebra**

Prime spectrum of a commutative ring (as a topological space); localization of rings and modules; tensor product of modules and algebras; Hilbert's Nullstellensatz and consequences for finitely generated algebras; Krull dimension of a ring; integral dependence, going-up, going-down; Noether Normalization Lemma and dimension theory.

#### **MATH 5002 [0.5 credit] (MAT 5149) Algebraic Geometry**

Brief overview of commutative algebra, Hilbert's Nullstellensatz, algebraic sets, and Zariski topology. Affine and projective varieties over algebraically closed fields. Regular functions and rational maps. Additional topics.

#### **MATH 5003 [0.5 credit] (MAT 5122) Banach Algebras**

Commutative Banach algebras; the space of maximal ideals; representation of Banach algebras as function algebras and as operator algebras; the spectrum of an element. Special types of Banach algebras: for example, regular algebras with involution, applications.

**MATH 5007 [0.5 credit] (MAT 5125)****Real Analysis I (Measure Theory and Integration)**

General measure and integral, Lebesgue measure and integration on  $\mathbb{R}$ , Fubini's theorem, Lebesgue-Radon-Nikodym theorem, absolute continuity and differentiation,  $L^p$ -spaces. Selected topics such as Daniell-Stone theory. Also offered at the undergraduate level, with different requirements, as MATH 4007, for which additional credit is precluded.

**MATH 5008 [0.5 credit] (MAT 5126)****Real Analysis II (Functional Analysis)**

Banach and Hilbert spaces, bounded linear operators, dual spaces. Topics selected from: weak-topologies, Alaoglu's theorem, compact operators, differential calculus in Banach spaces, Riesz representation theorems. Prerequisite(s): MATH 5007 (MAT 5125) or permission of the School.

Also offered at the undergraduate level, with different requirements, as MATH 4003, for which additional credit is precluded.

**MATH 5102 [0.5 credit] (MAT 5148)****Group Representations and Applications**

An introduction to group representations and character theory, with selected applications.

**MATH 5103 [0.5 credit] (MAT 5146)****Rings and Modules**

Generalizations of the Wedderburn-Artin theorem and applications, homological algebra.

**MATH 5104 [0.5 credit] (MAT 5143)****Lie Algebras**

Basic concepts: ideals, homomorphisms, nilpotent, solvable, semi-simple. Representations, universal enveloping algebra. Semi-simple Lie algebras: structure theory, classification, and representation theory. Prerequisite(s): MATH 5107 (MAT 5141) and MATH 5109 (MAT 5142) or permission of the School.

**MATH 5106 [0.5 credit] (MAT 5145)****Group Theory**

Fundamental principles as applied to abelian, nilpotent, solvable, free, and finite groups; representations. Also offered at the undergraduate level, with different requirements, as MATH 4106, for which additional credit is precluded.

**MATH 5107 [0.5 credit] (MAT 5141)****Algebra I: Rings and Modules**

Noetherian and artinian modules and rings. Varieties, Hilbert Basis Theorem, radical ideals, Hilbert Nullstellensatz. Localization and tensor products of modules and algebras. Semisimple rings and modules, Schur's Lemma, Jacobson Density Theorem, Artin-Wedderburn Theorem. Short exact sequences. Free, projective, injective and flat modules.

**MATH 5108 [0.5 credit] (MAT 5147)****Homological Algebra and Category Theory**

Axioms of set theory, categories, functors, natural transformations; free, projective, injective and flat modules; tensor products and homology functors, derived functors; dimension theory. Also offered at the undergraduate level, with different requirements, as MATH 4108, for which additional credit is precluded.

**MATH 5109 [0.5 credit] (MAT 5142)****Algebra II: Groups and Galois Theory**

Group actions, class equation, Sylow theorems, central composition and derived series, Jordan-Holder theorem, field extensions and minimal polynomials, algebraic closure, separable extensions, integrality, Galois groups, fundamental theorem of Galois theory, finite fields, cyclotomic field extensions, fundamental theorem of algebra, transcendental extensions.

**MATH 5201 [0.5 credit] (MAT 5150)****Topics in Geometry**

Various axiom systems of geometry. Detailed examinations of at least one modern approach to foundations, with emphasis upon the connections with group theory.

**MATH 5205 [0.5 credit] (MAT 5151)****Topology I**

Topological spaces, product and identification topologies, countability and separation axioms, compactness, connectedness, homotopy, fundamental group, net and filter convergence. Also offered at the undergraduate level, with different requirements, as MATH 4205, for which additional credit is precluded.

**MATH 5206 [0.5 credit] (MAT 5152)****Topology II**

Covering spaces, homology via the Eilenberg-Steenrod Axioms, applications, construction of a homology functor. Prerequisite(s): MATH 5205 (MAT 5151) or permission of the School.

Also offered at the undergraduate level, with different requirements, as MATH 4206, for which additional credit is precluded.

**MATH 5207 [0.5 credit] (MAT 5169)****Foundations of Geometry**

A study of at least one modern axiom system of Euclidean and non-Euclidean geometry, embedding of hyperbolic and Euclidean geometries in the projective plane, groups of motions, models of non-Euclidean geometry.

**MATH 5208 [0.5 credit] (MAT 5155)****Differentiable Manifolds**

A study of differentiable manifolds from the point of view of either differential topology or differential geometry. Topics such as smooth mappings, transversality, intersection theory, vector fields on manifolds, Gaussian curvature, Riemannian manifolds, differential forms, tensors, and connections are included.

**MATH 5300 [0.5 credit] (MAT 5160)****Mathematical Cryptography**

Analysis of cryptographic methods used in authentication and data protection, with particular attention to the underlying mathematics, e.g. Algebraic Geometry, Number Theory, and Finite Fields. Advanced topics on Public-Key Cryptography: RSA and integer factorization, Diffie-Hellman, discrete logarithms, elliptic curves. Topics in current research.

**MATH 5301 [0.5 credit] (MAT 5161)****Mathematical Logic**

A basic graduate course in mathematical logic. Propositional and predicate logic, proof theory, Gentzen's Cut-Elimination, completeness, compactness, Henkin models, model theory, arithmetic and undecidability. Special topics (time permitting) depending on interests of instructor and audience.

**MATH 5305 [0.5 credit] (MAT 5163)****Analytic Number Theory**

Dirichlet series, characters, Zeta-functions, prime number theorem, Dirichlet's theorem on primes in arithmetic progressions, binary quadratic forms.

**MATH 5306 [0.5 credit] (MAT 5164)****Algebraic Number Theory**

Algebraic number fields, bases, algebraic integers, integral bases, arithmetic in algebraic number fields, ideal theory, class number.

Also offered at the undergraduate level, with different requirements, as MATH 4306, for which additional credit is precluded.

**MATH 5403 [0.5 credit] (MAT 5187)****Topics in Applied Mathematics****MATH 5405 [0.5 credit] (MAT 5131)****Ordinary Differential Equations**

Linear systems, fundamental solution. Nonlinear systems, existence and uniqueness, flow. Equilibria, periodic solutions, stability. Invariant manifolds and hyperbolic theory. One or two specialized topics taken from, but not limited to: perturbation and asymptotic methods, normal forms and bifurcations, global dynamics.

**MATH 5406 [0.5 credit] (MAT 5133)****Partial Differential Equations**

First-order equations, characteristics method, classification of second-order equations, separation of variables, Green's functions.  $L_p$  and Sobolev spaces, distributions, variational formulation and weak solutions, Lax-Milgram theorem, Galerkin approximation. Parabolic PDEs. Wave equations, hyperbolic systems, nonlinear PDEs, reaction-diffusion equations, infinite-dimensional dynamical systems, regularity.

**MATH 5407 [0.5 credit] (MAT 5134)****Topics in Partial Differential Equations**

Theory of distributions, initial-value problems based on two-dimensional wave equations, Laplace transform, Fourier integral transform, diffusion problems, Helmholtz equation with application to boundary and initial-value problems in cylindrical and spherical coordinates. Prerequisite(s): MATH 5406 or permission of the School. Also offered at the undergraduate level, with different requirements, as MATH 4701, for which additional credit is precluded.

**MATH 5408 [0.5 credit] (MAT 5185)****Asymptotic Methods of Applied Mathematics**

Asymptotic series: properties, matching, application to differential equations. Asymptotic expansion of integrals: elementary methods, methods of Laplace, Stationary Phase and Steepest Descent, Watson's Lemma, Riemann-Lebesgue Lemma. Perturbation methods: regular and singular perturbation for differential equations, multiple scale analysis, boundary layer theory, WKB theory.

**MATH 5605 [0.5 credit] (MAT 5165)****Theory of Automata**

Algebraic structure of sequential machines, decomposition of machines; finite automata, formal languages; complexity.

Also offered at the undergraduate level, with different requirements, as MATH 4805/COMP 4805, for which additional credit is precluded.

**MATH 5607 [0.5 credit] (MAT 5324)****Game Theory**

Two-person zero-sum games; infinite games; multi-stage games; differential games; utility theory; two-person general-sum games; bargaining problem; n-person games; games with a continuum of players.

Also offered at the undergraduate level, with different requirements, as MATH 4807, for which additional credit is precluded.

**MATH 5609 [0.5 credit] (MAT 5301)****Topics in Combinatorial Mathematics**

Courses in special topics related to Combinatorial Mathematics, not covered by other graduate courses.

**MATH 5801 [0.5 credit] (MAT 5303)****Linear Optimization**

Linear programming problems; simplex method, upper bounded variables, free variables; duality; postoptimality analysis; linear programs having special structures; integer programming problems; unimodularity; knapsack problem.

**MATH 5803 [0.5 credit] (MAT 5304)****Nonlinear Optimization**

Methods for unconstrained and constrained optimization problems; Kuhn-Tucker conditions; penalty functions; duality; quadratic programming; geometric programming; separable programming; integer nonlinear programming; pseudo-Boolean programming; dynamic programming.

**MATH 5804 [0.5 credit] (MAT 5307)****Topics in Operations Research****MATH 5805 [0.5 credit] (MAT 5308)****Topics in Algorithm Design****MATH 5806 [0.5 credit] (MAT 5180)****Numerical Analysis**

Error analysis for fixed and floating point arithmetic; systems of linear equations; eigen-value problems; sparse matrices; interpolation and approximation, including Fourier approximation; numerical solution of ordinary and partial differential equations.

**MATH 5807 [0.5 credit] (MAT 5167)****Formal Language and Syntax Analysis**

Computability, unsolvable and NP-hard problems. Formal languages, classes of language automata. Principles of compiler design, syntax analysis, parsing (top-down, bottom-up), ambiguity, operator precedence, automatic construction of efficient parsers, LR, LR(O), LR(k), SLR, LL(k). Syntax directed translation.

Prerequisite(s): MATH 5605.

**MATH 5808 [0.5 credit] (MAT 5305)****Combinatorial Optimization I**

Network flow theory and related material. Topics will include shortest paths, minimum spanning trees, maximum flows, minimum cost flows. Optimal matching in bipartite graphs.

**MATH 5809 [0.5 credit] (MAT 5306)****Combinatorial Optimization II**

Topics include optimal matching in non-bipartite graphs, Euler tours, and the Chinese Postman problem. Other extensions of network flows: dynamic flows, multicommodity flows, and flows with gains, bottleneck problems. Matroid optimization. Enumerative and heuristic algorithms for the Traveling Salesman and other problems.

Prerequisite(s): MATH 5808 or permission of the school.

**MATH 5818 [0.5 credit] (MAT 5105)****Discrete Applied Mathematics I: Graph Theory**

Paths and cycles, trees, connectivity, Euler tours and Hamilton cycles, edge colouring, independent sets and cliques, vertex colouring, planar graphs, directed graphs. Selected topics from one or more of the following areas: algebraic graph theory, topological graph theory, random graphs.

**MATH 5819 [0.5 credit] (MAT 5107)**  
**Discrete Applied Mathematics II: Combinatorial Enumeration**

Ordinary and exponential generating functions, product formulas, permutations, rooted trees, cycle index, WZ method. Lagrange inversions, singularity analysis of generating functions and asymptotics. Selected topics from one or more of the following areas: random graphs, random combinatorial structures, hypergeometric functions.

**MATH 5821 [0.5 credit] (MAT 5341)**  
**Quantum Computing**

Space of quantum bits; entanglement. Observables in quantum mechanics. Density matrix and Schmidt decomposition. Quantum cryptography. Classical and quantum logic gates. Quantum Fourier transform. Shor's quantum algorithm for factorization of integers. Also offered at the undergraduate level, with different requirements, as MATH 4821, for which additional credit is precluded.

**MATH 5822 [0.5 credit] (MAT 5343)**  
**Mathematical Aspects of Wavelets and Digital Signal Processing**

Lossless compression methods. Discrete Fourier transform and Fourier-based compression methods. JPEG and MPEG. Wavelet analysis. Digital filters and discrete wavelet transform. Daubechies wavelets. Wavelet compression. Also offered at the undergraduate level, with different requirements, as MATH 4822, for which additional credit is precluded.

**MATH 5900 [0.5 credit] (MAT 5990)**  
**Seminar**

**MATH 5901 [0.5 credit] (MAT 5991)**  
**Directed Studies**

**MATH 5906 [0.5 credit] (MAT 5996)**  
**Research Internship**

This course affords students the opportunity to undertake research in mathematics as a cooperative project with governmental or industrial sponsors. The grade will be based upon the mathematical content and upon oral and written presentation of results. Includes: Experiential Learning Activity. Prerequisite(s): permission of the graduate director.

**MATH 5909 [2.0 credits] (MAT 7999)**  
**M.Sc. Thesis in Mathematics**  
Includes: Experiential Learning Activity

**MATH 5910 [1.0 credit] (MAT 6997)**  
**M.Sc. Project in Mathematics**

Project in mathematics supervised by a professor approved by the graduate director resulting in a major report (approximately 30-40 pages), together with a short presentation on the report. Graded by the supervisor and another professor appointed by the graduate director. Includes: Experiential Learning Activity. Precludes additional credit for MATH 5909.

**MATH 5993 [0.0 credit] (MAT 5993)**  
**Research Participation**  
Includes: Experiential Learning Activity

**MATH 6002 [0.5 credit] (MAT 5309)**  
**Harmonic Analysis on Groups**  
Transformation groups; Haar measure; unitary representations of locally compact groups; completeness and compact groups; character theory; decomposition.

**MATH 6008 [0.5 credit] (MAT 5326)**  
**Topics in Analysis**

**MATH 6101 [0.5 credit] (MAT 5327)**  
**Topics in Algebra**

**MATH 6104 [0.5 credit] (MAT 5158)**  
**Lie Groups**  
Matrix groups: one-parameter groups, exponential map, Campbell-Hausdorff formula, Lie algebra of a matrix group, integration on matrix groups. Abstract Lie groups. Prerequisite(s): MATH 5007 or permission of the School.

**MATH 6201 [0.5 credit] (MAT 5312)**  
**Topics in Topology**

**MATH 6507 [0.5 credit] (MAT 5319)**  
**Topics in Probability**

**MATH 6806 [0.5 credit] (MAT 5361)**  
**Topics in Mathematical Logic**

**MATH 6900 [0.5 credit] (MAT 6990)**  
**Seminar**

**MATH 6901 [0.5 credit] (MAT 6991)**  
**Directed Studies**

**MATH 6909 [0.0 credit] (MAT 9999)****Ph.D. Thesis**

Includes: Experiential Learning Activity

**Statistics (STAT) Courses****STAT 5501 [0.5 credit] (MAT 5191)****Mathematical Statistics II**

Confidence intervals and pivots; Bayesian intervals; optimal tests and Neyman-Pearson theory; likelihood ratio and score tests; significance tests; goodness-of-fit tests; large sample theory and applications to maximum likelihood and robust estimation.

Prerequisite(s): STAT 5600 or permission of the School.

Also offered at the undergraduate level, with different requirements, as STAT 4507, for which additional credit is precluded.

**STAT 5502 [0.5 credit] (MAT 5192)****Sampling Theory and Methods**

Unequal probability sampling with and without replacement; unified theory for standard errors; prediction approach; ratio and regression estimation; stratification and optimal designs; multistage cluster sampling; double sampling; domains of study; post-stratification; nonresponse; measurement errors; related topics.

**STAT 5503 [0.5 credit] (MAT 5193)****Linear Models**

Theory of non full rank linear models; estimable functions, best linear unbiased estimators, hypotheses testing, confidence regions; multi-way classifications; analysis of covariance; variance component models; maximum likelihood estimation, Minque, Anova methods; miscellaneous topics.

Prerequisite(s): STAT 5600 or permission of the School.

**STAT 5504 [0.5 credit] (MAT 5194)****Stochastic Processes and Time Series Analysis**

Stationary stochastic processes, inference for stochastic processes, applications to time series and spatial series analysis.

**STAT 5505 [0.5 credit] (MAT 5195)****Design of Experiments**

Overview of linear model theory; orthogonality; randomized block and split plot designs; latin square designs; randomization theory; incomplete block designs; factorial experiments: confounding and fractional replication; response surface methodology. Miscellaneous topics.

Prerequisite(s): STAT 5600 or permission of the School.

**STAT 5506 [0.5 credit] (MAT 5175)****Robust Statistical Inference**

Tests for location, scale, and regression parameters; derivation of rank tests; distribution theory of linear rank statistics and their efficiency. Robust estimation of location, scale and regression parameters; Huber's M-estimators, Rank-methods, L-estimators. Influence function. Adaptive procedures.

Prerequisite(s): STAT 5600 or permission of the School.

**STAT 5509 [0.5 credit] (MAT 5196)****Multivariate Analysis**

Multivariate methods of data analysis, including principal components, cluster analysis, factor analysis, canonical correlation, MANOVA, profile analysis, discriminant analysis, path analysis.

Prerequisite(s): STAT 5600 or permission of the School.

**STAT 5516 [0.5 credit]****Nonparametric Statistics**

Classical nonparametric techniques; nonparametric density estimation; nonparametric regression analysis: kernel estimators, orthogonal series estimators, smoothing splines; estimation of statistical functionals; nonparametric bootstrap; jackknife; elements of high dimensional statistical inference; multiple testing and false discovery. Statistical software will be used.

Prerequisite(s): STAT 5600 or permission of the School.

Also offered at the undergraduate level, with different requirements, as STAT 4506, for which additional credit is precluded.

Lectures three hours a week.

**STAT 5600 [0.5 credit] (MAT 5190)****Mathematical Statistics I**

Statistical decision theory; likelihood functions; sufficiency; factorization theorem; exponential families; UMVU estimators; Fisher's information; Cramer-Rao lower bound; maximum likelihood, moment estimation; invariant and robust point estimation; asymptotic properties; Bayesian point estimation.

Also offered at the undergraduate level, with different requirements, as STAT 4500, for which additional credit is precluded.

**STAT 5601 [0.5 credit] (MAT 5197)****Stochastic Optimization**

Topics chosen from stochastic dynamic programming, Markov decision processes, search theory, optimal stopping.

**STAT 5602 [0.5 credit] (MAT 5317)****Analysis of Categorical Data**

Analysis of one-way and two-way tables of nominal data; multi-dimensional contingency tables, log-linear models; tests of symmetry, marginal homogeneity in square tables; incomplete tables; tables with ordered categories; fixed margins, logistic models with binary response; measures of association and agreement.

Prerequisite(s): STAT 5600 and STAT 5501, or permission of the School.

**STAT 5603 [0.5 credit] (MAT 5318)****Reliability and Survival Analysis**

Types of censored data; nonparametric estimation of survival function; graphical procedures for model identification; parametric models and maximum likelihood estimation; exponential and Weibull regression models; nonparametric hazard function models and associated statistical inference; rank tests with censored data applications.

Prerequisite(s): STAT 5600 and STAT 5501 or permission of the School.

**STAT 5604 [0.5 credit] (MAT 5173)****Stochastic Analysis**

Brownian motion, continuous martingales, and stochastic integration.

Prerequisite(s): STAT 5708 or permission of the School.

**STAT 5610 [0.5 credit] (MAT 5375)****Introduction to Mathematical Statistics**

Limit theorems. Sampling distributions. Parametric estimation. Concepts of sufficiency and efficiency. Neyman-Pearson paradigm, likelihood ratio tests. Parametric and non-parametric methods for two-sample comparisons. Notions of experimental design, categorical data analysis, the general linear model, decision theory and Bayesian inference.

Precludes additional credit for STAT 5600.

Also offered at the undergraduate level, with different requirements, as STAT 4500, for which additional credit is precluded.

**STAT 5615 [0.5 credit]****Analysis of Longitudinal and Clustered Data**

Advanced course in models and methods for dependent data, an emphasis on non-normally distributed data.

Topics include linear and generalized linear mixed models, logistic model for binary data, log-linear model for count data, marginal vs. conditional models, generalized estimating equation, missing data.

Prerequisite(s): Knowledge of simple regression analysis.

**STAT 5701 [0.5 credit] (MAT 5198)****Stochastic Models**

Markov systems, stochastic networks, queuing networks, spatial processes, approximation methods in stochastic processes and queuing theory. Applications to the modeling and analysis of computer-communications systems and other distributed networks.

Also offered at the undergraduate level, with different requirements, as STAT 4508, for which additional credit is precluded.

**STAT 5702 [0.5 credit] (MAT 5182)****Modern Applied and Computational Statistics**

Resampling and computer intensive methods: bootstrap, jackknife with applications to bias estimation, variance estimation, confidence intervals, and regression analysis. Smoothing methods in curve estimation; statistical classification and pattern recognition: error counting methods, optimal classifiers, bootstrap estimates of the bias of the misclassification error.

**STAT 5703 [0.5 credit] (MAT 5181)****Data Mining**

Visualization and knowledge discovery in massive datasets; unsupervised learning: clustering algorithms; dimension reduction; supervised learning: pattern recognition, smoothing techniques, classification. Computer software will be used.

Includes: Experiential Learning Activity

Precludes additional credit for DATA 5001.

**STAT 5704 [0.5 credit] (MAT 5174)****Network Performance**

Advanced techniques in performance evaluation of large complex networks. Topics may include classical queueing theory and simulation analysis; models of packet networks; loss and delay systems; blocking probabilities.

**STAT 5705 [0.5 credit] (MAT 5373 )****Statistical Machine Learning**

Discriminant analysis, principal component analysis, support vector machines; reproducing kernel Hilbert spaces and kernel methods; neural networks; VC Theory, PAC learning. Additional topics may include: Bayesian modelling, manifold learning, boosting.

Includes: Experiential Learning Activity

**STAT 5708 [0.5 credit] (MAT 5170)****Probability Theory I**

Probability spaces, random variables, expected values as integrals, joint distributions, independence and product measures, cumulative distribution functions and extensions of probability measures, Borel-Cantelli lemmas, convergence concepts, independent identically distributed sequences of random variables.

**STAT 5709 [0.5 credit] (MAT 5171)****Probability Theory II**

Laws of large numbers, characteristic functions, central limit theorem, conditional probabilities and expectations, basic properties and convergence theorems for martingales, introduction to Brownian motion.

Prerequisite(s): STAT 5708 (MAT 5170) or permission of the School.

**STAT 5713 [0.5 credit]****Advanced Data Mining**

Topics from recent literature on mining complex data structures and data such as: tree/graph, sequence, web/test, stream, spatiotemporal, high-dimensional, multivariate time series, mixed-mode; clustering (EM, topic modeling, fuzzy), SVM; multi-label learning; deep learning; combining learners, network analysis/link prediction/graphical models (Bayesian, Markov networks); anomaly detection.

**STAT 5900 [0.5 credit] (MAT 5990)****Seminar****STAT 5901 [0.5 credit] (MAT 6991)****Directed Studies****STAT 5902 [0.5 credit] (MAT 5992)****Seminar in Biostatistics**

Students work in teams on the analysis of experimental data or experimental plans. The participation of experimenters in these teams is encouraged. Student teams present their results in the seminar, and prepare a brief written report on their work.

**STAT 5904 [0.5 credit] (MAT 5993)****Statistical Internship**

This project-oriented course allows students to undertake statistical research and data analysis projects as a cooperative project with governmental or industrial sponsors. Practical data analysis and consulting skills will be emphasized. The grade will be based upon oral and written presentation of results.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the graduate director.

**STAT 5909 [2.0 credits]****M.Sc. Thesis in Statistics****STAT 5910 [1.0 credit]****M.Sc. Project in Statistics**

Project in statistics supervised by a professor approved by the graduate director resulting in a major report (approximately 30-40 pages), together with a short presentation on the report. Graded by the supervisor and another professor appointed by the graduate director.

Includes: Experiential Learning Activity

**STAT 6508 [0.5 credit] (MAT 5314)****Topics in Probability and Statistics****STAT 6900 [0.5 credit] (MAT 6990)****Seminar****STAT 6901 [0.5 credit] (MAT 6991)****Directed Studies****STAT 6909 [0.0 credit] (MAT 9999)****Ph.D. Thesis**

Includes: Experiential Learning Activity

# Mechanical and Aerospace Engineering

This section presents the requirements for programs in:

- **M.A.Sc. Aerospace Engineering**
- **M.A.Sc. Materials Engineering**
- **M.A.Sc. Mechanical Engineering**
- **M.A.Sc. Aerospace Engineering with Collaborative Specialization in Climate Change**
- **M.A.Sc. Materials Engineering with Collaborative Specialization in Climate Change**
- **M.A.Sc. Mechanical Engineering with Collaborative Specialization in Climate Change**
- **M. Eng. Aerospace**
- **M. Eng. Materials**
- **M. Eng. Mechanical**
- **Ph.D. Aerospace Engineering**
- **Ph.D. Mechanical Engineering**

## Program Requirements

Students are expected to complete the master's program within the maximum limits outlined in the Section 13.2 of the General Regulations section of this Calendar.

### M.A.Sc. Aerospace Engineering (5.0 credits)

### M.A.Sc. Materials Engineering (5.0 credits)

### M.A.Sc. Mechanical Engineering (5.0 credits)

#### Requirements:

1. 2.5 credits in courses offered by the OCIMAE.	2.5
2. Participation in the Mechanical and Aerospace Engineering seminar series	
3. 2.5 credits in:	2.5
MECH 5909 [2.5] M.A.Sc. Thesis	
<b>Total Credits</b>	<b>5.0</b>

### M.A.Sc. Aerospace Engineering with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements:

1. 1.0 credit in:	1.0
CLIM 5000 [1.0] Climate Collaboration	
2. 0.0 credit in:	
CLIM 5800 [0.0] Climate Seminar Series	
3. 1.5 credits in courses offered by the OCIMAE.	1.5
4. Participation in the Mechanical and Aerospace Engineering seminar series	
5. 2.5 credits in:	2.5
MECH 5909 [2.5] M.A.Sc. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

### M.A.Sc. Materials Engineering with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements:

1. 1.0 credit in:	1.0
CLIM 5000 [1.0] Climate Collaboration	

2. 0.0 credit in:	
CLIM 5800 [0.0] Climate Seminar Series	
3. 1.5 credits in courses offered by the OCIMAE.	1.5
4. Participation in the Mechanical and Aerospace Engineering seminar series	
5. 2.5 credits in:	2.5
MECH 5909 [2.5] M.A.Sc. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

### M.A.Sc. Mechanical Engineering with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements:

1. 1.0 credit in:	1.0
CLIM 5000 [1.0] Climate Collaboration	
2. 0.0 credit in:	
CLIM 5800 [0.0] Climate Seminar Series	
3. 1.5 credits in courses offered by the OCIMAE.	1.5
4. Participation in the Mechanical and Aerospace Engineering seminar series	
5. 2.5 credits in:	2.5
MECH 5909 [2.5] M.A.Sc. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

### M. Eng. Aerospace (5.0 credits)

#### Requirements:

1. 1.5 credits from the Aerospace Engineering Courses listed below. Up to 1.0 credit can be completed by taking courses in AERO at the 4000 level with the approval of the Associate Chair for Graduate Studies.	1.5
2. 3.5 credits from any graduate level course offered by the OCIMAE	3.5
<b>Total Credits</b>	<b>5.0</b>

#### Requirements by Project (Independent Study) (5.0 credits)

1. 1.5 credits in:	1.5
MECH 5908 [1.5] Independent Engineering Study	
2. 1.5 credits from the Aerospace Engineering Courses listed below. Up to 1.0 credit can be completed by taking courses in AERO at the 4000 level and MAAE at the 4000 level with the approval of the Associate Chair for Graduate Studies.	1.5
3. 2.0 credits from any graduate level course offered by the OCIMAE	2.0
<b>Total Credits</b>	<b>5.0</b>

### M. Eng. Materials (5.0 credits)

#### Requirements:

1. 1.5 credits from the Materials Engineering Courses listed below. Up to 1.0 credit can be completed by taking courses in materials oriented MECH at the 4000 level and MAAE at the 4000 level with the approval of the Associate Chair for Graduate Studies.	1.5
2. 3.5 credits from any graduate level course offered by the OCIMAE	3.5
<b>Total Credits</b>	<b>5.0</b>

#### Requirements by Project (Independent Study) (5.0 credits)

<b>1. 1.5 credits in:</b>	1.5
MECH 5908 [1.5] Independent Engineering Study	
<b>2. 1.5 credits from</b> the Materials Engineering Courses listed below. Up to 1.0 credit can be completed by taking courses in materials oriented MECH at the 4000 level and MAAE at the 4000 level with the approval of the Associate Chair for Graduate Studies.	1.5
<b>3. 2.0 credits from</b> any graduate level course offered by the OCIMAE	2.0
<b>Total Credits</b>	<b>5.0</b>

### M. Eng. Mechanical (5.0 credits)

#### Requirements:

<b>1. 5.0 credits from</b> any graduate level course offered by the OCIMAE. Up to 1.0 credit can be completed by taking courses in MECH at the 4000 level and MAAE at the 4000 with the approval of the Associate Chair for Graduate Studies.	5.0
<b>Total Credits</b>	<b>5.0</b>

#### Requirements by Project (Independent Study) (5.0 credits)

<b>1. 1.5 credits in:</b>	1.5
MECH 5908 [1.5] Independent Engineering Study	
<b>2. 3.5 credits from</b> any graduate level course offered by the OCIMAE. Up to 1.0 credit can be completed by taking courses in MECH at the 4000 level and MAAE at the 4000 level with the approval of the Associate Chair for Graduate Studies.	3.5
<b>Total Credits</b>	<b>5.0</b>

### Ph.D. Aerospace Engineering (1.5 credits)

### Ph.D. Mechanical Engineering (1.5 credits)

#### Requirements (from the master's degree):

(from the master's degree)

<b>1. 1.5 credits in</b> courses	1.5
<b>2. Participation in the Mechanical and Aerospace Engineering seminar series</b>	
<b>3. Successful completion of the comprehensive examination according to section 9.4 and 9.5 of the General Regulations section of this Calendar</b>	
<b>4. 0.0 credits in</b> thesis.	0.0
MECH 6909 [0.0] Ph.D. Thesis	
<b>Total Credits</b>	<b>1.5</b>

#### Graduate Courses

In addition, graduate courses offered by departments in other disciplines may be taken for credit with approval by the department in which the student is registered.

The full list of MECH and MAAJ courses can be found in the course inventory tab. Not all of the following courses are offered in a given year.

The following codes identify the department offering the course:

- 'MECH' Department of Mechanical and Aerospace Engineering, Carleton University
- 'MAAJ' Department of Mechanical Engineering, University of Ottawa

#### CARLETON UNIVERSITY

#### Aerospace Engineering Courses

MECH 5005 (MCG 5305)	Uninhabited Aircraft Systems Design
MECH 5101 (MCG 5311)	Dynamics and Aerodynamics of Flight
MECH 5103 (MCG 5328)	3D Machine Vision: From Robots to the Space Station
MECH 5105 (MCG 5315)	Orbital Mechanics and Space Control
MECH 5106 (MCG 5121)	Space Mission Analysis and Design
MECH 5301 (MCG 5331)	Aeroacoustics

#### Materials Engineering Courses

MECH 5604 (AMM 5364)	Computational Metallurgy
MECH 5609 (AMM 5123)	Microstructure and Properties of Materials
MECH 5700 (AMM 5345)	Surfaces and Coatings
MECH 5701 (AMM 5369)	Metallic Phases and Transformations

#### With the approval of the Department, the following courses can be placed in one of the above categories:

MECH 5800 (MCG 5480)	Special Topics in Mechanical and Aerospace Engineering
MECH 5801 (MCG 5489)	Special Topics in Mechanical and Aerospace Engineering
MECH 5802 (MCG 5483)	Special Topics in Mechanical and Aerospace Engineering
MECH 5803 (MCG 5488)	Special Topics in Mechanical and Aerospace Engineering
MECH 5804 (MCG 5384)	Special Topics in Mechanical and Aerospace Engineering
MECH 5805 (MCG 5482)	Special Topics in Mechanical and Aerospace Engineering
MECH 5806 (MCG 5486)	Special Topics in Mechanical and Aerospace Engineering
MECH 5807 (MCG 5487)	Special Topics in Mechanical and Aerospace Engineering
MECH 5808 (MCG 5376)	Special Topics in Mechanical and Aerospace Engineering
MECH 5809 (MCG 5382)	Special Topics in Mechanical and Aerospace Engineering

#### UNIVERSITY OF OTTAWA

#### Aerospace Engineering Courses

MAAJ 5010 (MCG 5310)	Performance and Economics of V/ Stol Aircraft
MAAJ 5031 (MCG 5331)	Aero-Acoustics
MAAJ 5053 (AMM 5124)	Fatigue and Damage Tolerance in Aircraft
MAAJ 5157 (MCG 5121)	Space Mission Analysis and Design

#### Materials Engineering Courses

MAAJ 5003 (MCG 5103)	Theory Perfectly Plastic Solid
MAAJ 5012 (AMM 5364)	Computational Metallurgy
MAAJ 5052 (AMM 5122)	Failure Analysis of High-Temperature Protective Coatings for Aerospace Applications

MAAJ 5100 (MCG 5110)	Micromechanics of Solids
MAAJ 5107 (AMM 5117)	Intro to Composite Materials
MAAJ 5108 (AMM 5118)	Introduction to Plasticity
MAAJ 5206 (AMM 5126)	Deformation of Materials
MAAJ 5209 (AMM 5129)	Hot Working of Metals
MAAJ 5307 (AMM 5137)	Special Studies in Solid Mechanics and Materials
MAAJ 5452 (AMM 5144)	Superalloys and Ceramix-Metal Matrix Composites
MAAJ 5659 (AMM 5123)	Microstructure and Properties of Materials
MAAJ 5750 (AMM 5345)	Surfaces and Coatings
MAAJ 5751 (AMM 5369)	Metallic Phases and Transformations
<b>With the approval of the Department, the following courses can be placed in one of the above categories:</b>	
MAAJ 5011 (AMM 5138)	Advanced Topics in Advanced Materials and Manufacturing
MAAJ 5308 (MCG 5138)	Advanced Topics in Mechanical Engineering
MAAJ 5310	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5311 (MCG 5471)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5312 (MCG 5472)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5313 (MCG 5473)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5314 (MCG 5474)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5315 (MCG 5475)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5316 (MCG 5476)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5317 (MCG 5477)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5318 (MCG 5478)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5319 (MCG 5479)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5402 (MCG 5370)	Special Topics in Mechanical and Aeronautical Engineering
MAAJ 5403 (MCG 5470)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5852 (MCG 5483)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5853 (MCG 5488)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5854 (MCG 5384)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5855 (MCG 5482)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5857 (MCG 5487)	Special Topics in Mechanical and Aerospace Engineering
MAAJ 5858 (MCG 5376)	Special Topics in Mechanical and Aerospace Engineering

MAAJ 5850 (MCG 5480)	Special Topics in Mechanical and Aerospace Engineering
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## Regulations

See the General Regulations section of this Calendar.

## Regularly Scheduled Break

For immigration purposes in the programs listed below, the summer term (May to August) is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

- M.Eng. Aerospace (coursework and research project pathways only)
- M.Eng. Materials (coursework and research project pathways only)
- M.Eng. Mechanical (coursework and research project pathways only)

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## Admission

The normal requirement for admission to the master's program is a bachelor's degree with at least high honours standing in mechanical or aerospace engineering or a related discipline.

## Admission

The normal requirement for admission to the Ph.D. program is a master's degree in mechanical or aerospace engineering or a related discipline.

Students who are in the master's program may be admitted to the Ph.D. program if they show outstanding academic performance and demonstrate significant promise for advanced research, upon recommendation of the department. In addition, graduate courses offered by departments in other disciplines may be taken for credit with approval by the department in which the student is registered.

## Mechanical and Aerospace Engineering (Joint) (MAAJ) Courses

**MAAJ 5001 [0.5 credit] (AMM 5101)**  
**Theory of Elasticity**

**MAAJ 5002 [0.5 credit] (AMM 5102)**  
**Advanced Stress Analysis**

**MAAJ 5003 [0.5 credit] (AMM 5103)**  
**Theory Perfectly Plastic Solid**

**MAAJ 5004 [0.5 credit] (MCG 5104)**  
**Theory of Plates and Shells**

**MAAJ 5005 [0.5 credit] (MCG 5105)**  
**Continuum Mechanics**

**MAAJ 5006 [0.5 credit] (AMM 5106)**  
**Advanced Topics in Elasticity**

**MAAJ 5007 [0.5 credit] (MCG 5107)**  
**Adv. Dynamics w/Applications**

**MAAJ 5008 [0.5 credit] (MCG 5108)**  
**Finite Element Analysis**

**MAAJ 5009 [0.5 credit] (MCG 5109)**  
**Advanced Topics in Finite Element Analysis**

**MAAJ 5010 [0.5 credit] (MCG 5310)**  
**Performance and Economics of V/Stol Aircraft**

**MAAJ 5011 [0.5 credit] (AMM 5138)**  
**Advanced Topics in Advanced Materials and Manufacturing**

**MAAJ 5012 [0.5 credit] (AMM 5364)**  
**Computational Metallurgy**

**MAAJ 5013 [0.5 credit] (MCG 5125)**  
**Advanced Dynamics**

**MAAJ 5014 [0.5 credit] (MCG 5314)**  
**Ground Transportation Systems and Vehicles**

**MAAJ 5015 [0.5 credit] (MCG 5120)**  
**Micro and Nano Systems**

**MAAJ 5021 [0.5 credit] (MCG 5321)**  
**Methods of Energy Conversion**

**MAAJ 5022 [0.5 credit] (MCG 5322)**  
**Nuclear Engineering**

**MAAJ 5025 [0.5 credit] (MCG 5325)**  
**Wind Engineering**

**MAAJ 5026 [0.5 credit] (MCG 5326)**  
**System Modelling, Dynamics and Control**

**MAAJ 5027 [0.5 credit] (MCG 5327)**  
**Nonlinear System Analysis and Controls**

**MAAJ 5028 [0.5 credit] (MCG 5328)**  
**3D Machine Vision: From Robots to the Space Station**

**MAAJ 5030 [0.5 credit] (MCG 5330)**  
**Engineering Acoustics**

**MAAJ 5031 [0.5 credit] (MCG 5331)**  
**Aero-Acoustics**

**MAAJ 5042 [0.5 credit] (MCG 5342)**  
**Gas Turbines**

**MAAJ 5048 [0.5 credit] (MCG 5348)**  
**Convective Heat and Mass Transfers**

**MAAJ 5050 [0.5 credit] (MCG 5300)**  
**Fundamentals of Fluid Dynamics**  
Also listed as MECH 5000.

**MAAJ 5051 [0.5 credit] (AMM 5130)**  
**Deformation and Fracture of Engineering Materials**

**MAAJ 5052 [0.5 credit] (AMM 5122)**  
**Failure Analysis of High-Temperature Protective Coatings for Aerospace Applications**

**MAAJ 5053 [0.5 credit] (AMM 5124)**  
**Fatigue and Damage Tolerance in Aircraft**

**MAAJ 5054 [0.5 credit] (MCG 5147)**  
**Finite-Volume Methods for Compressible Flows**

**MAAJ 5055 [0.5 credit] (MCG 5148)**  
**High-Performance Parallel Scientific Computing**

**MAAJ 5056 [0.5 credit] (AMM 5125)**  
**Materials Characterization Techniques**

**MAAJ 5057 [0.5 credit] (AMM 5121)**  
**Materials Selection in Engineering Design**

**MAAJ 5058 [0.5 credit] (MCG 5149)**  
**Non-Equilibrium Gas Dynamics**

**MAAJ 5059 [0.5 credit] (MCG 5309)**  
**Environmental Fluid Mechanics**  
Includes: Experiential Learning Activity  
Also listed as MECH 5009.

**MAAJ 5100 [0.5 credit] (MCG 5110)**  
**Micromechanics of Solids**

**MAAJ 5101 [0.5 credit] (MCG 5111)**  
**Gas Dynamics**

**MAAJ 5102 [0.5 credit] (AMM 5317)**  
**Experimental Stress Analysis**

**MAAJ 5103 [0.5 credit] (AMM 5374)**  
**Integrated Manufacturing - CIMS**

**MAAJ 5105 [0.5 credit] (MCG 5115)**  
**Non-Linear Optimization**

**MAAJ 5107 [0.5 credit] (AMM 5117)**  
**Intro to Composite Materials**  
Includes: Experiential Learning Activity

**MAAJ 5108 [0.5 credit] (AMM 5118)**  
**Introduction to Plasticity**

**MAAJ 5109 [0.5 credit] (AMM 5119)**  
**Fracture Mechanics**

**MAAJ 5122 [0.5 credit] (MCG 5352)**  
**Optimal Control Systems**

**MAAJ 5123 [0.5 credit] (MCG 5353)**  
**Robotics**

**MAAJ 5151 [0.5 credit] (MCG 5311)**  
**Dynamics and Aerodynamics of Flight**  
Includes: Experiential Learning Activity  
Also listed as MECH 5101.

**MAAJ 5152 [0.5 credit] (MCG 5301)**  
**Theory of Viscous Flows**

**MAAJ 5153 [0.5 credit] (MCG 5303)**  
**Incompressible Non-Viscous Flows**

**MAAJ 5154 [0.5 credit] (MCG 5304)**  
**Compressible Non-Viscous Flows**

**MAAJ 5155 [0.5 credit] (MCG 5315)**  
**Orbital Mechanics and Space Control**  
Includes: Experiential Learning Activity  
Also listed as MECH 5105.

**MAAJ 5156 [0.5 credit] (AMM 5381)**  
**Lightweight Structures**

**MAAJ 5157 [0.5 credit] (MCG 5121)**  
**Space Mission Analysis and Design**

**MAAJ 5158 [0.5 credit] (MCG 5308)**  
**Experimental Methods in Fluid Mechanics**

**MAAJ 5159 [0.5 credit] (MCG 5122)**  
**Smart Structures**

**MAAJ 5206 [0.5 credit] (AMM 5126)**  
**Deformation of Materials**

**MAAJ 5209 [0.5 credit] (AMM 5129)**  
**Hot Working of Metals**

**MAAJ 5251 [0.5 credit] (MCG 5354)**  
**Guidance, Navigation and Control**

**MAAJ 5252 [0.5 credit] (MCG 5356)**  
**Neuro and Fuzzy Control**

**MAAJ 5253 [0.5 credit] (MCG 5366)**  
**Finite Element Analysis II**

**MAAJ 5254 [0.5 credit] (MCG 5483)**  
**Fundamentals of Combustion**  
Also listed as MECH 5204.

**MAAJ 5255 [0.5 credit] (MCG 5324)**  
**Building Performance Simulation**  
Includes: Experiential Learning Activity  
Also listed as MECH 5205.

**MAAJ 5301 [0.5 credit] (MCG 5131)**  
**Heat Transfer by Conduction**

**MAAJ 5302 [0.5 credit] (MCG 5132)**  
**Heat Transfer by Convection**

**MAAJ 5303 [0.5 credit] (MCG 5133)**  
Heat Transfer by Radiation

**MAAJ 5304 [0.5 credit] (MCG 5134)**  
Heat Transfer w/Phase Change

**MAAJ 5305 [0.5 credit] (MCG 5343)**  
Advanced Thermodynamics

**MAAJ 5306 [0.5 credit] (MCG 5136)**  
Special Studies in Fluid Mech and Heat Transfer

**MAAJ 5307 [0.5 credit] (AMM 5137)**  
Special Studies in Solid Mechanics and Materials

**MAAJ 5308 [0.5 credit] (MCG 5138)**  
Advanced Topics in Mechanical Engineering

**MAAJ 5309 [0.5 credit] (MCG 5375)**  
CAD/CAM

**MAAJ 5311 [0.5 credit] (MCG 5471)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5312 [0.5 credit] (MCG 5472)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5313 [0.5 credit] (MCG 5473)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5314 [0.5 credit] (MCG 5474)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5315 [0.5 credit] (MCG 5475)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5316 [0.5 credit] (MCG 5476)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5317 [0.5 credit] (MCG 5477)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5318 [0.5 credit] (MCG 5478)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5319 [0.5 credit] (MCG 5479)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5340 [0.5 credit] (MCG 5344)**  
Gas Turbine Combustion

**MAAJ 5352 [0.5 credit] (MCG 5332)**  
Instrumentation Techniques  
Also listed as MECH 5302.

**MAAJ 5354 [0.5 credit] (MCG 5334)**  
Computational Fluid Dynamics of Compressible Flow  
Also listed as MECH 5304.

**MAAJ 5356 [0.5 credit] (MCG 5306)**  
Theory of Subsonic Flows

**MAAJ 5357 [0.5 credit] (MCG 5307)**  
Theory of Supersonic Flows

**MAAJ 5401 [0.5 credit] (MCG 5141)**  
Statistical Thermodynamics

**MAAJ 5402 [0.5 credit] (MCG 5370)**  
Special Topics in Mechanical and Aeronautical Engineering

**MAAJ 5403 [0.5 credit] (MCG 5470)**  
Special Topics in Mechanical and Aerospace Engineering

**MAAJ 5408 [0.5 credit] (MCG 5551)**  
Theorie d'Ecoulement Visqueux

**MAAJ 5409 [0.5 credit] (MCG 5552)**  
Theorie de Turbulence

**MAAJ 5451 [0.5 credit] (MCG 5341)**  
Turbomachinery  
Includes: Experiential Learning Activity  
Also listed as MECH 5401.

**MAAJ 5452 [0.5 credit] (AMM 5144)**  
Superalloys and Ceramix-Metal Matrix Composites

**MAAJ 5457 [0.5 credit] (MCG 5347)**  
**Conductive and Radiative Heat Transfer**  
Also listed as MECH 5407.

**MAAJ 5459 [0.5 credit] (MCG 5349)**  
**Two-Phase Flow and Heat Transfer**

**MAAJ 5500 [0.5 credit] (MCG 5557)**  
**Méthodes numériques en mécanique**

**MAAJ 5501 [0.5 credit] (MCG 5151)**  
**Laminar Flow Theory**

**MAAJ 5502 [0.5 credit] (MCG 5152)**  
**Theory of Turbulence**

**MAAJ 5505 [0.5 credit] (MCG 5155)**  
**Inviscid Flow Theory**

**MAAJ 5506 [0.5 credit] (MCG 5156)**  
**Measurement of Fluid Mech**

**MAAJ 5507 [0.5 credit] (MCG 5157)**  
**Num Comp:Fluid Dyn and Heat Tran**

**MAAJ 5509 [0.5 credit] (AMM 5159)**  
**Advanced Production Planning and Control**

**MAAJ 5550 [0.5 credit] (MCG 5350)**  
**Advanced Vibration Analysis**  
Includes: Experiential Learning Activity  
Also listed as MECH 5500.

**MAAJ 5555 [0.5 credit] (MCG 5355)**  
**Stability Theory & Application**  
Also listed as MECH 5505.

**MAAJ 5557 [0.5 credit] (MCG 5124)**  
**Advanced Kinematics**  
Includes: Experiential Learning Activity  
Also listed as MECH 5507.

**MAAJ 5607 [0.5 credit] (MCG 5167)**  
**Nuclear Reactor Engineering**

**MAAJ 5608 [0.5 credit] (AMM 5168)**  
**Industrial Organization**

**MAAJ 5609 [0.5 credit] (MCG 5169)**  
**Advanced Topics in Reliability Engineer**

**MAAJ 5652 [0.5 credit] (AMM 5362)**  
**Failure Prevention**

**MAAJ 5655 [0.5 credit] (MCG 5365)**  
**Finite Element Analysis I**  
Also listed as MECH 5605.

**MAAJ 5656 [0.5 credit] (MCG 5367)**  
**The Boundary Element Method**  
Includes: Experiential Learning Activity  
Also listed as MECH 5607.

**MAAJ 5657 [0.5 credit] (MCG 5361)**  
**Creative Problem Solving and Design**  
Also listed as MECH 5601.

**MAAJ 5659 [0.5 credit] (AMM 5123)**  
**Microstructure and Properties of Materials**  
Also listed as MECH 5609.

**MAAJ 5700 [0.5 credit] (MCG 5170)**  
**Computer-Aided Design**  
Includes: Experiential Learning Activity

**MAAJ 5701 [0.5 credit] (MCG 5171)**  
**Applied Reliability Theory**

**MAAJ 5703 [0.5 credit] (MCG 5173)**  
**Systems Engineer and Integration**

**MAAJ 5707 [0.5 credit] (MCG 5177)**  
**Robot Mechanics**

**MAAJ 5709 [0.5 credit] (AMM 5179)**  
**Manufacturing System Analysis**

**MAAJ 5750 [0.5 credit] (AMM 5345)**  
**Surfaces and Coatings**  
Also listed as MECH 5700.

**MAAJ 5751 [0.5 credit] (AMM 5369)**  
**Metallic Phases and Transformations**  
Precludes additional credit for MECH 5701.

**MAAJ 5802 [0.5 credit] (AMM 5182)**  
**Theory of Elastic Instability**

**MAAJ 5804 [0.5 credit] (MCG 5184)**  
**Mechatronics**

**MAAJ 5805 [0.5 credit] (MCG 5185)**  
**Multivariable Digital Control**

**MAAJ 5806 [0.5 credit] (MCG 5186)**  
**Non-Linear Disc Dyn and Control**

**MAAJ 5850 [0.5 credit] (MCG 5480)**  
**Special Topics in Mechanical and Aerospace Engineering**  
Also listed as MECH 5800.

**MAAJ 5851 [0.5 credit] (MCG 5380)**  
**Safety and Risk Assessment of Nuclear Power**

**MAAJ 5852 [0.5 credit] (MCG 5483)**  
**Special Topics in Mechanical and Aerospace Engineering**  
Also listed as MECH 5802.

**MAAJ 5853 [0.5 credit] (MCG 5488)**  
**Special Topics in Mechanical and Aerospace Engineering**  
Also listed as MECH 5803.

**MAAJ 5854 [0.5 credit] (MCG 5384)**  
**Special Topics in Mechanical and Aerospace Engineering**  
Also listed as MECH 5804.

**MAAJ 5855 [0.5 credit] (MCG 5482)**  
**Special Topics in Mechanical and Aerospace Engineering**  
Also listed as MECH 5805.

**MAAJ 5857 [0.5 credit] (MCG 5487)**  
**Special Topics in Mechanical and Aerospace Engineering**  
Also listed as MECH 5807.

**MAAJ 5858 [0.5 credit] (MCG 5376)**  
**Special Topics in Mechanical and Aerospace Engineering**  
Also listed as MECH 5808.

**MAAJ 5901 [0.5 credit] (MCG 5191)**  
**Combustion in Premixed Systems**

**MAAJ 5902 [0.5 credit] (MCG 5192)**  
**Combustion in Diffusion System**

## **Mechanical Engineering (MECH) Courses**

**MECH 5000 [0.5 credit] (MCG 5300)**

### **Fundamentals of Fluid Dynamics**

Equations of fluid motion: Navier-Stokes and Euler's equations. 2D and 3D irrotational flows: potential and stream functions; superposition; numerical modelling; Boundary- and free-shear layers: laminar, transitioning and turbulent states. RANS turbulence models. Self-similarity, momentum-integral and numerical modelling of thin shear layers.

Also listed as MAAJ 5050.

**MECH 5001 [0.5 credit] (MCG 5301)**

### **Theory of Viscous Flows**

Navier-Stokes and boundary layer equations; mean flow equations for turbulent kinetic energy; integral formulations. Stability, transition, turbulence, Reynolds stresses; separation. Calculation methods, closure schemes. Compressibility, heat transfer, and three-dimensional effects.

Includes: Experiential Learning Activity

**MECH 5003 [0.5 credit] (MCG 5303)**

### **Incompressible Non-Viscous Flow**

The fundamental equations and theorems for non-viscous fluid flow; solution of two-dimensional and axisymmetric potential flows; low-speed airfoil and cascade theory; wing lifting-line theory; panel methods.

**MECH 5004 [0.5 credit] (MCG 5304)**

### **Compressible Non-Viscous Flow**

Steady isentropic, frictional, and diabatic flow; shock waves; irrotational compressible flow, small perturbation theory and similarity rules; second-order theory and unsteady, one-dimensional flow.

**MECH 5005 [0.5 credit] (MCG 5305)**

### **Uninhabited Aircraft Systems Design**

UAS design, operations, and mission analysis; operational challenges; theory of flight and vehicle performance; regulations and safety; human factors and system integration; system-level reliability and life cycle assessment; payload and sensor analysis.

Includes: Experiential Learning Activity

**MECH 5006 [0.5 credit]****Solar Energy**

This course will take an in-depth look at solar radiation fundamentals, solar collector design and performance, heat transfer characteristics of solar collectors, energy storage, passive and active thermal systems, photovoltaics and applications of solar energy for collection and utilization.

**MECH 5008 [0.5 credit] (MCG 5308)****Experimental Methods in Fluid Mechanics**

Fundamentals of techniques of simulation of fluid dynamic phenomena. Theoretical basis, principles of design, performance and instrumentation of ground test facilities. Applications to aerodynamic testing.

Includes: Experiential Learning Activity

**MECH 5009 [0.5 credit] (MCG 5309)****Environmental Fluid Mechanics Relating to Energy Utilization**

Characteristics of energy sources and emissions into the environment. The atmosphere; stratification and stability, equations of motion, simple winds, mean flow, turbulence structure and dispersion near the ground. Flow and dispersion in groundwater, rivers, lakes and oceans. Physical and analytical modeling of environmental flows.

Includes: Experiential Learning Activity

Also listed as MAAJ 5059.

**MECH 5101 [0.5 credit] (MCG 5311)****Dynamics and Aerodynamics of Flight**

Aircraft nonlinear equations of motion and their linearization; effect of stability and control derivatives on the open-loop dynamics response; autopilot design and aircraft stability and control augmentation; pilot-in-the-loop; aeroelastic effects on stability and control.

Includes: Experiential Learning Activity

Also listed as MAAJ 5151.

**MECH 5103 [0.5 credit] (MCG 5328)****3D Machine Vision: From Robots to the Space Station**

Through lectures and project work, this course introduces fundamental 3D machine vision methods (triangulation and time-of-flight), presents cutting-edge neural network approaches, and explores major engineering applications (e.g. robotics, autonomous vehicles, space navigation) where perception of the 3D environment is essential.

**MECH 5105 [0.5 credit] (MCG 5315)****Orbital Mechanics and Space Control**

Orbital dynamics and perturbations due to the Earth's figure, the sun, and the moon with emphasis on mission planning and analysis. Rigid body dynamics applied to transfer orbit and on-orbit momentum management and control of spacecraft. Effects of flexible structures on a spacecraft control system.

Includes: Experiential Learning Activity

Also listed as MAAJ 5155.

**MECH 5106 [0.5 credit] (MCG 5121)****Space Mission Analysis and Design**

Review of solar system and space exploration. Space mission design and geometry. Analysis of orbit design, transfers, interplanetary trajectories. Effect of environment on spacecraft design. Space propulsion and launch vehicle design. Launch sequence, windows, cost.

Reusable launch systems.

**MECH 5107 [0.5 credit] (AMM 5317)****Experimental Stress Analysis**

Introduction to theory of elasticity. Photo-elasticity: types of polariscopes, two- and three-dimensional stress fields, frozen patterns. Photoelastic coatings. Strain gauges; gauge factors, sensitivity, calibration, and temperature compensation. Moire fringes, brittle lacquers, mechanical strain gauges.

**MECH 5108 [0.5 credit] (MCG 5329)****Space Robotics**

This course covers the full spectrum of manipulator robotics applied to in-orbit servicing, repair of spacecraft and removal of orbital debris as the first step towards developing a space infrastructure. It covers space manipulator missions, kinematics, dynamics, trajectory generation, control systems, and some special topics.

**MECH 5201 [0.5 credit] (MCG 5321)****Methods of Energy Conversion**

Technical, economic and environmental aspects of present and proposed large-scale systems of energy conversion.

**MECH 5202 [0.5 credit] (MCG 5122)****Smart Structures**

An introduction to the fundamentals of smart materials and structures: mechanisms and classification of the smart materials; their fundamental characteristics and operating principals; sensors and actuators design; design framework of smart structures; control experimentation of smart structures; application case studies.

**MECH 5203 [0.5 credit] (MCG 5322)****Nuclear Engineering**

Reactor design and safety requirement overview; reactor physics, chemistry and engineering, CANDU reactor design and operation; CANDU reactor fuel channels, thermalhydraulics and fuel; reactor safety design and analysis; IAEA and Canadian safety analysis requirements; reactor accidents; nuclear energy policy.

**MECH 5204 [0.5 credit] (MCG 5483)****Fundamentals of Combustion**

Emphasis on gas phase reacting flows. Background of combustion thermodynamics, diffusion mass transfer, and chemical kinetics. Detonations and deflagrations. Chemical and dynamic structure of flames. Gaseous flame propagation under laminar and turbulent conditions. Flame stabilization and extinction. Introduction to burning rate theory.

Also listed as MAAJ 5254.

**MECH 5205 [0.5 credit] (MCG 5324)****Building Performance Simulation**

During this course students will develop an understanding of the methodologies and theory employed historically and contemporarily in the Building Performance Simulation (BPS) field, develop capabilities for extending the functionality of BPS tools, and establish skills in applying BPS tools in research, analysis, and design.

Includes: Experiential Learning Activity

Also listed as MAAJ 5255.

**MECH 5206 [0.5 credit] (MCG 5325)****Wind Engineering**

Theoretical and practical areas pertinent to the operation of wind turbines. World energy needs, wind farms versus traditional power plants, global wind characteristics, efficient turbine design, electrical components, modes of turbine operation and control, mechanical design, economic and environmental concerns.

**MECH 5300 [0.5 credit] (MCG 5330)****Engineering Acoustics**

Review of acoustic waves in compressible fluids; acoustic pressure, intensity and impedance; physical interpretation and measurement; transmission through media; layers, in-homogeneous media, solids; acoustic systems; rooms, ducts, resonators, mufflers, properties of transducers; microphones, loudspeakers, computational acoustics.

**MECH 5301 [0.5 credit] (MCG 5331)****Aeroacoustics**

The convected wave equation; theory of subsonic and supersonic jet noise; propeller and helicopter noise; fan and compressor noise; boundary layer noise, interior noise; propagation in the atmosphere; sonic boom; impact on environment.

Includes: Experiential Learning Activity

**MECH 5302 [0.5 credit] (MCG 5332)****Instrumentation Techniques**

An introduction for the non-specialists to the concepts of digital and analog electronics with emphasis on data acquisition, processing and analysis. Topics covered include operational amplifiers, signal processing, digital logic systems, computer interfacing, noise in electronic systems. Hands-on sessions illustrate theory and practice.

Also listed as MAAJ 5352.

**MECH 5304 [0.5 credit] (MCG 5334)****Computational Fluid Dynamics of Compressible Flows**

Solution techniques for parabolic, elliptic and hyperbolic equations developed for problems of interest to fluid dynamics with appropriate stability considerations. A staged approach to solution of full Euler and Navier-Stokes equations is used. Grid generation techniques appropriate for compressible flows are introduced.

Also listed as MAAJ 5354.

**MECH 5400 [0.5 credit] (MCG 5344)****Gas Turbine Combustion**

Combustion fundamentals and gas turbine combustor design. Combustion fundamentals include fuel evaporation, chemistry of combustion, chemical kinetics and emissions formation and introduction to computational combustion modelling. Combustor design addresses the interrelationship between operational requirements and combustion fundamentals.

Precludes additional credit for MECH 5800 (MCG 5480) when MECH 5800 was offered with this topic.

**MECH 5401 [0.5 credit] (MCG 5341)****Turbomachinery**

Types of machines. Similarity: performance parameters; characteristics; cavitation. Velocity triangles. Euler equation: impulse and reaction. Radial pumps and compressors: analysis, design and operation. Axial pumps and compressors: cascade and blade-element methods; staging; off-design performance; stall and surge. Axial turbines. Current design practice.

Includes: Experiential Learning Activity

Also listed as MAAJ 5451.

**MECH 5402 [0.5 credit] (MCG 5342)****Gas Turbines**

Interrelationship among thermodynamic, aerodynamic, and mechanical design. Ideal and real cycle calculations. Cycle optimization; turbo-shaft, turbojet, turbofan. Component performance. Off-design performance; matching of compressor, turbine, nozzle. Twin-spool matching.

**MECH 5403 [0.5 credit] (MCG 5343)****Advanced Thermodynamics**

The course covers three major topics: review of fundamentals from a consistent viewpoint, properties and equations of state, and applications and special topics. The third topic includes an introduction to statistical thermodynamics.

**MECH 5407 [0.5 credit] (MCG 5347)****Conductive and Radiative Heat Transfer**

Analytical, numerical and analog solutions to steady-state and transient conduction heat transfer in multi-dimensional systems. Radiative heat exchange between black, grey, non-grey diffusive and specular surfaces, including effects of athermanous media.

Also listed as MAAJ 5457.

**MECH 5408 [0.5 credit] (MCG 5348)****Convective Heat and Mass Transfer**

Analogies between heat, mass and momentum transfer. Forced and free convection relations for laminar and turbulent flows analytically developed where possible and otherwise deduced from experimental results, for simple shapes and in heat exchangers. Mass transfer theory and applications.

**MECH 5500 [0.5 credit] (MCG 5350)****Advanced Vibration Analysis**

General theory of continuous and discrete multi-degree-of-freedom vibrating systems. Emphasis on numerical techniques of solving complex vibrating systems, with selected applications from aerospace, civil, and mechanical engineering.

Includes: Experiential Learning Activity

Also listed as MAAJ 5550.

**MECH 5501 [0.5 credit] (MCG 5125)****Advanced Dynamics**

Developing and applying the governing equations of motion for discrete and continuous mechanical systems. Includes Newton-Euler and Lagrangian formulations; classical and finite element approaches for continuous systems; and linear stability, frequency response, and propagation solution methods.

Includes: Experiential Learning Activity

**MECH 5502 [0.5 credit] (MCG 5352)****Optimal Control Systems**

Review of transfer function and state-space system descriptions. Elements of the optimal control problem. Variational calculus. Optimal state feedback control. Riccati equations. Optimal observers and Kalman-Bucy Filters. Extension to discrete time systems including an introduction to dynamic programming. Practical applications are emphasized throughout the course.

**MECH 5503 [0.5 credit] (MCG 5353)****Robotics**

The history of and introduction to robotics methodology. Robots and manipulators; homogeneous transformation, kinematic equations, solving kinematic equations, differential relationships, motion trajectories, dynamics. Control; feedback control, compliance, servomotors, actuators, external and internal sensors, grippers and vision systems. Microprocessors and their application to robot control. Programming.

**MECH 5504 [0.5 credit] (MCG 5354)****Guidance, Navigation and Control**

Guidance system classification, flight control systems, targeting, target tracking, sensing. Modern multivariable control analysis; design requirements, sensitivity, robustness, perturbations, performance analysis. Modern filtering and estimation techniques. Terrestrial navigation; tactical air navigation (TACAN), star trackers Guidance mission and performance. Aircraft, missile and spacecraft guidance and control.

**MECH 5505 [0.5 credit] (MCG 5355)****Stability Theory and Applications**

Fundamental concepts and characteristics of modern stability definitions. Sensitivity and variational equations; linear variational equations; phase space analysis; Lyapunov's direct method. Autonomous and nonautonomous systems; stability in first approximation; the effect of force type on stability; frequency method. Also listed as MAAJ 5555.

**MECH 5506 [0.5 credit] (MCG 5356)****Neuro and Fuzzy Control**

Knowledge-based controllers. Fuzzy control: mathematics, relations, operations, approximate reasoning. Fuzzy knowledge base control and structure. Fuzzification, inference engine, defuzzification. Nonlinear, adaptive fuzzy control systems. Stability, Neuro-control: processing, learning. Adaptation of artificial neural systems: associative memories, algorithms, applications, and network implementation. Neurofuzzy systems: industrial applications.

Precludes additional credit for EACJ 5709 (ELG 5196).

**MECH 5507 [0.5 credit] (MCG 5124)****Advanced Kinematics**

Algebraic-geometry applications: kinematic calibration of serial and in-parallel robots; kinematic synthesis of planar, spherical, spatial mechanisms. Various DH-parametrisations, Jacobian formulations. Topics in: projective geometry; Cayley-Klein geometries; Plücker line coordinates; Gröbner bases; Grassmannians; kinematic mapping; Burmester theory. Emphasis on practical applications.

Includes: Experiential Learning Activity

Also listed as MAAJ 5557.

**MECH 5508 [0.5 credit] (MCG 5326)****System Modelling, Dynamics and Control**

The course provides an understanding of system modelling and the connection between energy domains. Within the temporal and/or frequency domains, system identification techniques and control aspects are explored for discrete and continuous systems along with lumped and distributed parameter models.

**MECH 5509 [0.5 credit] (MCG 5327)****Nonlinear Systems Analysis & Controls**

Introduction to nonlinear systems, stability of periodic solutions and limit cycles. Second-order nonlinear systems. Mathematical foundations for stability analysis, Lyapunov and LaSalle's methods. Autonomous and non-autonomous systems. Input-Output stability formalisms. Basics of nonlinear control techniques based on Lyapunov methods.

**MECH 5601 [0.5 credit] (MCG 5361)****Creative Problem Solving and Design**

Problem-solving processes and how they can be applied in engineering design. Emphasis on learning methodologies rather than accumulating information. Techniques can be successfully applied in any engineering specialty.

Also listed as MAAJ 5657.

**MECH 5602 [0.5 credit] (AMM 5362)****Failure Prevention (Fracture Mechanics and Fatigue)**

Design of engineering structures to ensure against failure due to fatigue or brittle fracture. Nature of fatigue and brittle fracture; selection of suitable material, geometry, and inspection procedures for the load and environmental conditions.

Also listed as MAAJ 5652.

**MECH 5603 [0.5 credit] (AMM 5381)****Lightweight Structures**

Structural behaviour. Fundamentals of basic elasticity. Energy methods of structural analysis. Bending, shear, and torsion of open and closed multicell structures. Bending of plates. Structural idealization and its effects on open and closed sections. Structural stability.

**MECH 5604 [0.5 credit] (AMM 5364)****Computational Metallurgy**

Development of microstructure in alloys in solidification processes and post-solidification processing. Nucleation and growth of solid phase. Formation of a dendrite structure, macro and micro segregations. Pore formation in castings. Thermodynamic and kinetics of phase transformations and structure evolution in solid alloys.

**MECH 5605 [0.5 credit] (MCG 5365)****Finite Element Analysis I**

An introduction to the finite element methodology, with emphasis on applications to heat transfer, fluid flow and stress analysis. The basic concepts of Galerkin's method, interpolation, numerical integration, and isoparametric elements are taught using simple examples.

Also listed as MAAJ 5655.

**MECH 5606 [0.5 credit] (MCG 5366)****Finite Element Analysis II**

Time marching heat flow problems with linear and nonlinear analysis. Static plasticity. Time-dependent deformation problems; viscoplasticity, viscoelasticity, and dynamic analysis. Isoparametric elements and numerical integration are used throughout.

**MECH 5607 [0.5 credit] (MCG 5367)****The Boundary Element Method (BEM)**

Integral equations. The BIE for potential theory and for elastostatics in two-dimensions. Boundary elements and numerical integration schemes. Practical applications.

Includes: Experiential Learning Activity

Also listed as MAAJ 5656.

**MECH 5609 [0.5 credit] (AMM 5123)****Microstructure and Properties of Materials**

Essential microstructural features of metals and alloys: crystal structure, dislocations, grain boundaries. The importance of these features in controlling mechanical properties is emphasized. Analytical techniques observing microstructure in metals and other materials: TEM, SEM, electron diffraction, spectrometry.

Also listed as MAAJ 5659.

**MECH 5700 [0.5 credit] (AMM 5345)****Surfaces and Coatings**

Surface characteristics of solid materials and surface degradation/failure mechanisms including wear, fretting, oxidation, corrosion, and erosion are introduced. Coating methods including PVD, CVD, laser, thermal spray and electrochemical deposition are discussed in the context of failure prevention measures.

Also listed as MAAJ 5750.

**MECH 5701 [0.5 credit] (AMM 5369)****Metallic Phases and Transformations**

Thermodynamics of crystals, phase diagrams, principles of alloy phases, thermal analysis. Transformation rate and mechanisms. Short and long range diffusional transformations, diffusionless transformations. Phase transformations in engineering systems.

Also listed as MAAJ 5751.

**MECH 5704 [0.5 credit] (AMM 5374)****Integrated Manufacturing Systems (CIMS)**

Topics essential to CIMS including computer graphics, geometric modeling, numerically controlled machining, and flexible manufacturing. The fundamental data structures and procedures for computerization of engineering design, analysis and production.

Also offered at the undergraduate level, with different requirements, as MECH 4704, for which additional credit is precluded.

**MECH 5705 [0.5 credit] (MCG 5375)****CAD/CAM**

Computer aided design and manufacturing methodology through hands-on experience and state-of-the-art software. Topics include mathematical representation, solid modeling, drafting, mechanical assembly, mechanism design and CNC machining. CAD data exchange standards, rapid prototyping, concurrent engineering and design for X are also discussed.

**MECH 5800 [0.5 credit] (MCG 5480)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

Also listed as MAAJ 5850.

**MECH 5801 [0.5 credit] (MCG 5489)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

**MECH 5802 [0.5 credit] (MCG 5483)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

Also listed as MAAJ 5852.

**MECH 5803 [0.5 credit] (MCG 5488)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

Also listed as MAAJ 5853.

**MECH 5804 [0.5 credit] (MCG 5384)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

Also listed as MAAJ 5854.

**MECH 5805 [0.5 credit] (MCG 5482)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

Also listed as MAAJ 5855.

**MECH 5806 [0.5 credit] (MCG 5486)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

**MECH 5807 [0.5 credit] (MCG 5487)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

Also listed as MAAJ 5857.

**MECH 5808 [0.5 credit] (MCG 5376)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

Also listed as MAAJ 5858.

**MECH 5809 [0.5 credit] (MCG 5382)****Special Topics in Mechanical and Aerospace Engineering**

Topic will vary from year to year.

**MECH 5906 [0.5 credit]****Directed Studies**

**MECH 5908 [1.5 credit] (MCG 5398)****Independent Engineering Study**

Students pursuing a master's degree by course work carry out an independent study, analysis, and solution of an engineering problem or design project. The results are given in the form of a written report and presented at a departmental seminar.

Includes: Experiential Learning Activity

**MECH 5909 [2.5 credits]****M.A.Sc. Thesis**

Includes: Experiential Learning Activity

**MECH 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Migration and Diaspora Studies

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This section presents the requirements for programs in:

- **M.A. Migration and Diaspora Studies**
- **M.A. Migration and Diaspora Studies with Collaborative Specialization in African Studies**
- **M.A. Migration and Diaspora Studies with Collaborative Specialization in Climate Change**
- **M.A. Migration and Diaspora Studies with Collaborative Specialization in Latin American and Caribbean Studies**
- **Graduate Diploma in Migration and Diaspora Studies**

**M.A. Migration and Diaspora Studies****(5.0 credits)****Requirements - Coursework pathway**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
MGDS 5001 [0.5]	MA Core Seminar: Migration and Diaspora Studies
MGDS 5003 [0.5]	Research Seminar in Migration and Diaspora Studies
<b>2. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	<b>0.5</b>
<b>3. 3.5 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	<b>3.5</b>
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Research essay pathway**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
MGDS 5001 [0.5]	MA Core Seminar: Migration and Diaspora Studies
MGDS 5003 [0.5]	Research Seminar in Migration and Diaspora Studies
<b>2. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	<b>0.5</b>
<b>3. 2.5 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	<b>2.5</b>
<b>4. 1.0 credit in:</b>	<b>1.0</b>
MGDS 5908 [1.0]	Research Essay
Note: a minimum of 9.0 CGPA is required in the first 3.0 credits of coursework for students to continue in the Research essay Pathway.	
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Thesis pathway**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
MGDS 5001 [0.5]	MA Core Seminar: Migration and Diaspora Studies
MGDS 5003 [0.5]	Research Seminar in Migration and Diaspora Studies
<b>2. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	<b>0.5</b>
<b>3. 1.5 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count towards this requirement.	<b>1.5</b>

<b>4. 2.0 credits in:</b>	2.0
MGDS 5909 [2.0] M.A. Thesis	
Note: a minimum of 10.0 CGPA is required in the first 3.0 credits of coursework for students to continue in the Thesis pathway.	

<b>Total Credits</b>	<b>5.0</b>
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### M.A. Migration and Diaspora Studies with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis Pathway:

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	

<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0] Scholarly Preparation in African Studies	

<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	

<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	0.5
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<b>5. 1.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 0.5 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	1.0
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<b>6. 2.0 credits in:</b>	
MGDS 5909 [2.0] M.A. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research Essay Pathway:

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	

<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0] Scholarly Preparation in African Studies	

<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	

<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	0.5
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<b>5. 2.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	2.0
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<b>6. 1.0 credit in:</b>	1.0
MGDS 5908 [1.0] Research Essay	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework Pathway

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	

<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0] Scholarly Preparation in African Studies	

<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	

MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	
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<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	0.5
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<b>5. 2.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	2.0
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<b>6. 1.0 credits in</b> course(s) designated as having sufficient African Studies content, approved by both the MDS Program Director and the Director of African Studies.	1.0
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<b>Total Credits</b>	<b>5.0</b>
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### M.A. Migration and Diaspora Studies with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Thesis Pathway:

<b>1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	

<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	

<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	

<b>4. 1.0 credit from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	1.0
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<b>5. 2.0 credits in:</b>	2.0
MGDS 5909 [2.0] M.A. Thesis (in the specialization)	

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Research Essay Pathway:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	

<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	

<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	

<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	0.5
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<b>5. 1.5 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	1.5
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<b>6. 1.0 credit in:</b>	1.0
MGDS 5908 [1.0] Research Essay (in the specialization)	

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Coursework Pathway

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	

<b>2. 0.0 credit in:</b>	0.0
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	
<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	0.5
<b>5. 2.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	2.0
<b>6. 0.5 credit in</b> a graduate course with sufficient climate change content as approved by the Coordinator of the Climate Change Specialization.	0.5
<b>Total Credits</b>	<b>5.0</b>

### M.A. Migration and Diaspora Studies with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

#### Requirements - Thesis Pathway:

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5] Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0] Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	
<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	0.5
<b>5. 1.0 credits from</b> Migration and Diaspora Studies electives list (see below). Up to 0.5 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	1.0
<b>6. 2.0 credits in:</b>	2.0
MGDS 5909 [2.0] M.A. Thesis (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research Essay Pathway:

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5] Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0] Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	
<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	0.5

<b>5. 2.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	2.0
<b>6. 1.0 credit in:</b>	1.0
MGDS 5908 [1.0] Research Essay (in the specialization)	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework Pathway:

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5] Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0] Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>	1.0
MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies	
MGDS 5003 [0.5] Research Seminar in Migration and Diaspora Studies	
<b>4. 0.5 credit in</b> MGDS at the 5000 level. May not include MGDS 5101.	0.5
<b>5. 2.0 credits from</b> Migration and Diaspora Studies electives (see below). Up to 1.0 credit in Migration and Diaspora Studies practicum placements (MGDS 5101) may count toward this requirement.	2.0
<b>6. 1.0 credits in</b> course(s) designated as having sufficient Latin American and Caribbean Studies content, approved by both the Graduate Supervisor and the Coordinator of Latin American and Caribbean Studies.	1.0
<b>Total Credits</b>	<b>5.0</b>

### Graduate Diploma in Migration and Diaspora Studies (2.0 credits)

#### Requirements (Type 2 and Type 3 Graduate Diploma):

<b>1. 0.5 credit from</b> MGDS at the 5000 level. May not include MGDS 5101.	0.5
<b>2. 1.5 credits from</b> Migration and Diaspora Studies Electives (see below) or, with permission of the program director, 5000-level course(s) in a related field. Only 0.5 credit in MGDS 5101 Practicum in Migration and Diaspora Studies may count toward this requirement.	1.5
<b>Total Credits</b>	<b>2.0</b>

#### Migration and Diaspora Studies Electives List

##### Anthropology

ANTH 5109 [0.5]	Ethnography of Gender
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##### Art History

ARTH 5112 [0.5]	Special Topics in Historiography, Methodology and Criticism (only with approved topics in Migration and Diaspora Studies)
ARTH 5115 [0.5]	Special Topics in Modern and Contemporary Art (only with approved topics in Migration and Diaspora Studies)
ARTH 5117 [0.5]	Special Topics in Community/ Identity
ARTH 5210 [0.5]	Special Topics in Indigenous Art

##### Business

BUSI 5781 [0.5] Seminar in International Business II: Managing in a Global Environment

#### Canadian Studies

CDNS 5101 [0.5] Indigenous Peoples, Canada and the North

CDNS 5102 [0.5] Indigenous Politics and Resurgence in Canada

CDNS 5501 [0.5] Decolonizing Canada: Cultural Politics and Collective Identities

CDNS 5601 [0.5] Constructing Canada: The Politics of National Identity

#### Communication Studies

COMS 5207 [0.5] Communication and Racialization

COMS 5222 [0.5] Cultural Intersections

COMS 5214 [0.5] The Local and the Global

#### Cultural Mediations

CLMD 6102 [0.5] Issues in Transnationalism

#### English

ENGL 5004 [0.5] Studies in Transnational Literatures

ENGL 5008 [0.5] Studies in African Literature

ENGL 5009 [0.5] Studies in South Asian Literature

ENGL 5010 [0.5] Studies in Caribbean Literature

#### European, Russian and Eurasian Studies

EURR 5304 [0.5] Europe and International Migration

#### Film Studies

FILM 5203 [0.5] Issues in World Cinema

FILM 5506 [0.5] Topics in Culture, Identity and Representation

#### French

#### Geography

GEOG 5005 [0.5] Global Environmental Change: Human Implications

GEOG 5201 [0.5] Special Topics in the Geography of Development

GEOG 5400 [0.5] Territory and Territoriality

GEOG 5502 [0.5] Special Topics in Geography of Globalization

GEOG 5600 [0.5] Empire and Colonialism

#### History

HIST 5314 [0.5] Colonialism and Postcolonialism in Canada

HIST 5710 [0.5] Race and Empire

HIST 5712 [0.5] African History Special Topics

HIST 5713 [0.5] Latin America and Caribbean History Special Topics

#### International Affairs

INAF 5499 [0.5] Selected Topics in Health, Displacement and Humanitarian Policy

INAF 5707 [0.5] Complex Humanitarian Emergencies

INAF 5708 [0.5] Humanitarian Assistance: Policies and Issues

INAF 5710 [0.5] Global Governance of Displacement

INAF 5711 [0.5] International Labour Migration

#### Law

LAWS 5007 [0.5] Race, Ethnicity and the Law

LAWS 5663 [0.5] Human Rights, Citizenship and Global Justice

#### Migration and Diaspora Studies

MGDS 5002 [0.5] Key Issues in Migration and Diaspora Studies

MGDS 5101 [0.5] Practicum in Migration and Diaspora Studies

MGDS 5201 [0.5] Migration and Diaspora History Special Topics

MGDS 5900 [0.5] Special Topics in Migration and Diaspora Studies

MGDS 5901 [0.5] Directed Readings in Migration and Diaspora Studies

#### Music

MUSI 5017 [0.5] Music and Globalization

#### Political Science

PSCI 5100 [0.5] Indigenous Activism on Turtle Island: Take That, Colonialism!

PSCI 5107 [0.5] Globalization, Adjustment and Democracy in Africa

PSCI 5200 [0.5] Nationalism

PSCI 5201 [0.5] Politics in Plural Societies

PSCI 5209 [0.5] Forced Migration and Global Politics

PSCI 5211 [0.5] Migration, Globalization and Governance

PSCI 5410 [0.5] Postcolonial Theories and Practices

#### Public Administration

PADM 5422 [0.5] Urban and Local Government

#### Religion

RELI 5850 [0.5] Seminar in the Study of Religion

#### Social Work

SOWK 5011 [0.5] Social Work and Social Justice

SOWK 5015 [0.5] Indigenous Knowledge and Theory for Social Work

SOWK 5021 [0.5] Advanced Social Work Practice with Groups and Communities

SOWK 5702 [0.5] Special Topics in Social Work (only with approved topics in Migration and Diaspora Studies)

#### Sociology

SOCI 5404 [0.5] Race, Ethnicity and Class in Contemporary Societies

SOCI 5406 [0.5] Citizenship and Globalization

Note: With approval of the program director, up to 1.0 credit in courses that are not in Migration and Diaspora Studies but which are relevant to the student's program or research interests may be counted towards the MDS electives requirement.

#### Regulations

See the General Regulations section of this Calendar.

#### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the M.A. Migration and Diaspora Studies, including all concentrations and specializations, is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## **Admission Requirements**

### **M.A. Migration and Diaspora Studies**

The normal requirement for admission to the Master's program is an Honours Bachelor's degree (or equivalent), with at least a B+ average.

For admission to the program, applicants should normally possess a four-year undergraduate degree (or equivalent) in a humanities or social sciences discipline or interdisciplinary program. Previous coursework in Migration and Diaspora Studies is an asset. Practical experience working with migrant or diaspora issues will also be taken into consideration.

### **Accelerated Pathway**

The accelerated pathway in Migration and Diaspora Studies is a flexible and individualized plan of graduate study for students in their final year of a Carleton University undergraduate degree.

Students in their third year of study in a Carleton University undergraduate degree should consult with both the Undergraduate Advisor in their program of study and the Migration and Diaspora Studies Program Director to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### **Accelerated pathway requirements:**

1. At least 1.0 credit in Migration and Diaspora Studies elective courses (5000-level or higher);
2. Minimum overall CGPA of A-.

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### **Admission Requirements for Diploma in Migration and Diaspora Studies (Type 2)**

- Enrolment in a Master's or Doctoral degree program at Carleton University.
- Letter of support from the student's supervisor or, if no supervisor has been assigned, a faculty member in the home program.
- A 1-2 page statement of interest from the applicant outlining the reasons for wishing to enrol in the Migration and Diaspora Studies Diploma program.

### **Admissions Requirements for Diploma in Migration and Diaspora Studies (Type 3)**

- An Honours Bachelor's degree (or equivalent) in a related discipline, with an average of B+ or higher. University transcripts must be submitted as part of the application.
- A 1-2 page statement of interest from the applicant outlining the reasons for wishing to enrol in the Migration and Diaspora Studies Diploma program.

- An academic letter of recommendation. In addition, students with relevant professional or practical experience may submit a letter from their supervisor/ employer.

## **Co-operative Education**

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

## **Application Requirements**

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

## **Participation Requirements**

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.
- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

## **Co-op Participation Agreement**

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

## **Communication with the Co-op Office**

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

## **Graduation with the Co-op Designation**

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

## Employment

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

## Work Term Assessment and Evaluation

### Work Term Evaluation

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

### Work Term Assessment

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

### Voluntary Withdrawal from the Co-op Option

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

### Involuntary or Required Withdrawal from the Co-op Option

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

## International Students

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application**

**process and application requirements with the International Student Services Office.**

## Co-op Fees

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

## Migration and Diaspora Studies Co-operative Education Option

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the M.A. in Migration and Diaspora Studies;
2. have successfully completed, by the start-date of the first work term, 2.0 credits of required courses which must include:
  - a. MGDS 5001 [0.5] MA Core Seminar: Migration and Diaspora Studies
  - b. an additional 0.5 credit in 5000-level MGDS, excluding MGDS 5101
3. be registered as a full-time student in each academic term prior to a work term;
4. be eligible to work in Canada (for off-campus work terms)

For more information, please refer to the Co-operative Education Policy.

## Migration and Diaspora Studies (MGDS) Courses

### MGDS 5001 [0.5 credit]

#### MA Core Seminar: Migration and Diaspora Studies

Advanced overview of major themes in and approaches to both migration studies and diaspora studies, drawing on different disciplinary perspectives.

Prerequisite(s): enrolment in the MGDS MA program or permission of the department.

### MGDS 5002 [0.5 credit]

#### Key Issues in Migration and Diaspora Studies

Social, cultural, economic and political implications of the movement and transnational settlement of people with a multidisciplinary and multiscale approach to topics such as citizenship, forced migration, diasporic communities, exile, immigration, global identities and transnationalism.

### MGDS 5003 [0.5 credit]

#### Research Seminar in Migration and Diaspora Studies

Research design and methodology in migration and diaspora studies. Coursework students design a research project to be completed during the term. Research essay and thesis pathway students produce a proposal and work on the initial stages of their research project.

Includes: Experiential Learning Activity

Prerequisite(s): MGDS 5001 and enrolment in the MGDS MA program or permission of the department.

**MGDS 5101 [0.5 credit]****Practicum in Migration and Diaspora Studies**

Practicum placement in an organization that works in an area relevant to migration and diaspora studies. Requires written academic assignments. Graded SAT/UNS. Includes: Experiential Learning Activity  
Prerequisite(s): permission of the department.

**MGDS 5201 [0.5 credit]****Migration and Diaspora History Special Topics**

Seminar on a topic in the history of Migration and Diaspora. Topic varies from year to year.  
Also listed as HIST 5711.

**MGDS 5202 [0.5 credit]****Topics in Migration and Diaspora: Europe, Russia and Eurasia**

Topics in Migration and Diaspora Studies with a regional focus on Europe, Russia and Eurasia.  
Also listed as EURR 5307.

**MGDS 5900 [0.5 credit]****Special Topics in Migration and Diaspora Studies**

Advanced topics in Migration and Diaspora Studies. Topics vary from term to term.  
Also offered at the undergraduate level, with different requirements, as MGDS 4900, for which additional credit is precluded.

**MGDS 5901 [0.5 credit]****Directed Readings in Migration and Diaspora Studies**

Directed readings on a specific topic in Migration and Diaspora Studies.  
Prerequisite(s): permission of the department.

**MGDS 5908 [1.0 credit]****Research Essay**

A research essay on a topic relating to Migration and Diaspora Studies. The topic must be approved by the program supervisor.  
Includes: Experiential Learning Activity  
Prerequisite(s): permission of the department.

**MGDS 5909 [2.0 credits]****M.A. Thesis**

Includes: Experiential Learning Activity  
Prerequisite(s): permission of the department.

**MGDS 5913 [0.0 credit]****Co-operative Work Term**

Includes: Experiential Learning Activity  
Prerequisite(s): registration in the Co-operative Education Program option in the M.A.

## Music and Culture

This section presents the requirements for programs in:

- **M.A. Music and Culture**
- **M.A. Music and Culture with Collaborative Specialization in Accessibility**
- **M.A. Music and Culture with Collaborative Specialization in African Studies**
- **M.A. Music and Culture with Collaborative Specialization in Digital Humanities**

**Program Requirements****M.A. Music and Culture (5.0 credits)****Requirements - Thesis pathway (5.0 credits)**

<b>1. 1.0 credits in:</b>		1.0
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.0 credits in</b> additional course work chosen from available elective courses		2.0
<b>3. 2.0 credits in:</b>		2.0
MUSI 5909 [2.0]	M.A. Thesis	
<b>Total Credits</b>		<b>5.0</b>

**Requirements - Research essay pathway (5.0 credits)**

<b>1. 1.0 credits in:</b>		1.0
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 3.0 credits in</b> additional course work chosen from available elective courses		3.0
Subject to the approval of the graduate supervisor, 0.5 credit may be taken outside the program in a related discipline.		
<b>3. 1.0 credit in:</b>		1.0
MUSI 5908 [1.0]	Research Essay	
<b>Total Credits</b>		<b>5.0</b>

**Requirements - Coursework pathway (5.0 credits)**

<b>1. 1.0 credits in:</b>		1.0
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 4.0 credits in</b> additional coursework chosen from available elective courses		4.0
Subject to the approval of the graduate supervisor, 1.0 credit may be taken outside the program in a related discipline.		
<b>Total Credits</b>		<b>5.0</b>

**M.A. Music and Culture with Collaborative Specialization in Accessibility (5.0 credits)****Requirements - Thesis pathway:**

<b>1. 1.0 credits in:</b>		1.0
MUSI 5002 [0.5]	Research Methods in Music and Culture	

MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 1.0 credit in</b>	additional MUSI coursework chosen from available electives	1.0
<b>3. 1.0 credit in:</b>		1.0
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>4. 2.0 credits in:</b>		2.0
MUSI 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Research essay pathway:

<b>1. 1.0 credits in:</b>		1.0
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.0 credits in</b>	additional MUSI coursework chosen from available electives	2.0
<b>3. 1.0 credit in:</b>		1.0
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>4. 1.0 credit in:</b>		1.0
MUSI 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### Requirements - Coursework pathway:

<b>1. 1.0 credits in:</b>		1.0
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 3.0 credits in</b>	additional MUSI coursework chosen from available electives, including 0.5 credit designated as having sufficient accessibility content	3.0
<b>3. 1.0 credit in:</b>		1.0
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>Total Credits</b>		<b>5.0</b>

### M.A. Music and Culture with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credits in:</b>		1.0
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 1.5 credit in</b>	additional MUSI course work chosen from available electives	1.5
<b>3. 2.0 credits in:</b>		2.0
MUSI 5909 [2.0]	M.A. Thesis	
<b>4. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	

<b>5. 0.0 credit in:</b>		0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	

**Total Credits 5.0**

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 1.0 credits in:</b>		1.0
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.5 credits in</b>	additional MUSI course work chosen from available elective courses	2.5
<b>3. 1.0 credit in:</b>		1.0
MUSI 5908 [1.0]	Research Essay	
<b>4. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>5. 0.0 credit in:</b>		0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	

**Total Credits 5.0**

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 1.0 credits in:</b>		1.0
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.5 credits in</b>	additional MUSI course work chosen from available elective courses	2.5
<b>3. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>4. 0.0 credit in:</b>		0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>5. 1.0 credit from:</b>		1.0
AFRI 5050 [0.5]	Selected Topics in African Studies	
AFRI 5100 [0.5]	African Studies Abroad	
AFRI 5700 [0.5]	Directed Readings in African Studies	
AFRI 5900 [0.5]	Placement	
ANTH 5109 [0.5]	Ethnography of Gender	
ANTH 5209 [0.5]	Special Topics in Ethnography of Contemporary Africa	
ANTH 5809 [0.5]	Special Topics in the Anthropology of Development	
ENGL 5008 [0.5]	Studies in African Literature	
ENGL 5010 [0.5]	Studies in Caribbean Literature	
FREN 5212 [0.5]	Littératures francophones	
INAF 5603 [0.5]	Issues in Development in Africa	
LAWS 5007 [0.5]	Race, Ethnicity and the Law	
LAWS 5603 [0.5]	International Law: Theory and Practice	
PSCI 5107 [0.5]	Globalization, Adjustment and Democracy in Africa	
PSCI 5202 [0.5]	Development Theory and Issues	
PSCI 5203 [0.5]	Southern Africa After Apartheid	

SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies	
WGST 5902 [0.5]	Advanced Topics in Women's and Gender Studies II	
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Music and Culture with Collaborative Specialization in Digital Humanities (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits)**

<b>1. 1.0 credits in:</b>		<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 1.0 credit in</b>	additional MUSI course work chosen from available electives	<b>1.0</b>
<b>3. 2.0 credits in:</b>		<b>2.0</b>
MUSI 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit from</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	<b>0.5</b>
<b>6. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	0.0
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research essay pathway (5.0 credits)**

<b>1. 1.0 credits in:</b>		<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.0 credits</b>	additional MUSI course work chosen from available elective courses	<b>2.0</b>
<b>3. 1.0 credit in:</b>		<b>1.0</b>
MUSI 5908 [1.0]	Research Essay (in the specialization)	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>5. 0.5 credit from</b>	DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)	<b>0.5</b>
<b>6. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Coursework pathway (5.0 credits)**

<b>1. 1.0 credits in:</b>		<b>1.0</b>
MUSI 5002 [0.5]	Research Methods in Music and Culture	
MUSI 5003 [0.5]	Intellectual Histories and Current Directions in Music and Culture	
<b>2. 2.5 credits in</b>	additional MUSI course work chosen from available elective courses	<b>2.5</b>
<b>3. 0.5 credit in:</b>		<b>0.5</b>
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>4. 1.0 credit from:</b>		<b>1.0</b>

DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities	
DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities	
DIGH 5902 [0.5]	Special Topics in Digital Humanities	
- or annually listed DIGH course		
<b>5. 0.0 credit in:</b>		<b>0.0</b>
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>5.0</b>

### **Regulations**

See the General Regulations section of this Calendar.

A standing of B- or higher must be obtained in each course counted towards the Master's degree.

### **Deadlines**

**Thesis Proposal:** full-time students normally will submit their thesis or research essay proposal to the graduate committee no later than April 15 of the first year of registration for students enrolled full-time, and no later than the middle of the fifth term of registration for students enrolled part-time.

Regulations governing requirements for the Master's thesis, including deadlines for submission, are outlined in the General Regulations section of this Calendar.

### **Admission Requirements**

The minimum requirement for admission to the Master's program in Music and Culture is either a B.Mus. degree or a B.A. Honours degree in Music with a minimum B+ average.

Applicants with a B.A. Honours in a related discipline (e.g., Mass Communication, Women's Studies, Philosophy, or Cultural Studies), with a minimum average of B+, will also be considered provided the applicant can demonstrate a strong background in some form of music.

There are no performance requirements for admission to this degree program.

Applicants without a B.Mus. or B.A. Honours degree in Music, or a related discipline, but who have a three-year degree with a minimum average of B+, may be admitted to a qualifying year program. Students who complete the qualifying year requirements with a minimum average of B+ will be considered for admission to the Master's program.

### **Accelerated Pathway**

The accelerated pathway in the M.A. in Music and Culture is a flexible and individualized plan of graduate study.

Students in their final year of a Carleton Bachelor of Music or Bachelor of Arts (Honours, Music Major or Minor) with demonstrated excellent aptitude for research may qualify for this option.

Students in their third-year of study in the B.Mus. or B.A. Honours should consult with both the Undergraduate Supervisor and the Graduate Supervisor of the Music program to determine if the accelerated pathway is

appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### **Accelerated Pathway Requirements**

1. Elective MUSI courses at the 5000-level with a grade of B+ or higher.
2. Minimum overall CGPA of A-

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### **Music (MUSI) Courses**

Note: the majority of courses are open to non-Majors; students are advised to consult the Discipline. Priority is given to Music students.

#### **MUSI 5000 [0.5 credit]**

##### **Music and Cultural Theory I: Intellectual Histories**

Major intellectual trends relevant to cultural theory and their application to the study of music. Topics may include: Marxism and critical theory, anthropological and sociological theory, philosophical aesthetics, psychoanalysis, feminism and gender theory, post-colonial studies, and cultural studies.

Includes: Experiential Learning Activity

Precludes additional credit for MUSI 5001 (no longer offered).

#### **MUSI 5002 [0.5 credit]**

##### **Research Methods in Music and Culture**

The research process, including the phases of conceptualization, gathering of sources, and writing up the completed research. Topics include: issues related to applying interdisciplinary methodologies to musical objects of study, conducting ethnographic research and writing for scholarly publications, conference presentations, and grant applications.

Includes: Experiential Learning Activity

#### **MUSI 5003 [0.5 credit]**

##### **Intellectual Histories and Current Directions in Music and Culture**

Major intellectual trends and selected contemporary debates within cultural theory and their application to the study of music. The focus will be on a limited range of topics and debates selected by the instructor for in-depth discussion and analysis.

Includes: Experiential Learning Activity

#### **MUSI 5004 [0.5 credit]**

##### **Music and Cultural Theory II: Current Debates**

Selected debates within contemporary theory and culture and their relevance to music. The focus will be on a limited range of debates and issues selected by the instructor for in-depth discussion and analysis. Topics will vary from year to year.

Includes: Experiential Learning Activity

Prerequisite(s): MUSI 5000 or permission of the School.

#### **MUSI 5006 [0.5 credit]**

##### **Music and Identity**

Music as a medium for the construction and maintenance of cultural identities, including the relationship between music and traditional cultures, geography, the nation state, urban subcultures, gender and sexuality, race, class, and ethnicity.

Includes: Experiential Learning Activity

#### **MUSI 5007 [0.5 credit]**

##### **Music and Visual Culture**

The relationships between musical and visual cultures, including traditional arts, fine art painting, film, television, and digital gaming and interactive media, and the ways in which meanings are dependent upon the various connections between them.

Includes: Experiential Learning Activity

#### **MUSI 5008 [0.5 credit]**

##### **Technologies of Music**

The role that technologies, including musical instruments, notation, sound recording, and digital media, play in the concepts and practices associated with music. Topics include: technology as material culture, technology and musical practices, and the increasing importance of technology in contemporary music and culture.

#### **MUSI 5009 [0.5 credit]**

##### **Music, Meaning and Representation**

Theories of meaning and representation as applied to music. Major source traditions and critiques to be considered include: semiotics and structuralism, analytic philosophy, formalism, cognitive theory, and post-structuralism.

Includes: Experiential Learning Activity

#### **MUSI 5011 [0.5 credit]**

##### **Music and Social Institutions**

Historical relationships between music and society, including that of Western art music to sacred and secular institutions; the rise of the cultural industries (sound recording, radio and film); the relationship of science, the arts, and the academy; and state policies of arts funding and multiculturalism.

Includes: Experiential Learning Activity

#### **MUSI 5013 [0.5 credit]**

##### **Music and Performance**

Music as a form of social practice rooted in traditions of performance. The variable, multimodal character of music as understood through theories of performance and gesture drawn from the histories and literatures of music, theatre, and dance (in art, popular, and non-Western forms).

Includes: Experiential Learning Activity

**MUSI 5015 [0.5 credit]****Music, Migration and Diaspora in Canada**

Issues of anthropological, sociological, and analytical significance are examined in the context of selected developments in folklore and ethnomusicological research on Canadian traditions.

Includes: Experiential Learning Activity

Precludes additional credit for MUSI 5101 (no longer offered).

Also offered at the undergraduate level, with different requirements, as MUSI 4103, for which additional credit is precluded.

**MUSI 5016 [0.5 credit]****First Peoples Music in Canada**

The context and significance of musical expressions of selected Canadian Indigenous groups and the contributions of individuals in the creation of music and meaning in First Peoples' communities.

Includes: Experiential Learning Activity

Precludes additional credit for MUSI 5102 (no longer offered).

Also offered at the undergraduate level, with different requirements, as MUSI 4104, for which additional credit is precluded.

**MUSI 5017 [0.5 credit]****Music and Globalization**

Music's role in the multifaceted and complex processes of globalization. Drawing on case studies of "world musics" this course explores how sound and music negotiate histories of post/colonialism, cultural and economic imperialism, and constructions of sameness and difference in "world music" contexts.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as MUSI 4304, for which additional credit is precluded.

**MUSI 5018 [0.5 credit]****Music and Social Justice**

This course explores the varied roles that music has played—and continues to play—as an agent of positive social change, offering students innovative opportunities to reflect/act on the relationships between music and human rights and to forge connections between academic work and struggles for social justice.

Includes: Experiential Learning Activity

**MUSI 5019 [0.5 credit]****Music and Communities**

An exploration of various community music practices, theories and priorities. Topics include community music-making in relation to human participation and interaction, musical leadership and facilitation, and Community Music as a scholarly area of inquiry.

Includes: Experiential Learning Activity

**MUSI 5020 [0.5 credit]****Sound Studies**

Engage in the humanistic study of sound in its social, aesthetic, physiological, and technological dimensions.

Topics may include acoustics, listening, sound art, soundscape ecology, noise, and sonic futures.

Includes: Experiential Learning Activity

**MUSI 5021 [0.5 credit]****Improvisation Studies**

Examines improvisation as a musical and social process, and as a site for community building, identity formation, civic dialogue, and political action. Topics include improvisation in relation to history/historiography, race, gender, sexuality, pedagogy, and disability studies.

Includes: Experiential Learning Activity

**MUSI 5022 [0.5 credit]****Music and Disability**

The varied and complex intersections between music and disability in the past and present. Topics include disability and musical creation and performance, representations of disability in classical and popular music, and music and non-visible and cognitive disabilities.

Includes: Experiential Learning Activity

**MUSI 5023 [0.5 credit]****Music and Ethnography in Ottawa**

In this course students explore issues and practices in ethnographic music research through an individual project based in the city Ottawa and/or neighbouring community. Topics explored include research ethics, project design, interviewing techniques, field notes, participant observation and researcher positionality.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as MUSI 4102, for which additional credit is precluded.

**MUSI 5024 [0.5 credit]****Music and Media**

The intersections of diverse musics and musical styles with audio and audiovisual media from academic, analytical, historical and critical perspectives. Topics may include music for film, television, and video games, music video, and broadcast and recorded music.

Includes: Experiential Learning Activity

**MUSI 5200 [0.5 credit]****Special Topics in Music and Cultural Theory**

Selected topics focusing on aspects of music and cultural theory not available in regular program offerings. Topic will vary from year to year.

**MUSI 5201 [0.5 credit]****Special Topics in Music Genres**

Selected topics focusing on specific genres of music not available in regular program offerings. Topic will vary from year to year.

**MUSI 5909 [2.0 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

**MUSI 5300 [0.5 credit]****Practicum in Music**

Academically informed practical experience in music-specific projects such as music recording, librarianship, concert management, research, multimedia creation at local institutions. A maximum of 1.0 credit of practicum may be used in fulfilment of M.A. requirements.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School.

**MUSI 5400 [0.5 credit]****Advanced Studies in Performance**

Advanced study for voice or instrument in classical, traditional or popular idioms. The course requires a lecture-recital arranged in consultation with the Graduate Supervisor and the Supervisor of Performance Studies. This course is non-repeatable.

Includes: Experiential Learning Activity

Prerequisite(s): Proposal, audition, enrolment in the MA program and permission of the Graduate Supervisor and Supervisor of Performance Studies.

Individual instruction on a bi-weekly basis. 0.5 credit for full year course.

**MUSI 5401 [0.5 credit]****Advanced Studies in Composition**

Advanced study in composition in classical, jazz or popular idioms. The student will be required to assemble a portfolio of work as a final project for the course. This course is non-repeatable.

Includes: Experiential Learning Activity

Prerequisite(s): Proposal, portfolio of compositions, enrolment in the MA program, and permission of the Graduate Supervisor.

Individual instruction on a bi-weekly basis. 0.5 credit for a full year course.

**MUSI 5900 [0.5 credit]****Directed Readings and Research**

Course designed to permit students to pursue research on topics in music and culture chosen in consultation with a member of the faculty. A maximum of 1.0 credit of directed studies may be used in fulfilment of M.A. requirements.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School.

**MUSI 5908 [1.0 credit]****Research Essay**

Includes: Experiential Learning Activity

## Networking Technology

This section presents the requirements for programs in:

- **M.A.Sc. Networking Technology**
- **M.A.Sc. Networking Technology with Collaborative Specialization in Cybersecurity**
- **Master of Networking Technology**
- **Master of Networking Technology with Collaborative Specialization in Cybersecurity**

### Program Requirements

#### M.A.Sc. Networking Technology (5.0 credits)

##### Requirements:

<b>1. 0.0 credit in:</b>		
ITEC 5001 [0.0]	Information Technology Seminars	
<b>2. 1.5 credits from</b>	core courses (For students admitted to 4.0-credit program, 1.0 credit):	1.5
ITEC 5100 [0.5]	Planning and Design of Computer Networks	
ITEC 5101 [0.5]	Cross Layer Design for Wireless Multimedia Networks	
ITEC 5102 [0.5]	Designing Secure Networking and Computer Systems	
ITEC 5103 [0.5]	Cloud and Datacentre Networking	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5910 [0.5]	Special Topics in Network Technologies	
<b>3. 1.0 credit in</b>	electives at the 5000-level, chosen in consultation with your graduate advisor/supervisor or the Associate Director of Graduate Studies in the School.	1.0
<b>4. 2.5 credits in:</b>		2.5
ITEC 5909 [2.5]	Master's Thesis	
<b>Total Credits</b>		<b>5.0</b>

#### M.A.Sc. Networking Technology with Collaborative Specialization in Cybersecurity (5.0 credits)

##### Requirements:

<b>1. 1.0 credit in:</b>		
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	1.0
<b>2. 0.0 credit in:</b>		
ITEC 5001 [0.0]	Information Technology Seminars	
<b>3. 1.0 credit from</b>	core courses:	1.0
ITEC 5100 [0.5]	Planning and Design of Computer Networks	
ITEC 5101 [0.5]	Cross Layer Design for Wireless Multimedia Networks	
ITEC 5102 [0.5]	Designing Secure Networking and Computer Systems	
ITEC 5103 [0.5]	Cloud and Datacentre Networking	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5910 [0.5]	Special Topics in Network Technologies	
<b>4. 0.5 credits in</b>	electives at the 5000-level, chosen in consultation with your graduate advisor/supervisor or the Associate Director Graduate Study in the School.	0.5

<b>5. 2.5 credits in:</b>		2.5
ITEC 5909 [2.5]	Master's Thesis (in the area of the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### Master of Networking Technology (5.0 credits)

##### Requirements:

<b>1. 0.0 credit in:</b>		
ITEC 5001 [0.0]	Information Technology Seminars	
<b>2. 2.5 credits from</b>	core courses:	2.5
ITEC 5100 [0.5]	Planning and Design of Computer Networks	
ITEC 5101 [0.5]	Cross Layer Design for Wireless Multimedia Networks	
ITEC 5102 [0.5]	Designing Secure Networking and Computer Systems	
ITEC 5103 [0.5]	Cloud and Datacentre Networking	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5910 [0.5]	Special Topics in Network Technologies	
<b>3. 2.5 credits in</b>	electives at the 5000-level, chosen in consultation with your graduate advisor/supervisor or the Associate Director of Graduate Studies in the School.	2.5
<b>Total Credits</b>		<b>5.0</b>

#### Master of Networking Technology with Collaborative Specialization in Cybersecurity (5.0 credits)

##### Requirements:

<b>1. 1.0 credit in:</b>		
CYBR 5000 [1.0]	Science and Social Science of Cybersecurity	1.0
<b>2. 0.0 credit in:</b>		
ITEC 5001 [0.0]	Information Technology Seminars	
<b>3. 2.0 credits from</b>	core courses:	2.0
ITEC 5100 [0.5]	Planning and Design of Computer Networks	
ITEC 5101 [0.5]	Cross Layer Design for Wireless Multimedia Networks	
ITEC 5102 [0.5]	Designing Secure Networking and Computer Systems	
ITEC 5103 [0.5]	Cloud and Datacentre Networking	
ITEC 5205 [0.5]	Design and Development of Data-Intensive Applications	
ITEC 5910 [0.5]	Special Topics in Network Technologies	
<b>4. 0.5 credit in</b>	the area of the specialization, approved by the graduate supervisor or the Associate Director of Graduate Studies in the School.	0.5
<b>5. 1.5 credits in</b>	electives at the 5000-level, chosen in consultation with your graduate advisor/supervisor or the Associate Director of Graduate Studies in the School.	1.5
<b>Total Credits</b>		<b>5.0</b>

### Admission

#### Networking Technology - M.A.Sc., M.N.T.

Students entering the program will have an undergraduate degree in network technology, electrical engineering,

computer science, engineering, or a closely-related discipline.

All students will apply for either the 5.0 credit M.A.Sc. or the M.N.T.

Applicants with substantial professional experience in network technology in Canada may be considered for admission to professional entry, requiring them to complete 4.0 credits, to be determined by the School of Information Technology and Graduate Studies.

### **Accelerated Pathway Networking Technology**

The accelerated pathway in the M.A.Sc. Networking Technology and M. Networking Technology is a flexible and individualized plan of graduate study. Students in their final year of any relevant Carleton undergrad degree with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third or fourth year in the relevant degree should consult with both their Undergraduate Program Coordinator and the CSIT Associate Director for Graduate Studies to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### **Accelerated Pathway Requirements:**

1. At least 0.5 credit from: ITEC 5110, ITEC 5111, ITEC 5112, ITEC 5113, ITEC 5114 with a grade of B+ or higher;
2. Minimum overall CGPA of A-.

Students may receive advanced standing with transfer of up to 1.0 credit, which can reduce their time to completion. *Students presenting a demonstrated research ability (e.g. primary author of a research report), supported by the proposed thesis supervisor, and approved by the CSIT Associate Director for Graduate Studies, may be eligible to receive credit for ITEC 5002 [0.5 credit] Fundamentals of Information Technology Research.*

### **Regulations**

See the General Regulations section of this Calendar.

### **Information Technology (ITEC) Courses**

#### **ITEC 5001 [0.0 credit]**

##### **Information Technology Seminars**

A seminar based course where the students make the presentations and participate in discussions. Some seminars done by guest lecturers. Graded Sat/Uns. Includes: Experiential Learning Activity

#### **ITEC 5002 [0.5 credit]**

##### **Fundamentals of Information Technology Research**

Basic concepts and techniques in information technology, including information systems, algorithms and software development process, research methods, and research and technical writing.

Includes: Experiential Learning Activity

Precludes additional credit for ITEC 5000 (no longer offered).

#### **ITEC 5010 [0.5 credit]**

##### **Applied Programming I**

Algorithm design and computer programming with practical industry problems in information technology. Topics include algorithms and pseudocode, programming fundamentals, memory operations, data structures, object oriented programming, program design, testing and debugging.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the graduate supervisor.

#### **ITEC 5100 [0.5 credit]**

##### **Planning and Design of Computer Networks**

Planning process of computer networks; needs and technical requirements; modeling of different network planning problems; exact and approximate algorithms; topological planning and expansion problems; equipment (switch, router) location problem; approximate and optimal routing algorithms; presentation of various case studies.

Includes: Experiential Learning Activity

#### **ITEC 5101 [0.5 credit]**

##### **Cross Layer Design for Wireless Multimedia Networks**

Quality of service measures at different layers. Parameter adaptation, trade-offs, and optimization at physical, data-link, network, transport, and application layers. Cross-layer design in cellular, ad hoc, sensor, local area, green, and cognitive radio networks.

#### **ITEC 5102 [0.5 credit]**

##### **Designing Secure Networking and Computer Systems**

Network security with coverage of computer security in support of networking concepts. Security issues in data networks at different protocol layers. Routing security, worm attacks, and botnets. Security of new mobile networks and emerging networked paradigms such as social networks and cloud computing.

#### **ITEC 5103 [0.5 credit]**

##### **Cloud and Datacentre Networking**

Special issues of the networking requirements in datacentres and cloud computing environments. Performance, power requirements, redundancy of datacentre networks.

**ITEC 5110 [0.5 credit]****Emerging Network Technologies**

Overview of technologies, protocols and techniques related to Information Technology networking that are either in their early stage of adoption or are not yet mainstream (i.e. beta or prototype stage). Focus will vary from year to year to reflect the evolutionary nature of this domain.

Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4000, for which additional credit is precluded.

**ITEC 5111 [0.5 credit]****Multimedia Networking**

Audio and video compression. H.261, JPEG, MPEG and DVI. Accessing audio and video from a web server. Real Time Streaming Protocol (RTSP). Multimedia operating systems. Multimedia database. Network support for multimedia applications. Multimedia synchronization. Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4007, for which additional credit is precluded.

**ITEC 5112 [0.5 credit]****Secure Mobile Networking**

The concept, principle and rationale of mobile networking. Mobile network architecture, protocols, mobility management, routing and mobile TCP/IP; Security challenges, vulnerabilities and threats in mobile networks; Security defense techniques and countermeasures in mobile networks.

Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4010, for which additional credit is precluded.

**ITEC 5113 [0.5 credit]****Network Simulation**

Introduction to discrete event simulation; fundamental stochastic models for networking; queueing theory; deterministic algorithms for networking; confidence intervals; introduction to network modeling. Simulation exercises including traffic monitoring, congestion, routing protocols, resource utilization and growth planning using OPNET simulation tool.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4001, for which additional credit is precluded.

**ITEC 5114 [0.5 credit]****Networked Applications**

Architectures for computing in modern data networks that adopt the Internet architecture. Topics covered include socket programming, RPC and RMI. Client-server and peer-to-peer models. Emerging application architectures. Prerequisite(s): permission of the graduate supervisor. Also offered at the undergraduate level, with different requirements, as NET 4005, for which additional credit is precluded.

**ITEC 5200 [0.5 credit]****Entertainment Technologies**

Advanced topics in entertainment technologies which may include web-based, film and television, video games and/or interactive systems.

**ITEC 5201 [0.5 credit]****Computer Animation Technologies**

Advanced topics in computer animation: full body motion capture, space-time systems, physics-based animation, realistic rendering techniques, industry methods for large scene animations and live action integration; behavioural animation.

**ITEC 5202 [0.5 credit]****Visual Effects Technologies**

Advanced look at the processes and technologies in visual effects, specifically in advanced processing of virtual sets (e.g. using chroma-keying), lighting and colour integration, filming technologies, motion tracking, and the integration of 3D objects/elements into real scenes.

**ITEC 5203 [0.5 credit]****Game Design and Development Technologies**

Advanced technologies in the development of computer game systems and gameplay experiences, focused on Procedural Content Generation. Automatic or semi-automatic methods for producing game levels, objects, characters, and narratives.

**ITEC 5204 [0.5 credit]****Emerging Interaction Techniques**

Advanced interaction styles and their associated technologies. Topics may include hand held and gestural interactions, ubiquitous computing, deformable user interfaces, physiological computing and tangible user interfaces.

Also listed as HCIN 5300.

**ITEC 5205 [0.5 credit]****Design and Development of Data-Intensive Applications**

Design and development of data-intensive applications dealing with large-scale data. Data may include spatial data, time series, text, social media and different forms of digital media. Data modeling and management techniques will be discussed that enhance data analysis techniques and improve data-intensive applications.

**ITEC 5206 [0.5 credit]****Data Protection and Rights Management**

Understanding how to use technology to implement data privacy, security, protection and related legal issues. Insights on how to develop systems for managing digital rights, data privacy rules, laws or policies relevant to different jurisdictions, rights, and responsibilities for protecting data and personal information. Precludes additional credit for DATA 5002.

**ITEC 5207 [0.5 credit]****Data Interaction Techniques**

Design and development of how humans (e.g., end-users, knowledge-users and expert-users) interact with data ecosystem like data collection, storage, analysis and visualization. Techniques, methods and tools will be discussed on how humans interact with data based on capabilities of machines and needs of humans.

**ITEC 5208 [0.5 credit]****Virtual Reality and 3D User Interfaces**

Research in and design of virtual reality and 3D systems. Applications, history, human factors, display and input hardware, and interaction techniques for navigation, selection and manipulation. Students develop and evaluate a VR or 3D system using game engines and devices such as head-mounted displays. Includes: Experiential Learning Activity. Also listed as HCIN 5501.

**ITEC 5209 [0.5 credit]****Empirical Research Methods in HCI**

Advanced quantitative methods and conducting controlled user studies, statistically analyzing and reporting results in a research paper. Topics include history of empirical HCI, experiment design, hypothesis testing, interaction models, and scientific writing. Students complete a term-long research project. Includes: Experiential Learning Activity. Also listed as HCIN 5407. Also offered at the undergraduate level, with different requirements, as ITEC 4021, for which additional credit is precluded.

**ITEC 5900 [0.5 credit]****Directed Studies**

A course of independent study that fits the student's area of interest under the supervision of a faculty member of the School.

**ITEC 5909 [2.5 credits]****Master's Thesis**

Includes: Experiential Learning Activity

**ITEC 5910 [0.5 credit]****Special Topics in Network Technologies**

Recent and advanced topics in network technologies. Trends in wireless networking, software defined networks, power-line networking. Students may be expected to contribute to lectures or seminars.

**ITEC 5920 [0.5 credit]****Special Topics in Digital Media**

Recent and advanced topics in Digital Media. Students may be expected to contribute to lectures or seminars.

**ITEC 6200 [0.5 credit]****Introduction to Interdisciplinary Research in Information Technology**

Introduction to concepts and practices for research in Information Technology. Understanding the defining properties of computer-based systems and related technologies. Emphasis on bringing together skills related to technology, people and content in order to solve problems and explore new possibilities.

**ITEC 6900 [0.5 credit]****Directed Studies**

A course of independent study that fits the student's area of interest under the supervision of a faculty member of the School.

**ITEC 6907 [0.0 credit]****Doctoral Qualifying Examination**

Ph.D. qualifying examination in the student's field. The exam consists of a written submission and an oral examination.

**ITEC 6908 [0.0 credit]****Doctoral Proposal**

Ph.D. thesis proposal. Defending a proposal consists of a written submission and an oral examination. Prerequisite(s): ITEC 6907 and permission of the School.

**ITEC 6909 [0.0 credit]****Doctoral Thesis**

Includes: Experiential Learning Activity

Prerequisite(s): ITEC 6908 and permission of the School.

**ITEC 6920 [0.5 credit]****Selected Topics in Digital Media**

Recent and advanced topics in Digital Media. Students are expected to contribute to lectures or seminars.

## Neuroscience

This section presents the requirements for programs in:

- **M.Sc. Neuroscience**
- **M.Sc. Neuroscience with Collaborative Specialization in Accessibility**
- **Ph.D. Neuroscience**

**Program Requirements****M.Sc. Neuroscience (5.0 credits)****Requirements:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
NEUR 5100 [1.0]	Fundamentals in Neuroscience	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
NEUR 5201 [0.5]	Foundations in Statistics for Neuroscience	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
NEUR 5203 [0.5]	Systematic Reviews and Meta-Analysis	
NEUR 5800 [0.5]	Special Topics in Neuroscience	
NEUR 5801 [0.5]	Knowledge Mobilization	
Or additional graduate level course offered by units outside of Carleton's Neuroscience Department, with approval from the Graduate Chair		
<b>4. 3.0 credits in:</b>		<b>3.0</b>
NEUR 5909 [3.0]	M.Sc. Thesis	
<b>Total Credits</b>		<b>5.0</b>

**M.Sc. Neuroscience with Collaborative Specialization in Accessibility (5.5 credits)****Requirements:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
NEUR 5100 [1.0]	Fundamentals in Neuroscience	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
NEUR 5201 [0.5]	Foundations in Statistics for Neuroscience	
<b>4. 3.0 credits in:</b>		<b>3.0</b>
NEUR 5909 [3.0]	M.Sc. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.5</b>

**Ph.D. Neuroscience (3.0 credits)****Requirements:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
NEUR 6100 [1.0]	Advanced Seminar in Neuroscience	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
NEUR 6200 [1.0]	Comprehensive Examination (to be completed within the first two years of PhD study)	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
NEUR 5201 [0.5]	Foundations in Statistics for Neuroscience (unless taken previously, in which case substitute with 0.5 credits from item #4)	

<b>4. 0.5 credit from:</b>	0.5
NEUR 5203 [0.5]	Systematic Reviews and Meta-Analysis
NEUR 5800 [0.5]	Special Topics in Neuroscience
NEUR 5801 [0.5]	Knowledge Mobilization
NEUR 6301 [0.5]	Techniques in Neuroscience I
NEUR 6302 [0.5]	Techniques in Neuroscience II
NEUR 6401 [0.5]	Independent Research in Neuroscience I
NEUR 6402 [0.5]	Independent Research in Neuroscience II
NEUR 6501 [0.5]	Directed Studies in Neuroscience I
NEUR 6502 [0.5]	Directed Studies in Neuroscience II
Or additional graduate level course in another discipline with the approval from the Graduate Chair	
<b>5. 0.0 credits in:</b>	0.0
NEUR 6909 [0.0]	Ph.D. Thesis (candidates must successfully complete a research thesis on a topic in Neuroscience supervised by a faculty member in the Department of Neuroscience)
<b>Total Credits</b>	<b>3.0</b>

## Regulations

See the General Regulations section of this Calendar.

## Admission

The minimum requirement for admission to the Master's program in Neuroscience is either a B.Sc. Honours in Neuroscience, Biology, or related field, or a B.A. Honours in Psychology. Applicants with other bachelor's honours degrees in related disciplines will also be considered provided the applicant can demonstrate a strong background that relates to neuroscience.

In addition to transcripts and letters of reference, application packages must include a statement of interest.

Meeting the minimum requirements does not automatically guarantee acceptance into the program.

## Admission

An M.Sc. from an appropriate university is usually required for entry to the Ph.D. program.

Meeting the minimum requirements does not automatically guarantee acceptance into the program. In addition to transcripts and letters of reference, application packages must include a statement of interest.

## Fast Track Option

Students who enroll in the M.Sc. program, and intend to subsequently continue into a Ph.D., may have the option of being fast-tracked into the Ph.D. program. Eligibility will be determined by recommendation from the M.Sc. thesis committee, the Graduate Chair in Neuroscience, and the Vice Provost (Graduate Studies). Advanced standing will be given for NEUR 5201. The decision and required approvals to fast track must be completed by July 31 of the student's third semester.

Regulations governing requirements for the Master's thesis, including deadlines for submission, are outlined in the General Regulations section of this Calendar.

## Neuroscience (NEUR) Courses

### NEUR 5100 [1.0 credit]

#### Fundamentals in Neuroscience

A general course covering core neuroscience topics including organization of the nervous system, sensory and motor systems, neuroendocrinology, motivation learning and memory, emotion, attention, and pathology. Course includes attendance of the neuroscience colloquium series.

Also listed as BIOL 5304.

Precludes additional credit for PSYC 5200.

### NEUR 5201 [0.5 credit]

#### Foundations in Statistics for Neuroscience

Extensive use of statistical software to analyze neuroscience data sets to gain practical applied statistical skills. Concepts include data management, statistical modelling through analysis of variance and regression, covariates and hierarchical techniques.

Includes: Experiential Learning Activity

### NEUR 5203 [0.5 credit]

#### Systematic Reviews and Meta-Analysis

Introduces the methodology for conducting systematic reviews and meta-analysis. Topics include: conducting literature searches, extracting relevant literature, assessing quality of studies, and synthesizing findings across studies. Students will be expected to identify a research question, identify relevant literature, and carry out the statistical software.

Prerequisite(s): NEUR 5201.

Also offered at the undergraduate level, with different requirements, as NEUR 4002, for which additional credit is precluded.

### NEUR 5800 [0.5 credit]

#### Special Topics in Neuroscience

An in depth study of current topics in neuroscience and health. Course content varies yearly and has recently included cognitive neuroscience, neuropharmacology, neurodegeneration, neuroimmunology, behavioural medicine, neurobiology of learning and memory, brain mechanisms of ingestive behaviour and energy balance, and molecular neuroscience.

Also listed as BIOL 6203.

**NEUR 5801 [0.5 credit]****Knowledge Mobilization**

Knowledge mobilization concepts, tools, and frameworks, the challenges and value of translational research, and processes involved in integrated knowledge mobilization. Skills to maximize research impacts will be developed.

Includes: Experiential Learning Activity

Precludes additional credit for HLTH 5300.

Also offered at the undergraduate level, with different requirements, as NEUR 4003, for which additional credit is precluded.

**NEUR 5909 [3.0 credits]****M.Sc. Thesis**

Includes: Experiential Learning Activity

**NEUR 6100 [1.0 credit]****Advanced Seminar in Neuroscience**

A comprehensive pro-seminar series, covering issues ranging from cellular and molecular processes through to neural systems and behaviours as well as psychopathology. Students will also be required to attend the Neuroscience colloquia series as part of this course. Also listed as BIOL 6305.

Precludes additional credit for PSYC 6200, PSYC 6202, PSYC 6203, BIOL 6303, BIOL 6306.

Prerequisite(s): NEUR5100 or equivalent.

**NEUR 6200 [1.0 credit]****Comprehensive Examination**

The comprehensive examination will consist of both a written thesis proposal and oral candidacy exam. Specific details for both are outlined in the Neuroscience graduate handbook. The comprehensive examination must be completed in its entirety by the end of the 7th semester of PhD study.

**NEUR 6301 [0.5 credit]****Techniques in Neuroscience I**

Completion of a research project carried out under the supervision of a neuroscience faculty member, normally not the current supervisor. The student will learn a new neuroscience technique and apply it to a research objective. Students must obtain prior approval from the graduate committee.

Precludes additional credit for PSYC 6204.

**NEUR 6302 [0.5 credit]****Techniques in Neuroscience II**

Completion of a research project carried out under the supervision of a neuroscience faculty member, normally not the current supervisor. The student will learn a new neuroscience technique and apply it to a research objective. Students must obtain prior approval from the graduate committee.

Precludes additional credit for PSYC 6204.

**NEUR 6401 [0.5 credit]****Independent Research in Neuroscience I**

Permission to register and approval of research plan must be obtained from the graduate committee. A final research report must be filed in the departmental office prior to submission of course grade.

Includes: Experiential Learning Activity

Precludes additional credit for PSYC 5901 and PSYC 6901.

**NEUR 6402 [0.5 credit]****Independent Research in Neuroscience II**

Permission to register and approval of research plan must be obtained from the graduate committee. A final research report must be filed in the departmental office prior to submission of course grade.

Includes: Experiential Learning Activity

Precludes additional credit for PSYC 5901 and PSYC 6901.

**NEUR 6501 [0.5 credit]****Directed Studies in Neuroscience I**

In-depth investigation of selected topics in neuroscience by means of directed library research. Registration is restricted, permission to register being granted only by the graduate committee. A final report must be filed in the departmental office prior to submission of course grade.

Precludes additional credit for PSYC 5900 and PSYC 6900.

**NEUR 6502 [0.5 credit]****Directed Studies in Neuroscience II**

In-depth investigation of selected topics in neuroscience by means of directed library research. Registration is restricted, permission to register being granted only by the graduate committee. A final report must be filed in the departmental office prior to submission of course grade.

Precludes additional credit for PSYC 5900 or PSYC 6900.

**NEUR 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Northern Studies

This section presents the requirements for programs in:

- **M.A. Northern Studies**
- **M.Sc. Northern Studies**
- **Graduate Diploma in Northern Studies**

### M.A. Northern Studies (5.0 credits)

#### Requirements:

<b>1. 2.0 credits in:</b>	<b>2.0</b>
NRTH 5000 [1.0]	Core Seminar: Northern Environments, Northern Societies, Northern Policy
NRTH 5001 [1.0]	Core Seminar: Northern and Arctic Issues
<b>2. 0.0 credit in:</b>	<b>0.0</b>
NRTH 5008 [0.0]	Introductory Northern Field Course
<b>3. 0.5 credit in:</b>	<b>0.5</b>
NRTH 5009 [0.5]	Field Course in Canada's North
<b>4. 1.0 credit in:</b>	<b>1.0</b>
NRTH 5901 [0.5]	Practicum in Northern Studies
NRTH 5905 [0.5]	Comprehensive Examination
<b>5. 0.5 credit from:</b>	<b>0.5</b>
GEOG 5003 [0.5]	Critical Approaches to Qualitative Inquiry
PECO 5001 [0.5]	Methodologies of Political Economy
SOCI 5105 [0.5]	Special Topics in Social Research
<b>6. 1.0 credit in</b>	<b>1.0</b>
additional course work chosen from the following list, or as approved by the program supervisor.	
ANTH 4610 [0.5]	Anthropology of Indigeneity
ANTH 5004 [0.5]	Ecological Anthropology
ANTH 5208 [0.5]	Anthropology of Indigeneity
CDNS 5101 [0.5]	Indigenous Peoples, Canada and the North
CDNS 5700 [0.5]	Arctic Passages: The Changing Dynamics of Canada's North
GEOG 5600 [0.5]	Empire and Colonialism
PADM 5224 [0.5]	Indigenous Policy
PADM 5614 [0.5]	Natural Resource Management
<b>Total Credits</b>	<b>5.0</b>

#### Notes:

1. Advanced standing may be granted for up to 1.0 credit for GEOG 5003, SOCI 5105, PECO 5001, GEOG 5001 or an approved course in research methods, and for other elective courses.
2. Up to 1.0 credit at the 4000-level may be selected, with the approval of the program.

### M.Sc. Northern Studies (5.0 credits)

#### Requirements:

<b>1. 2.0 credits in:</b>	<b>2.0</b>
NRTH 5000 [1.0]	Core Seminar: Northern Environments, Northern Societies, Northern Policy
NRTH 5001 [1.0]	Core Seminar: Northern and Arctic Issues
<b>2. 0.0 credit in:</b>	<b>0.0</b>
NRTH 5008 [0.0]	Introductory Northern Field Course

<b>3. 0.5 credit in:</b>	<b>0.5</b>
NRTH 5009 [0.5]	Field Course in Canada's North
<b>4. 1.0 credit in:</b>	<b>1.0</b>
NRTH 5901 [0.5]	Practicum in Northern Studies
NRTH 5905 [0.5]	Comprehensive Examination
<b>5. 0.5 credit in:</b>	<b>0.5</b>
GEOG 5001 [0.5]	Modeling Environmental Systems
<b>6. 1.0 credit in</b>	<b>1.0</b>
additional courses as listed below, or as approved by the program supervisor.	
GEOG 4013 [0.5]	Cold Region Hydrology
GEOG 4017 [0.5]	Global Biogeochemical Cycles
GEOG 4108 [0.5]	Permafrost
GEOG 5303 [0.5]	Geocryology
GEOG 5804 [0.5]	Geographic Information Systems

**Total Credits** **5.0**

#### Notes:

1. Advanced standing may be granted for up to 1.0 credit for GEOG 5003, SOCI 5105, PECO 5001, GEOG 5001 or an approved course in research methods, and for other elective courses.
2. Up to 1.0 credit at the 4000-level may be selected, with the approval of the program.

### Graduate Diploma in Northern Studies (3.0 credits)

#### Requirements (Type 2 and Type 3 Diplomas):

<b>1. 2.0 credits in:</b>	<b>2.0</b>
NRTH 5000 [1.0]	Core Seminar: Northern Environments, Northern Societies, Northern Policy
NRTH 5001 [1.0]	Core Seminar: Northern and Arctic Issues
<b>2. 0.0 credit in:</b>	<b>0.0</b>
NRTH 5008 [0.0]	Introductory Northern Field Course
<b>3. 0.5 credit from:</b>	<b>0.5</b>
GEOG 5003 [0.5]	Critical Approaches to Qualitative Inquiry
PECO 5001 [0.5]	Methodologies of Political Economy
SOCI 5105 [0.5]	Special Topics in Social Research
GEOG 5001 [0.5]	Modeling Environmental Systems
or another course in research methods approved by the Program Supervisor	
<b>4. 0.5 credit from:</b>	<b>0.5</b>
ANTH 4610 [0.5]	Anthropology of Indigeneity
ANTH 5004 [0.5]	Ecological Anthropology
ANTH 5208 [0.5]	Anthropology of Indigeneity
CDNS 5101 [0.5]	Indigenous Peoples, Canada and the North
CDNS 5700 [0.5]	Arctic Passages: The Changing Dynamics of Canada's North
GEOG 4013 [0.5]	Cold Region Hydrology
GEOG 4017 [0.5]	Global Biogeochemical Cycles
GEOG 4108 [0.5]	Permafrost
GEOG 5303 [0.5]	Geocryology
GEOG 5600 [0.5]	Empire and Colonialism
GEOG 5804 [0.5]	Geographic Information Systems
NRTH 5009 [0.5]	Field Course in Canada's North
PADM 5224 [0.5]	Indigenous Policy
PADM 5614 [0.5]	Natural Resource Management

A maximum of 1.0 credit may be taken at the 4000-level. No more than 0.5 credit may be taken as a Directed Study or Graduate Tutorial. Courses must be taken from at least three disciplines (as indicated by course prefixes).

**Total Credits** **3.0**

**Note:** advanced standing may be granted for up to 1.0 credit for GEOG 5003, SOCI 5105, PECO 5001, GEOG 5001 or an approved course in research methods, and for other elective courses.

## Regulations

See the General Regulations section of this Calendar.

Academic standing of B- or higher must be obtained in each course counted toward the fulfilment of the degree or diploma requirements.

## Admission

### M.A. and M.Sc. Northern Studies

The minimum requirement for admission to the M.A. or M.Sc. program in Northern Studies is normally an Honours degree (or four-year degree) with B+ standing. Customarily, applicants will have degrees in the environmental sciences, sociology, anthropology, political science, economics, geography, or a related field. Applicants with degrees in other disciplines, or without an honours degree, must demonstrate equivalent experience that may have prepared them for the program. Applicants must present a succinct 500-word statement indicating why they anticipate academic success in an interdisciplinary environment and outlining their motivation for taking this program.

### Diploma in Northern Studies (Type 2)

- Enrolment in a master's or doctoral degree program.
- Letter of support from the student's supervisor.
- A 500-word letter from the applicant outlining the reasons for wishing to enrol in the Diploma program, including comments on why they desire an interdisciplinary academic experience, why they expect to succeed in an interdisciplinary environment, and a proposed course schedule that will enable timely completion.

### Diploma in Northern Studies (Type 3)

- Honours or four-year degree with B+ standing. Customarily, applicants will have degrees in the environmental sciences, sociology, anthropology, political science, economics, geography, or a related field.
- Two letters of reference that indicate why the applicant is likely to succeed in the program. The referees must have a university degree, and preferably a graduate qualification.
- Applicants with degrees in other disciplines may present professional experience to supplement their academic record. In such cases, additional references may be requested as well as an interview with the applicant. Referees must have a university degree, and preferably a graduate qualification.

- A 500-word letter from the applicant outlining the reasons for wishing to enrol in the Diploma program, including comment on why they desire an interdisciplinary academic experience, why they expect to succeed in an interdisciplinary environment, and a proposed course schedule that will enable timely completion.

## Northern Studies (NRTN) Courses

### NRTN 5000 [1.0 credit]

#### Core Seminar: Northern Environments, Northern Societies, Northern Policy

Disciplinary perspectives on the biophysical, social, and policy environments of northern Canada. Resource development, devolution, local governance and sovereignty in a time of rapid environmental change. Prerequisite(s): NRTN 5008 or permission of the Northern Studies program supervisor.

### NRTN 5001 [1.0 credit]

#### Core Seminar: Northern and Arctic Issues

Research and evaluation using interdisciplinary perspectives on biophysical and social issues faced by northern Canadians. Topics will vary from year to year. Research activities may be in collaboration with northern agencies. Includes: Experiential Learning Activity. Prerequisite(s): NRTN 5000 (may be taken concurrently).

### NRTN 5008 [0.0 credit]

#### Introductory Northern Field Course

Overland field excursion to a northern community in the first week of the fall term or the week before the fall term. The course may last six days. Graded SAT/UNS. Includes: Experiential Learning Activity. Prerequisite(s): Enrolment in the first year of a Northern Studies program.

### NRTN 5009 [0.5 credit]

#### Field Course in Can. North

Field observation and methods in a selected region of northern Canada on a group basis. A supplementary fee will apply. Includes: Experiential Learning Activity. Prerequisite(s): NRTN 5000, NRTN 5001, NRTN 5008, NRTN 5905 (NRTN 5905 may be taken concurrently), and permission of the Northern Studies Supervisor. Field course to take place for two or three weeks in the summer.

**NRTH 5901 [0.5 credit]**  
**Practicum in Northern Studies**

Research activity under the supervision of professionals in museums, government departments, nongovernmental organizations, embassies, or another professional research setting. The research must be in Northern Studies. Graded SAT/UNS.

Includes: Experiential Learning Activity

Prerequisite(s): NRTH 5000 (may be taken concurrently) and permission of the Northern Studies supervisor.

**NRTH 5905 [0.5 credit]**  
**Comprehensive Examination**

This examination focuses on interdisciplinary approaches to resolution of biophysical, social, or policy problems with respect to northern Canada. A specific theme will be identified for each candidate. The exam will comprise a research paper, common language summary, interview, and oral presentation.

Prerequisite(s): NRTH 5000, NRTH 5001, or permission of the Northern Studies supervisor.

## Philanthropy and Nonprofit Leadership

This section presents the requirements for programs in:

- **Master of Philanthropy and Nonprofit Leadership**
- **Graduate Diploma in Philanthropy and Nonprofit Leadership**

### Program Requirements

#### Master of Philanthropy and Nonprofit Leadership (6.5 credits)

##### Requirements - Standard Admission:

<b>1. 3.5 credits in core courses:</b>	<b>3.5</b>
PANL 5001 [0.5]	Foundations of Philanthropy
PANL 5002 [0.5]	Policy and Legal Environment
PANL 5003 [0.5]	Finances for Philanthropy and the Nonprofit Sector
PANL 5004 [0.5]	Governance and Leadership
PANL 5005 [0.5]	Organizational Development
PANL 5006 [0.5]	Research Methods
PANL 5007 [0.5]	Policy and Program Evaluation
<b>2. 2.0 credits listed under Electives below, with at least 1.0 credit in PANL</b>	<b>2.0</b>
<b>3. 1.0 credit in:</b>	<b>1.0</b>
PANL 5010 [1.0]	Capstone Project
<b>Total Credits</b>	<b>6.5</b>

#### Master of Philanthropy and Nonprofit Leadership

#### (5.0 credits - Professional Entry)

##### Requirements - Professional Entry (5.0 credits)

<b>1. 3.5 credits in core courses:</b>	<b>3.5</b>
PANL 5001 [0.5]	Foundations of Philanthropy
PANL 5002 [0.5]	Policy and Legal Environment
PANL 5003 [0.5]	Finances for Philanthropy and the Nonprofit Sector
PANL 5004 [0.5]	Governance and Leadership
PANL 5005 [0.5]	Organizational Development
PANL 5006 [0.5]	Research Methods
PANL 5007 [0.5]	Policy and Program Evaluation
<b>2. 1.5 credits listed under Electives below, with at least 1.0 credit in PANL</b>	<b>1.5</b>
<b>Total Credits</b>	<b>5.0</b>

##### Electives

PANL 5009 [0.5]	Internship
PANL 5301 [0.5]	Planning and Management of Integrated Fundraising
PANL 5302 [0.5]	Responsible and Impact Investing
PANL 5303 [0.5]	Social Media, Communications and Marketing
PANL 5304 [0.5]	Strategic Philanthropy and Grantmaking for Social Change
PANL 5305 [0.5]	Globalization of Philanthropy
PANL 5306 [0.5]	Advanced Topics in Fundraising
PANL 5307 [0.5]	Community Philanthropy

PANL 5701 [0.5]	Social Innovation
PANL 5702 [0.5]	Social Entrepreneurship
PANL 5703 [0.5]	Public Policy Advocacy
PANL 5772 [0.5]	Special Topics in Philanthropy and Nonprofit Leadership
PANL 5791 [0.5]	Directed Studies in Philanthropy and Nonprofit Leadership

Other courses as approved by the PNL Supervisor

## Graduate Diploma in Philanthropy and Nonprofit Leadership (3.0 credits)

### Requirements:

Students must complete:

1. **1.0 credit in** required courses: 1.0

PANL 5001 [0.5]	Foundations of Philanthropy
PANL 5002 [0.5]	Policy and Legal Environment

2. **2.0 credits in** electives from: 2.0

PANL 5003 [0.5]	Finances for Philanthropy and the Nonprofit Sector
PANL 5004 [0.5]	Governance and Leadership
PANL 5005 [0.5]	Organizational Development
PANL 5006 [0.5]	Research Methods
PANL 5007 [0.5]	Policy and Program Evaluation
PANL 5301 [0.5]	Planning and Management of Integrated Fundraising
PANL 5302 [0.5]	Responsible and Impact Investing
PANL 5303 [0.5]	Social Media, Communications and Marketing
PANL 5304 [0.5]	Strategic Philanthropy and Grantmaking for Social Change
PANL 5305 [0.5]	Globalization of Philanthropy
PANL 5306 [0.5]	Advanced Topics in Fundraising
PANL 5307 [0.5]	Community Philanthropy
PANL 5701 [0.5]	Social Innovation
PANL 5702 [0.5]	Social Entrepreneurship
PANL 5703 [0.5]	Public Policy Advocacy
PANL 5772 [0.5]	Special Topics in Philanthropy and Nonprofit Leadership
PANL 5791 [0.5]	Directed Studies in Philanthropy and Nonprofit Leadership

Other courses as approved by PNL Supervisor

**Total Credits** 3.0

### Regulations

See the General Regulations section of this Calendar.

A grade of B- or higher must normally be obtained in each course credited towards the master's degree. A candidate may, with the recommendation of the MPNL Supervisor and the approval of the Dean of the Faculty of Graduate and Postdoctoral Affairs, be allowed a grade of C+ in courses totaling 0.5 credit.

### Admission

#### Master of Philanthropy and Nonprofit Leadership

The School of Public Policy and Administration provides two points of entry into the Master of Philanthropy and Nonprofit Leadership: a standard admission and a

professional entry that recognizes significant leadership experience.

Most applicants are considered for the standard admission into the 6.5 credit Master program. They must have an undergraduate or post-graduate degree (or equivalent) with an average of B+ or higher. The level of academic performance and potential as revealed through the degree is more important than the discipline. Students can enter the program from a variety of backgrounds, including the social sciences, humanities, and sciences.

The School also considers mid-career applicants for standard admission who do not satisfy this academic requirement, but who have demonstrated professional excellence over at least five years. Such applicants may use their high achievement in several designated university courses as evidence of their academic potential. These university courses are determined on an individual basis in consultation with the PNL Supervisor. Contact the School for details.

Applicants who have at least seven years of work experience in the philanthropic and nonprofit field over which they have exhibited significant leadership and increasing levels of responsibility are considered for entry into the limited number of spaces in the 5.0 credit professional Master program. In addition to such work experience, they must have an undergraduate degree or post-graduate degree (or equivalent) with an average of B+ or higher.

Students who seek admission to either the 6.5 or 5.0 credit Master program following satisfactory completion of the Diploma of Philanthropy and Nonprofit Leadership may, with permission of the PNL Supervisor, apply 2.0 of the Diploma credits toward the Masters.

All applicants whose first language is not English must demonstrate English proficiency in accordance with Section 3.6 of the General Regulations of this Calendar.

Students who have completed courses equivalent to the PANL courses or taken approved graduate courses on the recommendation of the PNL Graduate Supervisor, and obtained a grade of at least B+, may receive advanced standing with transfer of credit for up to 1.0 credit. This will be determined on an individual basis by consultation with the PNL Supervisor and the Vice Provost (Graduate Studies), pursuant to Section 6.1 of the General Regulations of this Calendar.

#### Graduate Diploma in Philanthropy and Nonprofit Leadership

Applicants must have a bachelor's degree (or equivalent). Normally, an average of B+ or higher is required for admission.

All applicants whose first language is not English must demonstrate English proficiency in accordance with Section 3.6 of the Graduate Calendar.

**Note:** students in the Diploma programs are not eligible to receive university funding.

## **Philanthropy and Nonprofit Leadership (PANL) Courses**

### **PANL 5001 [0.5 credit]**

#### **Foundations of Philanthropy**

The motivations, values and ethics, and history of philanthropy, and a critical examination of its role in relation to government, business and society. Trends and emerging challenges in philanthropy and voluntary action over time and in different cultures and regions.

### **PANL 5002 [0.5 credit]**

#### **Policy and Legal Environment**

The legal, tax and regulatory context in which philanthropy, charities and nonprofits operate; the processes of policy formation and means of participating in them.

### **PANL 5003 [0.5 credit]**

#### **Finances for Philanthropy and the Nonprofit Sector**

Revenue source development, business planning, financial management and accountability covering a range of financing options.

### **PANL 5004 [0.5 credit]**

#### **Governance and Leadership**

Theories of leadership, ethical decision making, and the function of governance, boards and strategic planning in directing effective sustainable organizations, building external relationships and managing multiple accountabilities.

### **PANL 5005 [0.5 credit]**

#### **Organizational Development**

Theories and application of organizational development for nonprofit and philanthropic organizations; human resource management for staff and volunteers, control systems, and project and risk management.

### **PANL 5006 [0.5 credit]**

#### **Research Methods**

Understanding of qualitative and quantitative methods with application to philanthropy and nonprofit research. Topics may include research design, techniques for collecting and managing evidence, an introduction to qualitative and statistical analysis and communication of results.

### **PANL 5007 [0.5 credit]**

#### **Policy and Program Evaluation**

Selected concepts, issues and processes in applied planning and evaluation, utilizing both Canadian and comparative experiences.

### **PANL 5009 [0.5 credit]**

#### **Internship**

This course requires supervised work experience over 10 weeks in an appropriate placement approved by the graduate supervisor. It culminates in a 25-30 page (or equivalent) analytical work graded by the academic supervisor.

Includes: Experiential Learning Activity

### **PANL 5010 [1.0 credit]**

#### **Capstone Project**

An integrative research project on a topic related to the philanthropic or nonprofit sector.

Includes: Experiential Learning Activity

Prerequisite(s): completion of core courses.

### **PANL 5301 [0.5 credit]**

#### **Planning and Management of Integrated Fundraising**

Strategic and tactical management, oversight and ethical considerations of a diversity of fundraising methods; donor relationships; planning and managing integrated campaigns.

### **PANL 5302 [0.5 credit]**

#### **Responsible and Impact Investing**

The financial instruments, organizational implications and measurement of program-related and other investments that lever economic, social and environmental value by organizations in or straddling the nonprofit and for-profit sectors.

### **PANL 5303 [0.5 credit]**

#### **Social Media, Communications and Marketing**

The use of social media and other information technologies for brand building, marketing, fundraising, and social/political activism. An overview of marketing and communications theory, principles and techniques, and their application in philanthropic, nonprofit, and social entrepreneurial environments.

### **PANL 5304 [0.5 credit]**

#### **Strategic Philanthropy and Grantmaking for Social Change**

Alternative approaches to effective grantmaking and funding practices, including managing the associated accountabilities for both grantmaking bodies and recipient organizations.

### **PANL 5305 [0.5 credit]**

#### **Globalization of Philanthropy**

Understanding global civil society and the effects that globalization has on giving and organizing. The legal, regulatory and cultural considerations for philanthropy, volunteerism, and civil society organizations that work transnationally.

**PANL 5306 [0.5 credit]****Advanced Topics in Fundraising**

Specialized aspects and advanced methods of fundraising including planned giving, major campaigns, new technologies, ethical issues and leadership skills.

Prerequisite(s): PANL 5301 or permission of the Philanthropy and Nonprofit Leadership graduate supervisor.

Online course.

**PANL 5307 [0.5 credit]****Community Philanthropy**

Formal and informal mechanisms communities use to mobilize their assets for public benefit and social change; analysis of major innovations and trends in community philanthropy from a global perspective.

Online

**PANL 5701 [0.5 credit]****Social Innovation**

The processes, business models and leadership of 'social innovation' – system changing approaches to dealing with social, cultural, economic and environmental challenges.

Use of case studies and prototypes to test assumptions and alternatives.

Includes: Experiential Learning Activity

**PANL 5702 [0.5 credit]****Social Entrepreneurship**

The theory, leadership and management of social entrepreneurship, from evaluating the opportunity through implementation. Includes assessment of startup strategies, raising funds, assessing risks, legal aspects, marketing ideas, managing resources and growth, and creation of socially responsible models.

**PANL 5703 [0.5 credit]****Public Policy Advocacy**

Examination of how nonprofit organizations and voluntary action can affect social change and influence public policy processes in both national and international contexts.

Practical development of advocacy and public education strategies.

**PANL 5772 [0.5 credit]****Special Topics in Philanthropy and Nonprofit Leadership**

One or more specialized or advanced aspects of philanthropy and nonprofit leadership such as the ethics, history, cross-cultural dimensions and management of particular types of organizations. The topics will change each year.

**PANL 5791 [0.5 credit]****Directed Studies in Philanthropy and Nonprofit Leadership**

A directed reading course on selected subjects related to philanthropy and nonprofit leadership, as arranged with a faculty supervisor.

Prerequisite(s): PANL 5001 and PANL 5002, at least an A- average in PANL courses, and permission of the Philanthropy and Nonprofit Leadership supervisor.

# Philosophy

This section presents the requirements for programs in:

- **M.A. Philosophy**
- **M.A. Philosophy with Collaborative Specialization in Digital Humanities**

## Program Requirements

### M.A. Philosophy (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
PHIL 5850 [0.5]	Proseminar
PHIL 5900 [0.5]	Research Seminar
<b>2. 2.0 credits in:</b>	2.0
PHIL 5909 [2.0]	M.A. Thesis (must be defended at an oral examination)
<b>3. 2.0 credits in courses, subject to the following limitations:</b>	2.0
They may include one, but not both of the following:	
PHIL 5701 [0.5]	Fall Colloquium
or	
PHIL 5751 [0.5]	Winter Colloquium
They may include up to 1.0 credit from:	
PHIL 5000 [0.5]	Special Topic in Philosophy
PHIL 5200 [0.5]	Topics in Philosophy of Mind or Philosophy of Language
PHIL 5250 [0.5]	Topics in Logic, Epistemology, Metaphysics or Philosophy of Science
PHIL 5300 [0.5]	Topics in Value Theory
PHIL 5350 [0.5]	Topics in Ethics or Political Philosophy
PHIL 5500 [0.5]	Topics in Contemporary Philosophy
PHIL 5600 [0.5]	Topics in the History of Philosophy
PHIL 5650 [0.5]	Semantics
PHIL 5660 [0.5]	Lexical Semantics
or, with permission of the department other approved courses at the graduate or 4000-level at Carleton or other universities	
They may include up to 1.0 credit in tutorials or, with permission of the department, approved graduate-only courses at the graduate level in other departments or at other universities	
They must include at least 0.5 credit in two of the following areas of study:	
History of Philosophy	
Philosophy of mind, philosophy of language, logic, epistemology, or metaphysics	
Moral, social, or political philosophy	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
PHIL 5850 [0.5]	Proseminar
PHIL 5900 [0.5]	Research Seminar
<b>2. 1.0 credit in:</b>	1.0
PHIL 5908 [1.0]	Research Essay
<b>3. 1.0 credit from:</b>	1.0
PHIL 5701 [0.5]	Fall Colloquium

PHIL 5751 [0.5]	Winter Colloquium
or, with the permission of the department, approved graduate-level courses in other departments or at other universities	
<b>4. Up to 1.0 credit from:</b>	1.0
PHIL 5000 [0.5]	Special Topic in Philosophy
PHIL 5200 [0.5]	Topics in Philosophy of Mind or Philosophy of Language
PHIL 5250 [0.5]	Topics in Logic, Epistemology, Metaphysics or Philosophy of Science
PHIL 5300 [0.5]	Topics in Value Theory
PHIL 5350 [0.5]	Topics in Ethics or Political Philosophy
PHIL 5500 [0.5]	Topics in Contemporary Philosophy
PHIL 5600 [0.5]	Topics in the History of Philosophy
PHIL 5650 [0.5]	Semantics
PHIL 5660 [0.5]	Lexical Semantics
or, with permission of the department, approved courses at graduate or 4000-level at Carleton or other universities	
<b>5. Up to 1.0 credit in tutorials, or, with permission of the department, approved graduate-level courses in other departments or at other universities</b>	<b>1.0</b>
Courses chosen must include at least 0.5 credit in two of the following areas of study:	
History and philosophy	
Philosophy of mind, philosophy of language, logic, epistemology, or metaphysics	
Moral, social, or political philosophy	
<b>Total Credits</b>	<b>5.0</b>

### M.A. Philosophy with Collaborative Specialization in Digital Humanities (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
PHIL 5850 [0.5]	Proseminar
PHIL 5900 [0.5]	Research Seminar
<b>2. 2.0 credits in:</b>	2.0
PHIL 5909 [2.0]	M.A. Thesis (in the specialization)
<b>3. 1.0 credits in courses, subject to the following limitations:</b>	1.0
- They may include PHIL 5701 or PHIL 5751 but not both	
- They may include up to 0.5 credit from PHIL 5000, PHIL 5200, PHIL 5250, PHIL 5300, PHIL 5350, PHIL 5500, PHIL 5600, PHIL 5650, PHIL 5660, or, with permission of the department, other approved courses at the graduate or 4000-level at Carleton or other universities	
- They may include up to 0.5 credit in tutorials, or, with permission of the department, approved graduate-only courses at the graduate level in other departments or at other universities	
- They must include at least 0.5 credit in two of the following areas of study: history of philosophy, philosophy of mind, philosophy of language, logic, epistemology, or metaphysics, moral, social, or political philosophy	
<b>4. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>5. 0.5 credit in DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)</b>	<b>0.5</b>

<b>6. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0] Digital Humanities: Professional Development	

**Total Credits 5.0**

#### Requirements - Research essay pathway (5.0 credits)

**1. 1.0 credit in:** 1.0

PHIL 5850 [0.5] Proseminar	
PHIL 5900 [0.5] Research Seminar	

**2. 1.0 credit in:** 1.0

PHIL 5908 [1.0] Research Essay (in the specialization)	
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**3. 1.0 credit from:** 1.0

PHIL 5701 [0.5] Fall Colloquium	
PHIL 5751 [0.5] Winter Colloquium	

Or, with permission of the department, approved graduate-level courses in other departments or at other universities

**4. 1.0 credit from:** 1.0

PHIL 5000 [0.5] Special Topic in Philosophy	
PHIL 5200 [0.5] Topics in Philosophy of Mind or Philosophy of Language	

PHIL 5250 [0.5] Topics in Logic, Epistemology, Metaphysics or Philosophy of Science	
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PHIL 5300 [0.5] Topics in Value Theory	
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PHIL 5350 [0.5] Topics in Ethics or Political Philosophy	
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PHIL 5500 [0.5] Topics in Contemporary Philosophy	
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PHIL 5600 [0.5] Topics in the History of Philosophy	
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PHIL 5650 [0.5] Semantics	
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PHIL 5660 [0.5] Lexical Semantics	
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Or, with permission of the department, approved courses at graduate or 4000-level at Carleton or other universities

**5. 0.5 credit in DIGH 5000** 0.5

**6. 0.5 credit in DIGH (DIGH 5011, DIGH 5012, or annually listed DIGH course)** 0.5

**7. 0.0 credit in:**

DIGH 5800 [0.0] Digital Humanities: Professional Development	
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**Total Credits 5.0**

#### Course Selection

##### Special Topics

PHIL 5000 [0.5] Special Topic in Philosophy	
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##### Tutorials

PHIL 5004 [0.5] Tutorial in the History of Philosophy I	
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PHIL 5005 [0.5] Tutorial in the History of Philosophy II	
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PHIL 5104 [0.5] Tutorial in the Work of an Individual Philosopher I	
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PHIL 5105 [0.5] Tutorial in the Work of an Individual Philosopher II	
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PHIL 5204 [0.5] Tutorial in Logic, Epistemology, or Metaphysics I	
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PHIL 5205 [0.5] Tutorial in Logic, Epistemology, or Metaphysics II	
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PHIL 5304 [0.5] Tutorial in Selected Problems of Philosophy I	
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PHIL 5305 [0.5] Tutorial in Selected Problems of Philosophy II	
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##### Colloquia

PHIL 5701 [0.5] Fall Colloquium	
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PHIL 5751 [0.5] Winter Colloquium	
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##### Seminars

PHIL 5200 [0.5] Topics in Philosophy of Mind or Philosophy of Language	
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PHIL 5250 [0.5] Topics in Logic, Epistemology, Metaphysics or Philosophy of Science	
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PHIL 5300 [0.5] Topics in Value Theory	
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PHIL 5350 [0.5] Topics in Ethics or Political Philosophy	
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PHIL 5500 [0.5] Topics in Contemporary Philosophy	
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PHIL 5600 [0.5] Topics in the History of Philosophy	
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PHIL 5650 [0.5] Semantics	
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PHIL 5660 [0.5] Lexical Semantics	
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PHIL 5850 [0.5] Proseminar	
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PHIL 5900 [0.5] Research Seminar	
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PHIL 5908 [1.0] Research Essay	
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PHIL 5909 [2.0] M.A. Thesis	
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#### Regulations

See the General Regulations section of this Calendar.

#### Guidelines for Completion of Master's Degree

Full-time students enrolled in the 5.0-credit M.A. program are expected to complete PHIL 5850, PHIL 5900 and 2.0 further credits by the end of the second term of study.

The thesis or research essay approval form should be submitted by the end of the fourth week of the third term of study. All full-time students are expected to submit the thesis or research essay by the end of the fourth term of study.

Part-time students enrolled in the 5.0 credit M.A. program are expected to complete PHIL 5850, PHIL 5900 and 2.0 further credits by the end of the third year of study.

The thesis or research essay approval form should be submitted by the end of the second month of the fourth year of study. All part-time students are expected to submit the thesis or research essay by the end of the fifth year of study.

#### Admission

The minimum requirement for admission to the master's program is a B.A. Honours degree (or the equivalent) in Philosophy, with at least B+ standing (or the equivalent).

Students who have not successfully completed an introductory logic course in philosophy (equivalent to Carleton's PHIL 2001) at the time of their application will be required to complete PHIL 2001 (or an equivalent) successfully prior to registration or as part of their first year of study. If required, completion of a logic course is extra to the degree requirements.

Qualifying-year and M.A. applicants from an institution other than Carleton University must submit two papers.

**Qualifying Year**

Applicants who do not hold an Honours degree (or the equivalent) will be required to register in a qualifying-year program before proceeding to the master's program. Regulations governing the qualifying year are outlined in the General Regulations section of this Calendar.

**Philosophy (PHIL) Courses****PHIL 5000 [0.5 credit]****Special Topic in Philosophy**

A detailed study of a special topic in philosophy. Topics may vary from year to year.  
Also offered at the undergraduate level, with different requirements, as PHIL 4100, for which additional credit is precluded.

**PHIL 5004 [0.5 credit]****Tutorial in the History of Philosophy I**

Detailed study of a period or issue in the history of philosophy.

**PHIL 5005 [0.5 credit]****Tutorial in the History of Philosophy II**

Detailed study of a period or issue in the history of philosophy.

**PHIL 5104 [0.5 credit]****Tutorial in the Work of an Individual Philosopher I**

A critical and systematic study of the work of an individual philosopher.

**PHIL 5105 [0.5 credit]****Tutorial in the Work of an Individual Philosopher II**

A critical and systematic study of the work of an individual philosopher.

**PHIL 5200 [0.5 credit]****Topics in Philosophy of Mind or Philosophy of Language**

A detailed study of an issue or the work of selected philosophers in the general area of philosophy of mind and/or philosophy of language. Topics may vary from year to year.  
Also offered at the undergraduate level, with different requirements, as PHIL 4210 or PHIL 4220, for which additional credit is precluded.

**PHIL 5204 [0.5 credit]****Tutorial in Logic, Epistemology, or Metaphysics I**

An attempt to find a solution to a specific problem in logic, epistemology, or metaphysics.

**PHIL 5205 [0.5 credit]****Tutorial in Logic, Epistemology, or Metaphysics II**

An attempt to find a solution to a specific problem in logic, epistemology, or metaphysics.

**PHIL 5250 [0.5 credit]****Topics in Logic, Epistemology, Metaphysics or Philosophy of Science**

A detailed study of an issue or the work of selected philosophers in the general areas of logic, epistemology, metaphysics or philosophy of science. Topics may vary from year to year.  
Also offered at the undergraduate level, with different requirements, as PHIL 4230, for which additional credit is precluded.

**PHIL 5300 [0.5 credit]****Topics in Value Theory**

A detailed study of an issue or the work of selected philosophers in the general area of value theory. Topics may vary from year to year.  
Also offered at the undergraduate level, with different requirements, as PHIL 4300, for which additional credit is precluded.

**PHIL 5304 [0.5 credit]****Tutorial in Selected Problems of Philosophy I**

An attempt to find a solution to a specific problem in some area other than logic, epistemology, or metaphysics.

**PHIL 5305 [0.5 credit]****Tutorial in Selected Problems of Philosophy II**

An attempt to find a solution to a specific problem in some area other than logic, epistemology, or metaphysics.

**PHIL 5350 [0.5 credit]****Topics in Ethics or Political Philosophy**

A detailed study of an issue or the work of selected philosophers in the general areas of ethics or political philosophy. Topics may vary from year to year.  
Also offered at the undergraduate level, with different requirements, as PHIL 4320 or PHIL 4330, for which additional credit is precluded.

**PHIL 5500 [0.5 credit]****Topics in Contemporary Philosophy**

A detailed study of an issue or the work of selected philosophers in contemporary philosophy. Topics may vary from year to year.

Also offered at the undergraduate level, with different requirements, as PHIL 4007 or PHIL 4008, for which additional credit is precluded.

**PHIL 5600 [0.5 credit]****Topics in the History of Philosophy**

A detailed study within the history of philosophy: a period, an issue or the work of selected philosophers. Topics may vary from year to year.

Also offered at the undergraduate level, with different requirements, as PHIL 4003, PHIL 4004, PHIL 4005, or PHIL 4006, for which additional credit is precluded.

**PHIL 5650 [0.5 credit]****Semantics**

A graduate seminar in contemporary semantics.

Also listed as LING 5505.

**PHIL 5660 [0.5 credit]****Lexical Semantics**

Study of the meaning of words. Topics may include lexical decomposition, meaning variation, lexical relations, and lexical aspect.

Also listed as LING 5510.

Also offered at the undergraduate level, with different requirements, as LING 4510 and PHIL 4055, for which additional credit is precluded.

**PHIL 5701 [0.5 credit]****Fall Colloquium**

Students attend each talk in the departmental colloquium series, preparing by doing mandatory background readings, and submit in writing a critical analysis of some aspect of the presentation.

Precludes additional credit for PHIL 5700 (no longer offered).

**PHIL 5751 [0.5 credit]****Winter Colloquium**

Students attend each talk in the departmental colloquium series, preparing by doing mandatory background readings, and submit in writing a critical analysis of some aspect of the presentation.

Precludes additional credit for PHIL 5750 (no longer offered).

**PHIL 5850 [0.5 credit]****Proseminar**

Students in this seminar will engage with contemporary philosophical research by exploring relations and interactions between two broad fields: philosophy of mind, language, and knowledge; and moral, social, and political philosophy. Specific topics will vary from year to year.

**PHIL 5900 [0.5 credit]****Research Seminar**

Students select a contemporary philosophical position or historical interpretation and the surrounding debate in the philosophical or scholarly literature upon which to base a thesis proposal using literature review and an essay.

Includes: Experiential Learning Activity

**PHIL 5908 [1.0 credit]****Research Essay**

Includes: Experiential Learning Activity

**PHIL 5909 [2.0 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

# Physics

This section presents the requirements for programs in:

- **M.Sc. Physics - Particle Physics Stream**
- **M.Sc. Physics - Medical Physics Stream**
- **M.Sc. Physics - Physics in Modern Technology Stream**
- **M.Sc. Physics Medical Physics Stream with Collaborative Specialization in Data Science**
- **M.Sc. Physics Particle Physics Stream with Collaborative Specialization in Data Science**
- **Ph.D. Physics**

## Program Requirements

### M.Sc. Physics - Particle Physics Stream (5.0 credits):

#### Requirements - Particle Physics Stream:

<b>1. 2.0 credits in:</b>	<b>2.0</b>
PHYS 5601 [0.5]	Experimental Techniques of Nuclear and Elementary Particle Physics
PHYS 5602 [0.5]	Physics of Elementary Particles
PHYS 5701 [0.5]	Intermediate Quantum Mechanics with Applications
PHYS 5702 [0.5]	Relativistic Quantum Mechanics
<b>2. 0.5 credit in:</b>	<b>0.5</b>
PHYS 5002 [0.5]	Statistical Data Analysis Techniques for Physics (or equivalent course in computing physics)
<b>3. 2.5 credits in:</b>	<b>2.5</b>
PHYS 5909 [2.5]	M.Sc. Thesis (defended at an oral examination)
4. Participation in the seminar series of the Ottawa-Carleton Institute of Physics	
<b>Total Credits</b>	<b>5.0</b>

#### Notes:

1. Of the 2.5 credits of course work, no more than 1.5 credits may be fulfilled by Selected Topics such as PHYS 5900 [1.0], PHYS 5901 [0.5]. In special cases, the requirements may also be met by taking 5.0 credits of course work. 1.0 credit must be the Selected Topics course PHYS 5900

### M.Sc. Physics - Medical Physics Stream (5.0 credits):

#### Requirements - Medical Physics Stream:

<b>1. 0.5 credit in:</b>	<b>0.5</b>
PHYS 5203 [0.5]	Medical Radiation Physics
<b>2. 0.5 credit in:</b>	<b>0.5</b>
PHYS 5002 [0.5]	Statistical Data Analysis Techniques for Physics (or equivalent course in computing physics)
<b>3. 0.5 credit from:</b>	<b>0.5</b>
PHYS 5204 [0.5]	Physics of Medical Imaging (for imaging)
PHYS 5206 [0.5]	Medical Radiotherapy Physics (for therapy)

PHYS 5207 [0.5]	Radiobiology (for biophysics)	
<b>4. 0.5 credit in</b>	PHYS 5208 or an appropriate physics course from an area of physics outside medical physics, chosen from PHYS or PHYJ.	<b>0.5</b>
<b>5. 0.5 credit in</b>	PHYS or PHYJ. With approval of the graduate supervisor, an appropriate graduate-level course outside the department of physics can be used.	<b>0.5</b>
<b>6. 2.5 credits in:</b>		<b>2.5</b>
PHYS 5909 [2.5]	M.Sc. Thesis (defended at an oral examination)	
7. Participation in the seminar series of the Ottawa-Carleton Institute for Physics		
<b>Total Credits</b>		<b>5.0</b>

#### Notes:

1. Of the 2.5 credits of course work, no more than 1.5 credits may be fulfilled by Selected Topics such as PHYS 5900 [1.0], PHYS 5901 [0.5]. In special cases, the requirements may also be met by taking 5.0 credits of course work. 1.0 credit must be the Selected Topics course PHYS 5900 [1.0].

### M.Sc. Physics - Physics in Modern Technology Stream (4.0 credits):

#### Requirements - Physics in Modern Technology Stream:

<b>1. 1.0 credit from:</b>		<b>1.0</b>
PHYS 5002 [0.5]	Statistical Data Analysis Techniques for Physics	
PHYJ 5003 [0.5]	Computer Simulations in Physics	
PHYJ 5004 [0.5]	Computational Physics: Deterministic Methods	
PHYJ 5005 [0.5]	Computational Physics: Stochastic Methods	
<b>2. 2.0 credits in PHYS or PHYJ. With approval of the graduate supervisor, an appropriate graduate-level course outside the department of physics can be used.</b>		<b>2.0</b>
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PHYS 5905 [1.0]	Physics in Modern Technology Work Term	
<b>Total Credits</b>		<b>4.0</b>

#### Note:

Students enrolled in the physics in modern technology stream are required to complete a work term rather than a research thesis. Students in this stream who wish to pursue a research degree should consult with the graduate supervisor. Although every effort is made to find a work term position for every student enrolled in the physics in modern technology stream, no guarantee of employment can be made. To minimize the likelihood of a work term position not being found, enrollment will be limited to reflect the availability of work term placements. In the event that a work term placement cannot be found, students may fulfill the M.Sc. requirements with 4.0 credits of course work.

#### Guidelines for Completion of Master's Degree

With the exception of those students in the physics in modern technology stream, full-time master's candidates are expected to complete all requirements in six terms of registered full-time study. Part-time master's candidates

are expected to complete their degree requirements within an elapsed period of three to four calendar years after the date of initial registration.

Students in the physics in modern technology stream are normally expected to complete all their requirements in three successive terms of registered full-time study.

### M.Sc. Physics

#### Medical Physics Stream with Collaborative Specialization in Data Science (5.0 credits)

##### Requirements:

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 0.5 credit in:</b>	0.5
PHYS 5002 [0.5]	Statistical Data Analysis Techniques for Physics (or equivalent course in computing physics)
<b>3. 0.5 credit in:</b>	0.5
PHYS 5203 [0.5]	Medical Radiation Physics
<b>4. 0.5 credits from:</b>	0.5
PHYS 5204 [0.5]	Physics of Medical Imaging (for imaging)
PHYS 5206 [0.5]	Medical Radiotherapy Physics (for therapy)
PHYS 5207 [0.5]	Radiobiology (for biophysics)
<b>5. 0.5 credit in PHYS or PHYJ.</b> With approval of the graduate supervisor, an appropriate graduate-level course outside the department of physics can be used.	0.5
<b>6. 2.5 credits in</b>	2.5
PHYS 5909 [2.5]	M.Sc. Thesis (on a data science topic approved by the Data Science governance committee and defended at an oral examination)
7. Participation in the seminar series of the Ottawa-Carleton Institute for Physics	

**Total Credits** 5.0

### M.Sc. Physics

#### Particle Physics Stream with Collaborative Specialization in Data Science (5.0 credits)

##### Requirements:

<b>1. 0.5 credit in:</b>	0.5
DATA 5000 [0.5]	Introduction to Data Science
<b>2. 0.5 credit in:</b>	0.5
PHYS 5002 [0.5]	Statistical Data Analysis Techniques for Physics (or equivalent course in computing physics)
<b>3. 1.5 credit in:</b>	1.5
PHYS 5602 [0.5]	Physics of Elementary Particles
PHYS 5701 [0.5]	Intermediate Quantum Mechanics with Applications
PHYS 5702 [0.5]	Relativistic Quantum Mechanics
<b>4. 2.5 credits in:</b>	2.5
PHYS 5909 [2.5]	M.Sc. Thesis (on a data science topic approved by the Data Science governance committee and defended at an oral examination)

5. Participation in the seminar series of the Ottawa-Carleton Institute of Physics

**Total Credits** 5.0

### Ph.D. Physics (2.0 credits)

##### Requirements:

<b>1. 2.0 credits in course work at the graduate level</b>	2.0
2. Comprehensive examination designed to demonstrate overall ability in physics and in the candidate's research area, normally within the first year of study. This takes the form of a written examination followed, if necessary, by an oral examination	
3. Participation in the seminar series of the Ottawa-Carleton Institute for Physics	
<b>4. 0.0 credits in:</b>	0.0
PHYS 6909 [0.0]	Ph.D. Thesis (which will be defended at an oral examination. The examining board for all theses will include members of the Ottawa-Carleton Institute for Physics from both Departments of Physics. The external examiner of the thesis will be external to both Departments of Physics.)

**Total Credits** 2.0

##### Notes

- Students in experimental or theoretical particle physics who lack any of the relevant courses recommended for the M.Sc. program must complete them (or the equivalents) by the end of their Ph.D. program. In addition they should complete PHYS 6601 and PHYS 6602

- Students in medical physics must have completed, either within this degree (as part of the minimum 2.0 course credits) or in prior graduate studies:

PHYS 5203 [0.5]	Medical Radiation Physics (or equivalent)
PHYS 5204 [0.5]	Physics of Medical Imaging (or equivalent)
PHYS 5206 [0.5]	Medical Radiotherapy Physics (or equivalent)
PHYS 5207 [0.5]	Radiobiology (or equivalent)
PHYS 5208 [0.5]	Radiation Protection (or equivalent)
PHYS 5209 [0.5]	Medical Physics Practical Measurements (or equivalent)
PHYS 5210 [0.0]	Anatomy and Physiology for Medical Physicists (or equivalent)

- In addition it is also strongly recommended to have completed 0.5 credit in a computational physics course, such as PHYS 5002, within the minimum 2.0 credits of this degree or in prior graduate studies.

- Irrespective of courses taken previously at another institution, students may be required to complete one or more of PHYS 5204, PHYS 5206, or PHYS 5207 as preparation for their thesis research.

- Students must satisfy Physics Department requirements for extent and breadth of participation in workshops on professionalism and ethics as a medical physicist.

## **Guidelines for Completion of Doctoral Degree**

Full-time Ph.D. candidates admitted on the basis of an M.Sc. are expected to complete all requirements within an elapsed period of four to five years after the date of initial registration. Part-time Ph.D. candidates are expected to complete all requirements within an elapsed period of six years after the date of initial registration.

## **Residence Requirements**

For the Ph.D. degree (from B.Sc.): at least three years of full-time study (or equivalent).

For the Ph.D. degree (from M.Sc.): at least two years of full-time study (or equivalent).

## **Regulations**

See the General Regulations section of this Calendar.

## **Admission**

An Honours B.Sc. in Physics or a closely related field at a standard acceptable to the two universities is normally required for admission to the M.Sc. program.

The admissions committee may require students to take an orientation examination during the first weeks of residence. The results of this examination may indicate the need for a student to register in undergraduate courses to fill gaps in his/her knowledge.

It is strongly recommended that all students have had at least one course in computing.

Candidates admitted to the M.Sc. program with more than the minimum course requirements may be permitted to credit towards the degree a maximum of 1.0 credit at the senior undergraduate level. This maximum does not apply to qualifying-year students.

For the M.Sc. Physics – Medical Physics Stream, students with a medical/health physics background may have the selection of required courses adjusted to reflect their preparation and may receive advanced standing for equivalent courses.

## **Accelerated Pathway**

The accelerated pathway in the Department of Physics is a flexible and individualized plan of graduate study. Students in their final year of a Carleton B.Sc. Honours degree in Physics with demonstrated excellent aptitude for research may qualify for this option.

Students in their third-year of study in the B.Sc. Honours degree in Physics should consult with both the Undergraduate Advisor and the Graduate Advisor to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses and Honours project supervisor for their final year of undergraduate studies.

Particle physics accelerated pathway: students must complete PHYS 5002 Computational Physics and PHYS 5602 Physics of Elementary Particles with a grade of B+ or higher in each.

Medical physics accelerated pathway: students must complete PHYS 5002 Computational Physics and

PHYS 5313 Physical Applications of Fourier Analysis with a grade of B+ or higher in each.

Students may receive advanced standing with transfer of credit of up to 1.0 credit which will reduce their time to completion.

## **Admission**

An M.Sc. in Physics or a closely related field is normally required for admission into the Ph.D. program.

Students who have been admitted to the M.Sc. program may be permitted to transfer into the Ph.D. program if they demonstrate academic abilities for advanced research in their field.

In exceptional cases, an outstanding student who has completed the honours B.Sc. will be considered.

## **Physics (PHYS) Courses**

With the exception of PHYS 5701 Intermediate Quantum Mechanics with Applications and PHYS 5302 Classical Electrodynamics, which may be offered at either Carleton or the University of Ottawa, all PHYS courses are offered only at Carleton, and all PHYJ courses are offered only at the University of Ottawa.

### **PHYS 5002 [0.5 credit] (PHY 5344)**

#### **Statistical Data Analysis Techniques for Physics**

Computational methods used in analysis of experimental data. Introduction to probability and random variables. Monte Carlo methods for simulation of random processes. Statistical methods for parameter estimation and hypothesis tests. Confidence intervals. Multivariate data classification. Unfolding methods. Examples taken primarily from particle and medical physics.

Includes: Experiential Learning Activity

Prerequisite(s): an ability to program in Python, Java, C, or C++, and permission of the Department.

Also offered at the undergraduate level, with different requirements, as PHYS 4807, for which additional credit is precluded.

### **PHYS 5101 [0.5 credit] (PHY 8111)**

#### **Classical Mechanics and Theory of Fields**

Hamilton's principle; conservation laws; canonical transformations; Hamilton-Jacobi theory; Lagrangian formulation of classical field theory.

Prerequisite(s): permission of the Department.

### **PHYS 5201 [0.5 credit]**

#### **Introduction to Medical Imaging Principles and Technology**

Basic principles and technological implementation of x-ray, nuclear medicine, magnetic resonance imaging (MRI), and other imaging modalities used in medicine. Contrast, resolution, storage requirements for digital images. Applications outside of medicine, future trends. Precludes additional credit for BIOM 5201.

Prerequisite(s): permission of the Physics Department.

**PHYS 5202 [0.5 credit] (PHY 8122)****Special Topics in Molecular Spectroscopy**

Topics may include: electronic spectra of diatomic and triatomic molecules and their interpretation using molecular orbital diagrams; Raman and resonance Raman spectroscopy; symmetry aspects of vibrational and electronic levels of ions and molecules in solids; the presence of weak and strong resonant laser radiation.

Prerequisite(s): permission of the Department.

**PHYS 5203 [0.5 credit] (PHY 5161)****Medical Radiation Physics**

Interaction of electromagnetic radiation with matter.

Sources: X-ray, accelerators, radionuclide. Charged particle interaction mechanisms, stopping powers, kerma, dose. Introduction to dosimetry. Units, measurements, dosimetry devices.

Prerequisite(s): permission of the Department.

**PHYS 5204 [0.5 credit] (PHY 5112)****Physics of Medical Imaging**

Physical foundation of and recent developments in transmission X-ray imaging, computerized tomography, nuclear medicine, magnetic resonance imaging, and ultrasound, for the specialist imaging physicist. Image quality, contrast, resolution, SNR, MTF, DQE. Introduction to image processing, system performance assessment.

Includes: Experiential Learning Activity

Prerequisite(s): PHYS 5203 and one of PHYS 4203 or PHYS 5313, or permission of the Department.

**PHYS 5206 [0.5 credit] (PHY 5164)****Medical Radiotherapy Physics**

Radiation therapy process and physics. Ion chamber dosimetry, Monte Carlo techniques of radiation transport, cavity theories, external beam therapy, brachytherapy, dosimetry protocols, detectors used in radiation therapy. Treatment planning, monitor unit calculations, intensity-modulated radiation therapy. Novel and alternate techniques.

Includes: Experiential Learning Activity

Prerequisite(s): PHYS 5203 or permission of the Department.

**PHYS 5207 [0.5 credit] (PHY 5165)****Radiobiology**

Physics and chemistry of radiation interactions. Cell biology, DNA damage and repair, survival curves and models, radiosensitivity, oxygen effect. Linear energy transfer, relative biological effectiveness. Whole body radiation effects, radioprotectors, radiosensitizers. Hyperthermia. Molecular techniques in radiobiology. Model tumour systems.

Includes: Experiential Learning Activity

Prerequisite(s): PHYS 5203 must have been taken, or be taken concurrently, or permission of the Department.

**PHYS 5208 [0.5 credit] (PHY 5163)****Radiation Protection**

Dose quantities, effects of radiation exposure, fetal risks, scientific basis for protection, dose limits. Background radiation, dose from internal radionuclides. Doses in radiology, incidents in radiation therapy. Shielding design, working with radioactive materials. Instruments and measurement. Radiation protection organizations.

Includes: Experiential Learning Activity

Prerequisite(s): PHYS 5203 or permission of the Department.

**PHYS 5209 [0.5 credit] (PHY 5166)****Medical Physics Practical Measurements**

Experience with current clinical medical imaging and cancer therapy equipment, and dosimetry and biophysics instrumentation. The course requires completion of experimental projects on medical imaging, radiotherapy, dosimetry, and biophysics, conducted at local clinics and NRC laboratories.

Includes: Experiential Learning Activity

Prerequisite(s): PHYS 5203, and two of PHYS 5204, PHYS 5206, PHYS 5207, and enrollment in the medical physics graduate program, or permission of the Department.

**PHYS 5210 [0.0 credit] (PHY 5168)****Anatomy and Physiology for Medical Physicists**

An overview of human anatomy and physiology as background for the application of physics to cancer therapy and medical imaging. Anatomy as depicted by imaging technologies such as CT, MRI, and radiography will be emphasized. Graded Sat/Uns.

Prerequisite(s): enrollment in the graduate program in medical physics or permission of the Department.

**PHYS 5291 [0.5 credit] (PHY 5167)****Advanced Topics in Medical Physics**

Topics may include medical imaging physics, cancer therapy physics, medical biophysics, or radiation protection and health physics.

Prerequisite(s): PHYS 5203 plus, as appropriate to the particular advanced topic offered, at least one of PHYS 5204, PHYS 5206, PHYS 5207; or permission of the Department.

**PHYS 5302 [0.5 credit] (PHY 8132)****Classical Electrodynamics**

Covariant formulation of electrodynamics; Liénard-Wiechert potentials; radiation reaction; plasma physics; dispersion relations.

Prerequisite(s): PHYS 3308, PHYS 3802, and PHYS 3807, or equivalent courses, or permission of the Department.

**PHYS 5313 [0.5 credit]****Physical Applications of Fourier Analysis**

Fourier transform, convolution. Sampling theorem. Applications to imaging: descriptors of spatial resolution, filtering. Correlation, noise power. Discrete Fourier transform, FFT. Filtering of noisy signals. Image reconstruction in computed tomography and magnetic resonance. Laplace transform. Integral transforms, application to boundary value problems. Also offered at the undergraduate level, with different requirements, as PHYS 4203, for which additional credit is precluded.

**PHYS 5318 [0.5 credit] (PHY 5318)****Modern Optics**

Electromagnetic wave propagation; reflection, refraction; Gaussian beams; guided waves. Laser theory: stimulated emission, cavity optics, gain and bandwidth, atomic and molecular lasers. Mode locking, Q switching. Diffraction theory, coherence, Fourier optics, holography, laser applications. Optical communication systems, nonlinear effects: devices, fibre sensors, integrated optics. Prerequisite(s): permission of the Department. Also offered at the undergraduate level, with different requirements, as PHYS 4208, for which additional credit is precluded.

**PHYS 5401 [0.5 credit]****Astrophysics**

Stellar evolution, including stellar modeling, main sequence stars, red giants and the end states of stars such as neutron stars and black holes. Galactic structure and dynamics. Neutrino astrophysics. Also offered at the undergraduate level, with different requirements, as PHYS 4201, for which additional credit is precluded.

**PHYS 5402 [0.5 credit]****Cosmology**

Observational evidence for the Big Bang. Cosmological space-time, expansion dynamics and contents of the universe. Physical processes in the expanding universe, inflation, nucleosynthesis, the cosmic microwave background, dark matter, and dark energy. Also offered at the undergraduate level, with different requirements, as PHYS 4202, for which additional credit is precluded.

**PHYS 5601 [0.5 credit] (PHY 5966)****Experimental Techniques of Nuclear and Elementary Particle Physics**

The interaction of radiation and high energy particles with matter; experimental methods of detection and acceleration of particles; use of relativistic kinematics; counting statistics. Includes: Experiential Learning Activity. Prerequisite(s): PHYS 3308 or equivalent, and PHYS 4707; or permission of the Department.

**PHYS 5602 [0.5 credit] (PHY 5967)****Physics of Elementary Particles**

Standard Model. Properties of leptons, quarks, hadrons. Fundamental interactions: photon, gluons, W/Z bosons. Higgs bosons. Conservation laws, invariance principles, quantum numbers. Decay rates and scattering cross-sections. Quantum electrodynamics and chromodynamics. Resonances. Weak interactions, CKM matrix, parity and CP violation. Neutrino masses and oscillations. Future directions. Prerequisite(s): PHYS 4707 or permission of the Department. Also offered at the undergraduate level, with different requirements, as PHYS 4602, for which additional credit is precluded.

**PHYS 5604 [0.5 credit] (PHY 8164)****Intermediate Nuclear Physics**

Properties of the deuteron and the neutron-proton force. Nucleon-nucleon forces, isospin and charge independence. Nuclear models. Scattering theory. Interpretation of n-p and p-p scattering experiments. Interaction of nucleons with electrons. Interaction of nuclei with radiation. Prerequisite(s): PHYS 4608 or permission of the Department.

**PHYS 5701 [0.5 credit] (PHY 5170)****Intermediate Quantum Mechanics with Applications**

Angular momentum and rotation operations; Wigner and Racah coefficients; several and many electron problem in atoms; variational and Hartree-Fock formalism; introduction to second quantized field theory; scattering theory. Prerequisite(s): PHYS 4707 and PHYS 4708 or permission of the Department.

**PHYS 5702 [0.5 credit] (PHY 8172)****Relativistic Quantum Mechanics**

Relativistic wave equations. Expansion of S matrix in Feynman perturbation series. Feynman rules. An introduction to quantum electro-dynamics with some second quantization. Gauge theories. May include introduction to Standard Model. Prerequisite(s): PHYS 5701 and permission of the Department.

**PHYS 5801 [0.5 credit] (PHY 5140)**  
**Methods of Theoretical Physics I**

This course and PHYS 5802 are designed for students who wish to acquire a wide background of mathematical techniques. Topics can include complex variables, evaluation of integrals, approximation techniques, dispersion relations, Padé approximants, boundary value problems, Green's functions, integral equations.

**PHYS 5802 [0.5 credit] (PHY 5141)**  
**Methods of Theoretical Physics II**

This course complements PHYS 5801. Topics include group theory, discussion of SU<sub>2</sub>, SU<sub>3</sub>, and other symmetry groups. Lorentz group.

**PHYS 5804 [0.5 credit]**  
**Introduction to General Relativity**

Special relativity using tensor analysis. Curved spacetime with physics applications which may include the solar system, stars, black holes, and gravitational waves. Introduction to differential geometry and Einstein's field equations.

Also offered at the undergraduate level, with different requirements, as PHYS 4804, for which additional credit is precluded.

**PHYS 5900 [1.0 credit] (PHY 8290)**  
**Selected Topics in Physics (M.Sc.)**

A student may, with the permission of the Department, take more than one selected topic, in which case each full course is counted for credit.

Prerequisite(s): permission of the Department.

**PHYS 5901 [0.5 credit] (PHY 8191)**  
**Selected Topics in Physics (M.Sc.)**

Prerequisite(s): permission of the Department.

**PHYS 5905 [1.0 credit] (PHY 5495)**  
**Physics in Modern Technology Work Term**

Experience for students enrolled in the physics in modern technology stream. To receive course credit, students must receive satisfactory evaluations for their work term employment. Written and oral reports describing the work term project are required.

Includes: Experiential Learning Activity

Prerequisite(s): registration in the physics in modern technology stream of the M.Sc. program and permission of the Department.

**PHYS 5909 [2.5 credits] (PHY 7999)**  
**M.Sc. Thesis**

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**PHYS 6601 [0.5 credit] (PHY 8165)**  
**Particle Physics Phenomenology**

This course covers much of the required knowledge for research in particle physics from both the experimental and theoretical points of view. Topics may include: standard model, parton model, quark model, hadron spectroscopy, and tests of QCD.

Includes: Experiential Learning Activity

Prerequisite(s): PHYS 5602 and PHYS 5702 or permission of the Department.

**PHYS 6602 [0.5 credit] (PHY 8166)**  
**Advanced Topics in Particle Physics**

Phenomenology. This course will consist of a variety of seminars and short lecture courses, and will cover topics of immediate interest to the research program of the department.

Includes: Experiential Learning Activity

Prerequisite(s): PHYS 6601 or permission of the Department.

**PHYS 6701 [0.5 credit] (PHY 8173)**  
**Quantum Field Theory**

Relativistic quantum field theory; second quantization of Bose and Fermi fields; reduction and LSZ formalism; perturbation expansion and proof of renormalizability of quantum field theories; calculations of radiative corrections and applications.

Prerequisite(s): PHYS 5701 and PHYS 5702, or permission of the Department.

**PHYS 6900 [0.5 credit] (PHY 8490)**  
**Selected Topics in Physics (Ph.D.)**

Prerequisite(s): permission of the Department.

**PHYS 6901 [0.5 credit] (PHY 8391)**  
**Selected Topics in Physics (Ph.D.)**

Prerequisite(s): permission of the Department.

**PHYS 6909 [0.0 credit] (PHY 9999)**  
**Ph.D. Thesis**

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

# Political Economy

This section presents the requirements for programs in:

- **M.A. Political Economy**
- **M.A. Political Economy with Concentration in Work and Labour**
- **M.A. Political Economy with Collaborative Specialization in Accessibility**
- **M.A. Political Economy with Collaborative Specialization in African Studies**
- **M.A. Political Economy with Collaborative Specialization in Climate Change**
- **M.A. Political Economy with Collaborative Specialization in Latin American and Caribbean Studies**
- **Ph.D. Anthropology with Collaborative Specialization in Political Economy**
- **Ph.D. Canadian Studies with Collaborative Specialization in Political Economy**
- **Ph.D. Geography with Collaborative Specialization in Political Economy**
- **Ph.D. History with Collaborative Specialization in Political Economy**
- **Ph.D. Communication with Collaborative Specialization in Political Economy**
- **Ph.D. Legal Studies with Collaborative Specialization in Political Economy**
- **Ph.D. Political Science with Collaborative Specialization in Political Economy**
- **Ph.D. Public Policy with Collaborative Specialization in Political Economy**
- **Ph.D. Social Work with Collaborative Specialization in Political Economy**
- **Ph.D. Sociology with Collaborative Specialization in Political Economy**

## Program Requirements

### M.A. Political Economy (5.0 credits)

#### Requirements - Thesis option (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
PECO 5000 [0.5]	Theories of Political Economy
PECO 5001 [0.5]	Methodologies of Political Economy
<b>2. 2.0 credits in thesis (and an oral examination of the thesis)</b>	2.0
<b>3. 2.0 credits in approved graduate level electives (see Selection of Courses, below) <sup>1</sup></b>	2.0
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay option (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
PECO 5000 [0.5]	Theories of Political Economy
PECO 5001 [0.5]	Methodologies of Political Economy
<b>2. 1.0 credit in research essay</b>	1.0
<b>3. 3.0 credits in approved graduate level electives (see Selection of Courses, below) <sup>1</sup></b>	3.0
<b>Total Credits</b>	<b>5.0</b>

<sup>1</sup> Up to one (1.0) credit may be taken at the 4000 (honours undergraduate) level.

### M.A. Political Economy with Concentration in Work and Labour (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
PECO 5000 [0.5]	Theories of Political Economy
PECO 5001 [0.5]	Methodologies of Political Economy
<b>2. 0.5 credit in:</b>	0.5
PECO 5002 [0.5]	Political Economy of Work and Labour
<b>3. 0.5 credit from:</b>	0.5
PECO 5503 [0.5]	Special Topics in Work and Labour I
PECO 5504 [0.5]	Special Topics in Work and Labour II
<b>4. 0.5 credit from:</b>	0.5
PECO 5904 [0.5]	Placement in Political Economy
PECO 5905 [0.5]	Reflective Practice in Work and Labour
<b>5. 0.5 credit in approved elective</b>	0.5
<b>6. 2.0 credits in:</b>	2.0
PECO 5909 [2.0]	M.A. Thesis (on a Work and Labour topic)
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
PECO 5000 [0.5]	Theories of Political Economy
PECO 5001 [0.5]	Methodologies of Political Economy
<b>2. 0.5 credit in:</b>	0.5
PECO 5002 [0.5]	Political Economy of Work and Labour
<b>3. 0.5 credit from:</b>	0.5
PECO 5503 [0.5]	Special Topics in Work and Labour I
PECO 5504 [0.5]	Special Topics in Work and Labour II
<b>4. 0.5 credit from:</b>	0.5
PECO 5904 [0.5]	Placement in Political Economy
PECO 5905 [0.5]	Reflective Practice in Work and Labour
<b>5. 1.5 credits in approved electives</b>	1.5
<b>6. 1.0 credit in:</b>	1.0
PECO 5908 [1.0]	Research Essay
<b>Total Credits</b>	<b>5.0</b>

### M.A. Political Economy with Collaborative Specialization in Accessibility (5.0 credits)

#### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>	1.0
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 1.0 credit in:</b>	1.0

PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>3. 2.0 credits in:</b>		<b>2.0</b>
PECO 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>4. 1.0 credit in</b>	approved graduate-level electives (see Selection of Courses, below). Up to 1.0 credit may be taken at the 4000-level.	<b>1.0</b>

**Total Credits** **5.0**

#### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
ACCS 5001 [0.5]	Critical Disability Studies	
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5908 [1.0]	Research Essay (in the specialization)	
<b>4. 2.0 credits in</b>	approved graduate-level electives (see Selection of Courses, below). Up to 1.0 credit may be taken at the 4000-level.	<b>2.0</b>

**Total Credits** **5.0**

### M.A. Political Economy with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
PECO 5909 [2.0]	M.A. Thesis (in the specialization, including an oral examination in the thesis)	
<b>5. 1.5 credits in</b>	approved graduate level electives (see Selection of Courses, below) <sup>1</sup>	<b>1.5</b>

**Total Credits** **5.0**

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
PECO 5908 [1.0]	Research Essay (in the specialization)	

**5. 2.5 credits in** approved graduate level electives (see Selection of Courses, below)<sup>1</sup> **2.5**

**Total Credits** **5.0**

<sup>1</sup> Up to one (1.0) credit may be taken at the 4000 (honours undergraduate) level.

### M.A. Political Economy with Collaborative Specialization in Climate Change (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
PECO 5909 [2.0]	M.A. Thesis (in the specialization, including an oral examination)	
<b>5. 1.0 credit in</b>	approved graduate level electives (see Selection of Courses, below) <sup>1</sup>	<b>1.0</b>

**Total Credits** **5.0**

#### Requirements - Research essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
CLIM 5800 [0.0]	Climate Seminar Series	<b>0.0</b>
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 1.0 credit in:</b>		<b>1.0</b>
PECO 5908 [1.0]	Research Essay (in the specialization)	
<b>5. 2.0 credits in</b>	approved graduate level electives (see Selection of Courses, below) <sup>1</sup>	<b>2.0</b>

**Total Credits** **5.0**

<sup>1</sup> Up to one (1.0) credit may be taken at the 4000 (honours undergraduate) level.

### M.A. Political Economy with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>		<b>0.5</b>
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 2.0 credits in:</b>		<b>2.0</b>

PECO 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>5. 1.5 credits in</b>	approved graduate level electives (see Selection of Courses, below) <sup>1</sup>	1.5
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (5.0 credits)</b>		
<b>1. 0.5 credit in:</b>		0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies	
<b>2. 0.0 credit in:</b>		
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies	
<b>3. 1.0 credit in:</b>		1.0
PECO 5000 [0.5]	Theories of Political Economy	
PECO 5001 [0.5]	Methodologies of Political Economy	
<b>4. 1.0 credits in:</b>		1.0
PECO 5908 [1.0]	Research Essay (in the specialization)	
<b>5. 2.5 credits in</b>	approved graduate level electives (see Selection of Courses, below) <sup>1</sup>	2.5
<b>Total Credits</b>		<b>5.0</b>

<sup>1</sup> Up to one (1.0) credit may be taken at the 4000 (honours undergraduate) level.

### Ph.D. Anthropology with Collaborative Specialization in Political Economy (3.0 credits)

<b>Requirements:</b>		
<b>1. 0.5 credit in:</b>		0.5
PECO 6000 [0.5]	Political Economy: Core Concepts	
<b>2. 0.5 credit in</b>	relevant political economy course from the approved list	0.5
<b>3. 1.0 credit in:</b>		1.0
ANTH 6000 [1.0]	Doctoral Seminar: Theory and Method in Contemporary Anthropology	
<b>4. 0.5 credit in:</b>		0.5
ANTH 6002 [0.5]	Research Design	
ANTH 6100 [0.0]	Thesis Writing Seminar	
<b>5. 0.0 credit in</b>	(two terms satisfactory participation in):	0.0
ANTH 6100 [0.0]	Thesis Writing Seminar	
<b>3. 0.5 credits in</b>	SOCI or ANTH courses at the 5000 or 6000 level.	0.5
4. A satisfactory research preparation portfolio		
5. A satisfactory thesis proposal and (when required) Research Ethics Board clearance to undertake thesis research		
6. Satisfactory thesis research		
<b>7. 0.0 credit in:</b>		0.0
ANTH 6909 [0.0]	Ph.D. Thesis (in the specialization, including successful oral defence)	
<b>Total Credits</b>		<b>3.0</b>

### Ph.D. Canadian Studies with Collaborative Specialization in Political Economy (3.0 credits)

<b>Requirements:</b>		
<b>1. 0.5 credit in:</b>		0.5
PECO 6000 [0.5]	Political Economy: Core Concepts	
<b>2. 0.5 credit in</b>	a relevant political economy course from the approved list or the comprehensive in the major field of Policy, Economy and Society.	0.5
<b>3. 1.0 credit in:</b>		1.0
CDNS 6900 [1.0]	Ph.D. Core Seminar: Interdisciplinarity in Canadian Studies: Concepts, Theories and Methods	
<b>4. 1.0 credit in</b>	the successful completion of two 0.5-credit written comprehensive examinations. Students will be examined in two areas of research. (See note)	1.0
5. Language requirement: satisfactory demonstration of an understanding of a language other than English.		
6. A public defence, in English, of a written thesis proposal. Following the completion of their comprehensives, students will be expected to defend a proposal of the research and analysis they plan to undertake in completing their Ph.D. thesis. The thesis proposal defence should normally occur within six months after completion of a student's comprehensive examinations and within the first 27 months of registration in the program. The thesis committee will be composed of three faculty members.		
<b>7. 0.0 credits in</b>	a Thesis (in the specialization which must be successfully defended in English at an oral examination):	0.0
CDNS 6909 [0.0]	Ph.D. Thesis (in the specialization)	
<b>Total Credits</b>		<b>3.0</b>

**Note - Comprehensive Examinations:** full-time students are expected to complete their comprehensive examinations within 24 months of their initial registration in the Ph.D. program. Part-time Ph.D. students should finish their comprehensive examinations within 36 months of completing course work. Both full-time and part-time students should complete their comprehensive examinations before defending their dissertation proposal. Candidates are required to take an oral examination after each written examination.

#### Language Requirement

This requirement is normally fulfilled in at least one of the following ways: providing evidence of proficiency in a language other than English; completing 1.0 credit in non-English language courses at Carleton University or another post-secondary institution; and/or receiving individual instruction or participating in an online and/or community-led language learning program and providing certification of completion and/or obtaining attestation of basic proficiency from the instructor.

### Ph.D. Geography with Collaborative Specialization in Political Economy (2.0 credits)

<b>Requirements:</b>		
<b>1. 1.0 credit in:</b>		1.0

GEOG 6000 [0.5]	Doctoral Core Seminar: Geography, Society and the Environment	
GEOG 6001 [0.5]	Doctoral Core Seminar: Research and Professional Practice	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
PECO 6000 [0.5]	Political Economy: Core Concepts	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
GEOG 6003 [0.5]	Field Seminar: Geography of Societal Change	
GEOG 6004 [0.5]	Field Seminar: Geography of Societal Change	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
GEOG 6906 [0.0]	Comprehensive Examination: The - Geography of Societal Change	
5. Presentation and oral defence of the thesis proposal as outlined below		
<b>6. 0.0 credits in:</b>		<b>0.0</b>
GEOG 6909 [0.0]	Ph.D. Thesis (in the specialization, must be defended at an oral examination)	
7. In addition to the formal requirements, Ph.D. students are required to attend the Departmental Seminar series and the Graduate Field Camp.		
<b>Total Credits</b>		<b>2.0</b>

### Ph.D. History with Collaborative Specialization in Political Economy (5.0 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
PECO 6000 [0.5]	Political Economy: Core Concepts	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
HIST 6701 [0.5]	History and Political Economy	
Or 0.5 credit in a relevant political economy course from the approved list.		
<b>3. 1.0 credit in:</b>		<b>1.0</b>
HIST 6808 [1.0]	Doctoral Seminar in Historical Theory and Method	
<b>4. 1.5 credits in:</b>		<b>1.5</b>
HIST 6906 [0.5]	Ph.D. Tutorials (in the candidate's field; taken three times)	
<b>5. 0.5 credits in:</b>		<b>0.5</b>
HIST 6907 [0.5]	Ph.D. Comprehensive Examination	
<b>6. 1.0 credit in</b>	Professional Development courses:	<b>1.0</b>
HIST 6805 [0.5]	Professional Development Project I	
HIST 6806 [0.5]	Professional Development Project II	
Or another approved course.		
<b>7. 0.0 credits in:</b>		
HIST 6909 [0.0]	Ph.D. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### Ph.D. Communication with Collaborative Specialization in Political Economy (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
COMS 6000 [1.0]	Doctoral Seminar in Communication Studies	

**2. 1.0 additional credit from the list of optional courses below: up to 0.5 credit may be taken in a relevant discipline outside of the School; students in the Ph.D. program are restricted to 0.5 credit in directed studies: COMS 6010 Directed Studies** **1.0**

**3. 2.0 credits in:** **2.0**

COMS 6101 [0.5]	Comprehensive Exam: Field I	
COMS 6102 [0.5]	Comprehensive Exam: Field II	
COMS 6908 [1.0]	Ph.D. Thesis Proposal	

**4. 0.5 credit in:** **0.5**

PECO 6000 [0.5]	Political Economy: Core Concepts	
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**5. 0.5 credit in:** **0.5**

A relevant political economy course from the approved list.

**6. 0.0 credits in:** **0.0**

COMS 6909 [0.0]	Ph.D. Thesis (In the Specialization. Must be successfully defended at an oral examination.)	
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**Total Credits** **5.0**

### Ph.D. Legal Studies with Collaborative Specialization in Political Economy (4.5 credits)

#### Requirements:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
LAWS 6000 [0.5]	Doctoral Seminar in Legal Studies	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
LAWS 6001 [0.5]	Proseminar in Legal Studies	
<b>4. 2.0 credits in:</b>		<b>2.0</b>
LAWS 6095 [1.0]	Field Comprehensive	
LAWS 6096 [1.0]	Thesis Proposal	
<b>5. 0.5 credit from:</b>		<b>0.5</b>
LAWS 6002 [0.5]	Law, Regulation and Governance	
LAWS 6003 [0.5]	Human Rights, Citizenship and Global Justice	
LAWS 6004 [0.5]	Crime, Law, and Security	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
PECO 6000 [0.5]	Political Economy: Core Concepts	
<b>7. 0.5 credit in:</b>		<b>0.5</b>
A relevant political economy course from the approved list		
<b>8. 0.0 credits in:</b>		<b>0.0</b>
LAWS 6909 [0.0]	Ph. D. Thesis (In the specialization. Must be successfully defended at an oral examination.)	
<b>Total Credits</b>		<b>4.5</b>

### Ph.D. Political Science with Collaborative Specialization in Political Economy (5.0 credits)

#### Requirements:

<b>1. 2.0 credits in</b>	courses at the 6000 level in each of the candidate's two major fields of study	<b>2.0</b>
<b>2. 1.0 credit in:</b>		<b>1.0</b>
PSCI 6900 [0.5]	Ph.D. Field Examination I	
PSCI 6905 [0.5]	Ph.D. Field Examination II	

Field examinations normally take place once per year, in August. At the discretion of the Department, candidates may be required to take an oral examination following the written examination. Full-time students are normally required to complete the comprehensive examinations within 24 months of entering the program.

3. Proficiency in a research skill, as outlined below under Research Skill Requirement	
<b>4. 0.5 credit in:</b>	0.5
PECO 6000 [0.5]	Political Economy: Core Concepts
<b>5. 0.5 credit in:</b>	0.5
A relevant political economy course from the approved list	
<b>6. 1.0 credit in:</b>	1.0
PSCI 6907 [0.5]	Thesis Proposal Workshop I
PSCI 6908 [0.5]	Thesis Proposal Workshop II
7. An oral defence of a written dissertation proposal. Full-time students must normally complete the oral defence of the proposal, preceded by its formal acceptance by the supervisory committee, in the third year of their doctoral program.	
<b>8. 0.0 credits in:</b>	0.0
PSCI 6909 [0.0]	Ph.D. Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

### Ph.D. Public Policy with Collaborative Specialization in Political Economy (4.5 credits)

#### Requirements:

<b>1. 2.0 credits in:</b>	2.0
PADM 6010 [0.5]	Current Issues in Public Policy
PADM 6011 [0.5]	Theoretical Foundations of Public Policy
PADM 6012 [0.5]	Policy Process and Institutions
PADM 6013 [0.5]	Research Design for Public Policy
<b>2. 0.5 credit in</b> research methods, such as PADM 5218 or another research methods course at the 5000 or 6000 level (See Note 1, below)	0.5
<b>3. 0.5 credit in:</b>	0.5
PECO 6000 [0.5]	Political Economy: Core Concepts
<b>4. 0.5 credit in:</b>	0.5
A relevant political economy course from the approved list.	
<b>5. 0.5 credit in:</b>	0.5
PADM 6900 [0.5]	Ph.D. Comprehensive Examination (See Note 2, below)
<b>6. 0.5 credit in:</b>	0.5
PADM 6201 [0.5]	Doctoral Research Seminar (See Note 3, below)
<b>7. Public defence of a written thesis proposal</b>	
<b>8. 0.0 credits in:</b>	0.0
PADM 6909 [0.0]	Ph.D. Thesis (in the specialization)
<b>9. Language requirement (See Note 5, below)</b>	
<b>Total Credits</b>	<b>4.5</b>

#### Notes

- Course components:** The four required courses PADM 6010 Current Issues in Public Policy, PADM 6011 Theoretical Foundations of Public Policy, PADM 6012 Policy Process and Institutions, and

PADM 6013 Research Design for Public Policy will normally be taken in the first year of full-time study. The research methods course and specialization courses must be chosen by the student after consultation with, and approval by, the student's thesis supervisor and the Ph.D. Program Supervisor. Graduate courses offered by the School or by other university departments may be approved. When necessary, students must arrange formal permission from the relevant department for admission to courses.

- Comprehensive Examination:** Students will write a Comprehensive Examination, normally in the summer term of the first year, after they have successfully completed each of the four required courses PADM 6010 Current Issues in Public Policy, PADM 6011 Theoretical Foundations of Public Policy, PADM 6012 Policy Process and Institutions, and PADM 6013 Research Design for Public Policy with a grade of B- or higher, and with an overall GPA of 9.0 (B+) or higher. The examination will focus on the material presented in the required courses. At the discretion of the examining board, a candidate whose performance is not satisfactory may be asked to take a second written examination.
- Doctoral Research Seminar:** Full-time students will normally register in PADM 6201 Doctoral Research Seminar over two terms in their second year of study. As part of the seminar, a research project will be prepared under the direction of the thesis supervisor and be preliminary to and supportive of the Ph.D. Thesis. Possible formats – to be approved by the supervisor – include a comprehensive and critical literature survey, or a self-contained study applying the principles of research design and research methods to an area of inquiry related to the specialization courses.
- Thesis:** Following the successful completion of the Comprehensive Examination, students will prepare a formal thesis proposal under a thesis advisory committee. The thesis supervisor will normally be a faculty member from the School of Public Policy and Administration. The proposal will normally be submitted by the end of the summer term of the second year of full-time registration and defended early in the fall term of the third year. The thesis must demonstrate an advanced ability to integrate multiple disciplines into the analysis of public policy. The thesis must be defended at an oral examination.
- Language Requirement:** Students will be required to demonstrate a reading knowledge of French. Another language may be substituted for French, if it is relevant to the thesis.

### Ph.D. Social Work with Collaborative Specialization in Political Economy (5.5 credits)

**Note:** Admission to the Ph.D. Social Work with Collaborative Specialization in Political Economy is currently closed. Please contact the department if you have any questions.

**Requirements:**

<b>1. 1.0 credit in:</b>	1.0
SOWK 6101 [0.5]	Theoretical Foundations
SOWK 6102 [0.5]	Ethical Foundations
<b>2. 0.5 credit in:</b>	0.5
PECO 6000 [0.5]	Political Economy: Core Concepts
<b>3. 0.5 credit in a relevant political economy course from the approved list</b>	0.5
<b>4. 1.0 credit in:</b>	1.0
SOWK 6201 [0.5]	Theory and Methods
SOWK 6202 [0.5]	Research Design
<b>5. 0.5 credit in:</b>	0.5
SOWK 6401 [0.5]	Critical Pedagogy
<b>6. 1.0 credit in:</b>	1.0
SOWK 6301 [0.25]	Ph.D. Seminar
SOWK 6302 [0.25]	Ph.D. Seminar
SOWK 6303 [0.25]	Ph.D. Seminar
SOWK 6304 [0.25]	Ph.D. Seminar
<b>7. 0.5 credit in:</b>	0.5
SOWK 6600 [0.5]	Practicum in Advocacy Research
or	
0.5 credit in an approved research course at an equivalent level in another discipline	
<b>8. 0.5 credit in:</b>	0.5
SOWK 6800 [0.5]	Qualifying Examination
<b>9. 0.0 credits in:</b>	0.0
SOWK 6909 [0.0]	PhD Dissertation (in the specialization)

**Total Credits** **5.5**

### Ph.D. Sociology with Collaborative Specialization in Political Economy (3.0 credits)

**Requirements:**

<b>1. 0.5 credit in:</b>	0.5
PECO 6000 [0.5]	Political Economy: Core Concepts
<b>2. 0.5 credit in:</b>	0.5
A relevant political economy course from the approved list or part of comprehensive preparation in the subfield of political economy	
<b>3. 0.0 credit in:</b>	0.0
SOCI 6101 [0.0]	Introductory Doctoral Seminar
<b>4. 1.0 credit in:</b>	1.0
SOCI 6102 [0.5]	Doctoral Seminar Year 1: Comprehensive Exam
SOCI 6103 [0.5]	Doctoral Seminar Year 2: Research Design
<b>5. 0.5 credit in:</b>	0.5
SOCI 5008 [0.5]	Teaching Sociology

Or one of the following

SOCI 5000 [0.5]	Classical Sociological Theory
SOCI 5001 [0.5]	Special Topics in Classical Theory
SOCI 5002 [0.5]	Contemporary Sociological Theory
SOCI 5003 [0.5]	Special Topics in Contemporary Theory
SOCI 5006 [0.5]	Thinking Sociologically
SOCI 5308 [0.5]	Decolonizing Feminist Analyses
SOCI 5309 [0.5]	Cultural Theory

SOCI 5400 [0.5]	Political Sociology
SOCI 5401 [0.5]	Critical Disability Studies
SOCI 5402 [0.5]	Queer Migrations
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies
SOCI 5405 [0.5]	Power and Stratification
SOCI 5407 [0.5]	Genealogies of Politics and Governance
SOCI 5408 [0.5]	Feminism and Materialism
SOCI 5501 [0.5]	Phenomenology for Anthropologists and Sociologists
SOCI 5803 [0.5]	Critical Theory
SOCI 5804 [0.5]	Modern Marxist Theory
<b>6. 0.5 credit in</b>	0.5
SOCI courses at the 5000- or 6000-level or, with the permission of the graduate supervisor, up to 1.0 credit of graduate level courses from another unit at Carleton	
7. Written and oral comprehensive examination in one area of specialization	
8. Presentation of a thesis proposal	
<b>9. 0.0 credits in:</b>	0.0
SOCI 6909 [0.0]	Ph.D. Thesis (in the specialization)
10. An oral defence of the thesis	
<b>Total Credits</b>	<b>3.0</b>

**Selection of Courses - Political Economy**

In addition to the graduate courses offered by, or associated with, the Institute of Political Economy, the courses listed below are relevant to students of political economy and would, with the prior approval of the Institute, be used to design a coherent and internally complementary set of courses to fulfill degree requirements. The list is not exclusive and is subject to change. All courses marked with an \* are special topics and need permission of the Director.

Master's students may select 1.0 credit in political economy at the 4000-level.

**Anthropology**

ANTH 5109 [0.5]	Ethnography of Gender
ANTH 5208 [0.5]	Anthropology of Indigeneity
ANTH 5560 [0.5]	Economic Anthropology
ANTH 5704 [0.5]	Anthropology of the Body, Health, Illness and Healing
ANTH 5808 [0.5]	Special Topics in North American Ethnography (*)
ANTH 5809 [0.5]	Special Topics in the Anthropology of Development (*)

**Canadian Studies**

CDNS 5101 [0.5]	Indigenous Peoples, Canada and the North
CDNS 5102 [0.5]	Indigenous Politics and Resurgence in Canada
CDNS 5201 [0.5]	Critical Perspectives on Canadian Feminism
CDNS 5202 [0.5]	Gendering Canada: Selected Contemporary Debates
CDNS 5501 [0.5]	Decolonizing Canada: Cultural Politics and Collective Identities

CDNS 5601 [0.5]	Constructing Canada: The Politics of National Identity
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### Communication and Media Studies

COMS 5200 [0.5]	Civic Media
COMS 5206 [0.5]	Communication, Culture, Regulation
COMS 5214 [0.5]	The Local and the Global
COMS 5219 [0.5]	Regional Studies of Media
COMS 5224 [0.5]	Internet, Infrastructure, Materialities
COMS 5225 [0.5]	Critical Data Studies

### Geography

GEOG 5005 [0.5]	Global Environmental Change: Human Implications
GEOG 5400 [0.5]	Territory and Territoriality
GEOG 5500 [0.5]	Special Topics in the Study of Cities and Urbanization (*)
GEOG 5502 [0.5]	Special Topics in Geography of Globalization (*)
GEOG 5600 [0.5]	Empire and Colonialism

### History

HIST 5210 [0.5]	Power
HIST 5211 [0.5]	Consumption
HIST 5314 [0.5]	Colonialism and Postcolonialism in Canada
HIST 5315 [0.5]	State and Society in Canadian History
HIST 5803 [0.5]	History of Women, Gender and Sexuality: Foundations

### Law

LAWS 5002 [0.5]	Law and Gender Relations
LAWS 5003 [0.5]	Law, Economy and Society
LAWS 5004 [0.5]	Law, Crime and Social Order
LAWS 5005 [0.5]	Law, State and Politics
LAWS 5006 [0.5]	Historical Perspectives on Law and Society
LAWS 5007 [0.5]	Race, Ethnicity and the Law
LAWS 5200 [0.5]	International Economic Law: Regulation of Trade and Investment
LAWS 5302 [0.5]	Feminism, Law and Social Transformation
LAWS 5306 [0.5]	Police and Capital

### Political Economy

PECO 5501 [0.5]	Special Topics in Political Economy I	
PECO 5502 [0.5]	Special Topics in Political Economy II	
PECO 5503 [0.5]	Special Topics in Work and Labour I	0.5
PECO 5504 [0.5]	Special Topics in Work and Labour II	0.5
PECO 5904 [0.5]	Placement in Political Economy	0.5
PECO 5905 [0.5]	Reflective Practice in Work and Labour	0.5

### Political Science

PSCI 5003 [0.5]	Political Parties in Canada
PSCI 5009 [0.5]	Canadian Political Economy
PSCI 5100 [0.5]	Indigenous Activism on Turtle Island: Take That, Colonialism!
PSCI 5107 [0.5]	Globalization, Adjustment and Democracy in Africa
PSCI 5202 [0.5]	Development Theory and Issues
PSCI 5207 [0.5]	International Political Sociology
PSCI 5208 [0.5]	Global Social Policy
PSCI 5209 [0.5]	Forced Migration and Global Politics
PSCI 5303 [0.5]	Genealogies of Politics and Governance
PSCI 5410 [0.5]	Postcolonial Theories and Practices
PSCI 5607 [0.5]	Politics of North America
PSCI 5802 [0.5]	Global Money Rules
PSCI 5808 [0.5]	International Political Economy
PSCI 5810 [0.5]	Approaches to Environmental Politics

### Public Administration

PADM 5213 [0.5]	Gender and Public Policy
PADM 5220 [0.5]	Regulation and Public Policy
PADM 5224 [0.5]	Indigenous Policy
PADM 5228 [0.5]	Social Policy
PADM 5814 [0.5]	Program and Project Management

### Sociology

SOCI 5000 [0.5]	Classical Sociological Theory
SOCI 5002 [0.5]	Contemporary Sociological Theory
SOCI 5205 [1.0]	Canadian Society
SOCI 5209 [0.5]	Sociology of Science and Technology
SOCI 5305 [0.5]	Police and Capital
SOCI 5308 [0.5]	Decolonizing Feminist Analyses
SOCI 5400 [0.5]	Political Sociology
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies
SOCI 5405 [0.5]	Power and Stratification
SOCI 5407 [0.5]	Genealogies of Politics and Governance
SOCI 5408 [0.5]	Feminism and Materialism
SOCI 5409 [0.5]	The Politics of Social Movements and the State
SOCI 5504 [0.5]	Special Topics in Political Economy I
SOCI 5607 [0.5]	Contemporary Theories of Crime and Social Regulation
SOCI 5804 [0.5]	Modern Marxist Theory
SOCI 5806 [0.5]	Special Topics in Sociology (*)

### Social Work

SOWK 5013 [0.5]	Community-Based Participatory Research	0.5
SOWK 5014 [0.5]	Social Policy	0.5
SOWK 5015 [0.5]	Indigenous Knowledge and Theory for Social Work	0.5

SOWK 5017 [0.5]	Advanced Organizational Administration and Practice	0.5
SOWK 5502 [0.5]	The Transformation of Social Responsibility in Canada	0.5
SOWK 5700 [0.5]	Special Topics in Social Policy (*)	0.5

## Regulations

See the General Regulations section of this Calendar.

All master's candidates must maintain B standing or better (GPA of 8.0). A candidate may, with the recommendation of the Institute and the approval of the Dean of the Faculty of Graduate Studies and Research, be allowed a grade of C+ in 0.5 credit.

## Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the:

- M.A. Political Economy including all concentrations and specializations, and
- Graduate Diploma in Work and Labour

is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## Academic Regulations

See the General Regulations section of this Calendar.

## Admission

The normal requirement for admission to the master's program is B.A. Honours, with at least high honours standing, in one of the disciplines represented in the Institute. Prospective applicants without such qualifications may be considered for admission if they have both a strong academic record and relevant work experience.

## Admission

Students who are enrolled in a doctoral program in one of the participating units may apply to the Institute of Political Economy for admission to the Collaborative Specialization. Admission to the specialization is determined by the Institute and will normally take place before the end of the first term of registration in one of the participating doctoral programs.

Admission requirements to the Collaborative Ph.D. with a Specialization in Political Economy are:

- Registration in the Ph.D. program of one of the participating units;
- Selection of a thesis topic with political economy content. The Specialization Committee will determine, in consultation with the supervisor, if the political economy content of the thesis meets the requirements of the Collaborative Specialization.

## Political Economy (PECO) Courses

### PECO 5000 [0.5 credit]

#### Theories of Political Economy

Students analyze and synthesize the core concepts and ideas proposed by both the founders and modern practitioners of political economy. The course focuses on theories of power relations and inequalities and assesses the consequences of these theories.

### PECO 5001 [0.5 credit]

#### Methodologies of Political Economy

Students conceptualize, design, and conduct an interdisciplinary research project in political economy, using an appropriate methodological approach. Methodological alternatives are compared.

### PECO 5002 [0.5 credit]

#### Political Economy of Work and Labour

Students analyze and synthesize key concepts and debates in the political economy of work and labour, with particular attention to divisions of labour, power structures, and histories of struggle.

### PECO 5501 [0.5 credit]

#### Special Topics in Political Economy I

Topic varies from year to year. Students should check with the Institute regarding the topic offered. Also listed as SOCI 5504, PSCI 5501.

### PECO 5502 [0.5 credit]

#### Special Topics in Political Economy II

Topic varies from year to year. Students should check with the Institute regarding the topic offered. Also listed as SOCI 5505, PSCI 5502.

### PECO 5503 [0.5 credit]

#### Special Topics in Work and Labour I

Topics and emphasis vary from term to term according to current policies and events influencing the distribution and benefits of work and labour including migration, technological and environmental change, privatization, austerity, and transnational legislation. Also listed as PSCI 5504, SOCI 5503.

### PECO 5504 [0.5 credit]

#### Special Topics in Work and Labour II

Topics and emphasis vary from term to term according to current policies and events influencing the distribution and benefits of work and labour including migration, technological and environmental change, privatization, austerity, and transnational legislation. Also listed as PSCI 5505, SOCI 5502.

**PECO 5505 [0.5 credit]****Special Topics in Political Economy III**

Topic varies from year to year. Students should check with the Institute regarding the topic offered.

**PECO 5506 [0.5 credit]****Special Topics in Political Economy IV**

Topic varies from year to year. Students should check with the Institute regarding the topic offered.

**PECO 5900 [0.5 credit]****Tutorial in Political Economy**

Directed readings on selected aspects of political economy, involving preparation of papers as the basis for discussion with the tutor. Offered when no regular course offering meets a candidate's specific needs.

Prerequisite(s): permission of the Director.

**PECO 5904 [0.5 credit]****Placement in Political Economy**

Course participants earn credit by contributing to organizations engaged in research, policy, and advocacy activities related to IPE. Students will have opportunities to participate in and contribute to the mission of their placement organizations, develop professional skills, and reflect on career goals.

Includes: Experiential Learning Activity

Precludes additional credit for PECO 5907 (no longer offered).

Prerequisite(s): permission of the Institute. Completion of PECO 5002 and completion or concurrent registration in PECO 5503/5504 for Work and Labour students. For all other IPE students, completion of PECO 5000 and at least one elective.

**PECO 5905 [0.5 credit]****Reflective Practice in Work and Labour**

This course is designed for students already engaged as staff or active volunteers in unions or other work- and labour-focused community organizations. Written work and discussion offers a space to reflect on questions of strategy, organization, and analysis relevant to their organization's mission.

Includes: Experiential Learning Activity

Precludes additional credit for PECO 5906 (no longer offered).

Prerequisite(s): PECO 5002 and completion of or concurrent registration in PECO 5503 or 5504 and permission of the Institute.  
unscheduled

**PECO 5908 [1.0 credit]****Research Essay**

Directly linked to the student's course work, the research essay must be interdisciplinary in approach.

Includes: Experiential Learning Activity

**PECO 5909 [2.0 credits]****M.A. Thesis**

The thesis is an alternative to the research essay. It must also be interdisciplinary in approach, and requires greater substance and originality than the Research Essay.

Normally, a student's thesis committee will be composed of members from more than one discipline.

Includes: Experiential Learning Activity

**PECO 6000 [0.5 credit]****Political Economy: Core Concepts**

Students analyze and synthesize the historical evolution of, and contemporary debates in, political economy through interdisciplinary dialogue. Students develop knowledge of political economy theories compatible with their own research interests.

# Political Management

This section presents the requirements for programs in:

- **Master of Political Management**

## Program Requirements

### Master of Political Management (5.0 credits)

#### Requirements:

<b>1. 1.0 credit in core courses:</b>	<b>1.0</b>
POLM 5007 [0.25] Writing in a Political Context	
POLM 5008 [0.25] Ethics in Political Management	
POLM 5009 [0.25] Media Relations	
POLM 5018 [0.25] Strategic Communications	
<b>2. 0.5 credit from:</b>	<b>0.5</b>
POLM 5001 [0.5] Parliament and Parties in Canada	
POLM 5002 [0.5] The Core Executive in Canada	
POLM 5017 [0.5] Political Institutions in a Comparative Context	
<b>3. 1.0 credit in practicum placement arranged through the program, combined with an integrative analytical work:</b>	<b>1.0</b>
POLM 5099 [1.0] Practicum Placement	
<b>4. 2.5 credits in POLM at the 5000 level or other courses as approved by the Graduate Supervisor.</b>	<b>2.5</b>
<b>Total Credits</b>	<b>5.0</b>

## Regulations

See the General Regulations section of this Calendar.

A standing of B- or higher must be obtained in each course or component counted towards the degree.

## Admission

Applicants must:

- hold an honours baccalaureate or equivalent with at least high honours standing; and
- demonstrate a commitment to and aptitude for political management through prior involvement in party or campus politics, grassroots organization, political advocacy, or similar experience.

Although there is no formal second language requirement for the degree, individuals preparing for political professions in Canada should have or develop a facility in French.

Applicants whose first language is not English, or who have not completed a previous degree at an English-language university must demonstrate fluency in English via any one of the criteria outlined in the general regulations of the Graduate calendar.

## Accelerated Pathway

The accelerated pathway to the Master of Political Management (MPM) degree is a flexible and individualized plan of graduate study. Students may qualify if they have demonstrated academic excellence and are in their final year of a relevant Carleton undergraduate degree, such as the BPAPM degree or a BA degree in political science, communication and media studies, or other discipline related to political management.

Students in their third-year of study in the undergraduate program should consult with both their academic supervisor and the political management program supervisor to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate study.

To be eligible to participate in the accelerated pathway, students must have a minimum overall CGPA of A- in undergraduate courses and must complete POLM 3000, PSCI 3410 or COMS 3100.

Students may receive advanced standing with transfer of credit of up to 1.0 credit in POLM courses at the 5000 level, with grade of B+ or higher, which can reduce their time to completion.

Please note that:

1. POLM courses eligible for advanced standing cannot include the core requirements of the program.
2. Participation in the accelerated pathway does not guarantee entry into the MPM program. To be considered for admission to the MPM program, students must submit a formal application for consideration by the program's admissions committee.

## Political Management (POLM) Courses

### POLM 5001 [0.5 credit]

#### Parliament and Parties in Canada

A critical introduction to the exercise of political power in Canada, concentrating on political management in the context of Parliament and political parties.

Includes: Experiential Learning Activity

### POLM 5002 [0.5 credit]

#### The Core Executive in Canada

A critical examination of the main institutions and personnel that shape public policy within the executive branch, with particular emphasis on the Cabinet process and the relationship between political actors and the public service.

Includes: Experiential Learning Activity

### POLM 5004 [0.5 credit]

#### Advanced Strategic Communications

An exploration of how to understand an issue environment, develop positive and productive social media and mainstream media approaches, create a crisis communications strategy, and ensure a strong reputation management capacity.

Includes: Experiential Learning Activity

Prerequisite(s): POLM 5018.

**POLM 5005 [0.5 credit]****Political Offices**

A critical examination of the diverse roles of political staffers working in the offices of elected officials in Canada, with a focus on federal executive and parliamentary offices but also including work in the context of election campaigns, political parties, municipal and provincial governments.

Includes: Experiential Learning Activity

**POLM 5007 [0.25 credit]****Writing in a Political Context**

Introduction to effective political writing. Key concepts will be applied to practical assignments such as news releases, briefing notes, speeches and key messages.

**POLM 5008 [0.25 credit]****Ethics in Political Management**

An examination of the ethical codes that should guide activities and professional relationships of individuals working in the political system.

Includes: Experiential Learning Activity

**POLM 5009 [0.25 credit]****Media Relations**

The theory and practice of media relations in a political environment.

Includes: Experiential Learning Activity

**POLM 5010 [0.5 credit]****Polling and Opinion Research**

Exploring theory, design, and execution of public opinion research to support campaign and advocacy strategies. Overview of ways to incorporate research in strategy development, methodologies used, and how to use opinion research to make better decisions. No statistical or mathematical background required.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as POLM 4010, for which additional credit is precluded.

**POLM 5011 [0.5 credit]****Political Campaigns**

A strategic approach to developing and executing political campaigns (national, regional, local and issue-based), including: campaign ethics; campaign organization; use of new technology and social media; fundraising and budget; development and delivery of messages; GOTV efforts; policy and platform; issue management; tour; innovations and trends.

Includes: Experiential Learning Activity

**POLM 5012 [0.5 credit]****Advocacy and Government Relations in Canada**

Through applied exercises, case studies and a project with an external organization, students will build knowledge and skills required for advocacy and government relations in the private and voluntary sectors. Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as POLM 4012, for which additional credit is precluded.

**POLM 5013 [0.5 credit]****Political Management and the Media**

An examination of the organization and practices of major media. Coverage of public officials, public policy issues and legislative battles, paying particular attention to the current and seismic changes in the media as agencies of public address, and the consequences for politics and governance.

Includes: Experiential Learning Activity

**POLM 5014 [0.5 credit]****Political Marketing**

Using case studies and simulation exercises, the course will provide students with an understanding of political marketing strategy, market intelligence, consultation and participation, political product development and branding, and marketing practices in government.

Includes: Experiential Learning Activity

Also listed as COMS 5205.

**POLM 5015 [0.5 credit]****Public Policy for Political Advisors**

An introduction to policy analysis and process for political advisors. Topics include agenda setting, instrument choice, policy advice, decision-making, intersectional analysis, decolonial perspectives, and implementation. Through case studies and simulations, students will learn to apply concepts and principles to current policy issues in Canadian politics.

Includes: Experiential Learning Activity

**POLM 5016 [0.5 credit]****Applied Policy Analysis**

A critical examination of one or more current policy debates from a political management perspective.

Includes: Experiential Learning Activity

Prerequisite(s): POLM 5015 or permission of the instructor.

**POLM 5017 [0.5 credit]****Political Institutions in a Comparative Context**

A comparative study of the political institutions of several nations or sub-national jurisdictions, including both formal structures and accepted practices.

**POLM 5018 [0.25 credit]****Strategic Communications**

An introduction to the practice of strategic communications in Canadian politics. Students will learn key concepts by preparing a professional communications plan.

Includes: Experiential Learning Activity

**POLM 5019 [0.5 credit]****Comparative Ethics Regimes**

Examination and critique of ethics regulations including conflict of interest, lobbying, and post-employment at the federal, provincial and municipal levels in Canada with comparison to select other jurisdictions such as the United States, United Kingdom and the European Union.

Includes: Experiential Learning Activity

**POLM 5020 [0.5 credit]****Political Office Management**

A focused examination of particular activities conducted by Canadian political staffers in ministerial and parliamentary offices and development of applied skills in areas such as human resource management, office budget management, opposition research, issues management.

Includes: Experiential Learning Activity

**POLM 5021 [0.25 credit]****Political Speechwriting**

The development of effective speechwriting techniques.

Includes: Experiential Learning Activity

Prerequisite(s): POLM 5007.

**POLM 5022 [0.5 credit]****Prime Ministerial Leadership in Canada**

The application of a political management perspective to the exercise of prime ministerial power in Canada. Using several theories and case studies, examining which styles of leadership are most successful in a variety of political contexts.

**POLM 5099 [1.0 credit]****Practicum Placement**

375 hours of supervised work experience in an appropriate placement relevant to political management and approved by the practicum coordinator. Graded SAT/UNS.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the department.

**POLM 5900 [0.5 credit]****Directed Study**

A program of supervised reading and preparation of written work in an area not covered by an existing graduate seminar may be arranged with permission of the Department.

**POLM 5905 [0.5 credit]****Special Topics in Political Management**

Topics vary from year to year. Students should check with the Department regarding the topic offered.

**POLM 5906 [0.25 credit]****Special Topics in Political Management**

Topics vary from year to year. Students should check with the program regarding the topic.

## Political Science

This section presents the requirements for programs in:

- **M.A. Political Science**
- **M.A. Political Science with Collaborative Specialization in African Studies**
- **M.A. Political Science with Specialization in Latin American and Caribbean Studies**
- **Ph.D. Political Science**
- **Ph.D. Political Science with Collaborative Specialization in African Studies**
- **Ph.D. Political Science with Collaborative Specialization in Political Economy**

### Program Requirements

#### M.A. Political Science (5.0 credits)

Details on all program requirements are provided in the departmental Guidelines for M.A. Candidates.

All master's candidates will fulfill a 5.0-credit program. A maximum of 1.0 credit may be taken at the 4000-level. The student may choose to take a maximum of 1.0 credit at the graduate level outside the Department of Political Science.

##### Requirements - Coursework pathway (5.0 credits)

1. 5.0 credits in approved courses	5.0
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Research essay pathway (5.0 credits)

1. 1.0 credit in:	1.0
PSCI 5908 [1.0] M.A. Research Essay	
2. 4.0 credits in approved courses	4.0
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Thesis pathway (5.0 credits)

1. 2.0 credits in:	2.0
PSCI 5909 [2.0] M.A. Thesis	
2. 3.0 credits in approved courses	3.0
<b>Total Credits</b>	<b>5.0</b>

#### M.A. Political Science with Collaborative Specialization in African Studies (5.0 credits)

##### Requirements - Coursework pathway (5.0 credits)

1. 0.5 credit in:	0.5
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	
2. 0.0 credit in:	0.0
AFRI 5800 [0.0] Scholarly Preparation in African Studies	
3. 0.5 credit from:	0.5
PSCI 5107 [0.5] Globalization, Adjustment and Democracy in Africa	
PSCI 5203 [0.5] Southern Africa After Apartheid	
PSCI 5600 [0.5] Africa's International Relations	
4. 0.5 credit in course designated as having sufficient African Studies content, approved by both the Graduate Supervisor in Political Science and the Graduate Coordinator of the Institute of African Studies	0.5

5. 3.5 credits in approved courses	3.5
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Research essay pathway (5.0 credits)

1. 0.5 credit in:	0.5
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	
2. 0.0 credit in:	0.0
AFRI 5800 [0.0] Scholarly Preparation in African Studies	
3. 0.5 credit from:	0.5
PSCI 5107 [0.5] Globalization, Adjustment and Democracy in Africa	
PSCI 5203 [0.5] Southern Africa After Apartheid	
PSCI 5600 [0.5] Africa's International Relations	
4. 0.5 credit in course designated as having sufficient African Studies content, approved by both the Graduate Supervisor in Political Science and the Graduate Coordinator of the Institute of African Studies	0.5
5. 1.0 credit in:	1.0
PSCI 5908 [1.0] M.A. Research Essay (in the specialization)	
6. 2.5 credits in approved courses	2.5
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Thesis pathway (5.0 credits)

1. 0.5 credit in:	0.5
AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives	
2. 0.0 credit in:	0.0
AFRI 5800 [0.0] Scholarly Preparation in African Studies	
3. 0.5 credit from:	0.5
PSCI 5107 [0.5] Globalization, Adjustment and Democracy in Africa	
PSCI 5203 [0.5] Southern Africa After Apartheid	
PSCI 5600 [0.5] Africa's International Relations	
4. 0.5 credit in course designated as having sufficient African Studies content, approved by both the Graduate Supervisor in Political Science and the Graduate Coordinator of the Institute of African Studies	0.5
5. 2.0 credits in:	2.0
PSCI 5909 [2.0] M.A. Thesis (in the specialization)	
6. 1.5 credits in approved courses	1.5
<b>Total Credits</b>	<b>5.0</b>

#### M.A. Political Science with Specialization in Latin American and Caribbean Studies (5.0 credits)

##### Requirements - Thesis pathway (5.0 credits)

1. 0.5 credit in:	0.5
LACS 5000 [0.5] Interdisciplinary Approaches to Latin American and Caribbean Studies	
2. 0.0 credit in:	0.0
LACS 5800 [0.0] Scholarly Preparation in Latin American and Caribbean Studies	
3. 2.0 credits in:	2.0
PSCI 5909 [2.0] M.A. Thesis (in the specialization)	

<b>4. 2.5 credits in</b> electives at the 5000-level, as approved by the graduate supervisor	2.5
<b>Total Credits</b>	<b>5.0</b>
<b>Requirements - Research essay pathway (5.0 credits)</b>	
<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.0 credit in:</b>	1.0
PSCI 5908 [1.0]	M.A. Research Essay (in the specialization)
<b>4. 3.5 credits in</b> electives at the 5000-level, as approved by the graduate supervisor	3.5
<b>Total Credits</b>	<b>5.0</b>

### Defences

In the case of the student choosing a thesis, the thesis will be evaluated by three people: the student's thesis supervisor from the Department, a second reader from the Department, and an internal third reader who is generally from another Carleton Department but may sometimes come from outside the University. A thesis must be defended orally before the three evaluators. No letter grade is assigned, but notations of Satisfactory and Unsatisfactory are assigned.

In the case of the student choosing a research essay, that essay will be evaluated by two of the Department's faculty members including the supervisor and a second reader, and a letter grade will be assigned. An oral defence of the essay is not required but may be requested by the supervisor or second reader.

### Washington Center Internship Program

The Washington Center Internship Program is open to full time master's students who have completed at least two terms of study at Carleton. Admission is open to students with at least a 9.5 GPA in Political Science graduate courses. Successful completion of the program satisfies the requirements for one term of full-time study (1.5 credits). Students spend one term (fall, winter or summer) in Washington, D.C. They serve four days a week as an intern in Washington, D.C. and also take two seminar courses offered by faculty of The Washington Center. The normal 1.5 credit course load for participants in the program is: PSCI 5904 Washington Center Internship, PSCI 5906 Washington Center Seminar II, PSCI 5906 Washington Center Seminar II. Full information on the program and application forms can be obtained from the Department of Political Science.

### Course Selection

Within the scope of the regulations, 4000-level undergraduate courses in Political Science may be taken by M.A. students.

Students are also encouraged to look for graduate courses at Carleton in the Departments of Economics, Geography, History, Law, Philosophy, and Sociology and Anthropology; the Schools of Business, Journalism and Communication,

Public Administration, and the Norman Paterson School of International Affairs; and in the Institutes of European and Russian Studies, and Political Economy. Students may also look for courses in the Graduate School of Public Policy and International Affairs and the School of Political Science at the University of Ottawa.

All courses selected will be subject to the approval of the Department, on grounds of appropriateness to the program of study and the avoidance of excessive overlap between courses.

### Ph.D. Political Science (5.0 credits)

Details on all program requirements are provided in the departmental Guidelines for Ph.D. Candidates. The student may choose to take a maximum of 0.5 credit outside the Department of Political Science.

#### Requirements:

**1. 2.0 credits in** courses at the 6000 level in each of the candidate's two major fields of study. A GPA of 9.0 or higher must be obtained in these courses for students to be allowed to proceed to the comprehensive examinations. 2.0

**2. 1.0 credit in:** 1.0

PSCI 6900 [0.5]	Ph.D. Field Examination I
PSCI 6905 [0.5]	Ph.D. Field Examination II

Field examinations normally take place once per year, in August. At the discretion of the Department, candidates may be required to take an oral examination following the written examination. Full-time students are normally required to complete the comprehensive examinations within 24 months of entering the program.

**3. 1.0 credit in** electives at the graduate level, normally taken during the first or second year of the program, in fields allied to the major topics of the thesis. This credit will normally be fulfilled through regular course work rather than tutorials. A maximum of .5 credits can be fulfilled by tutorials. 1.0

**4. 1.0 credit in:** 1.0

PSCI 6907 [0.5]	Thesis Proposal Workshop I
PSCI 6908 [0.5]	Thesis Proposal Workshop II

5. An oral defence of a written dissertation proposal. Full-time students must normally complete the oral defence of the proposal, preceded by its formal acceptance by the supervisory committee, in the third year of their doctoral program.

**6. 0.0 credits in:** 0.0

PSCI 6909 [0.0]	Ph.D. Thesis
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**Total Credits** **5.0**

### Ph.D. Political Science with Collaborative Specialization in African Studies (5.5 credits)

#### Requirements:

**1. 2.0 credits in** courses at the 6000 level in each of the candidate's two major fields of study. A GPA of 9.0 or higher must be obtained in these courses for students to be allowed to proceed to the comprehensive examinations. 2.0

**2. 1.0 credit in:** 1.0

PSCI 6900 [0.5]	Ph.D. Field Examination I
PSCI 6905 [0.5]	Ph.D. Field Examination II

Field examinations normally take place once per year, in August. At the discretion of the Department, candidates may be required to take an oral examination following the written examination. Full-time students are normally required to complete the comprehensive examinations within 24 months of entering the program.

**3. 0.0 credit in:** 0.0

AFRI 5800 [0.0] Scholarly Preparation in African Studies

**4. 1.0 credit in:** 1.0

AFRI 5000 [0.5] African Studies as a Discipline: Historical and Current Perspectives

AFRI 6000 [0.5] Thinking from Africa: Historical Perspectives, Contemporary Dimensions

**5. 0.5 credit in** electives at the graduate level, in fields allied to major topics of the thesis. This credit will normally be fulfilled through regular course work rather than tutorials. 0.5

**6. 1.0 credit in:** 1.0

PSCI 6907 [0.5] Thesis Proposal Workshop I

PSCI 6908 [0.5] Thesis Proposal Workshop II

**7.** An oral defence of a written dissertation proposal. Full-time students must normally complete the oral defence of the proposal, preceded by its formal acceptance by the supervisory committee, in the third year of their doctoral program.

**8. 0.0 credits in:** 0.0

PSCI 6909 [0.0] Ph.D. Thesis (in the specialization)

**Total Credits** 5.5

### Ph.D. Political Science with Collaborative Specialization in African Studies (Advanced Completion Option - 5.0 credits)

Applicants to the Ph.D. Political Science with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies may be considered for admission to an Advanced Completion Option of the Ph.D.

#### Requirements:

**1. 2.0 credits in** courses at the 6000 level in each of the candidate's two major fields of study. A GPA of 9.0 or higher must be obtained in these courses for students to be allowed to proceed to the comprehensive examinations. 2.0

**2. 1.0 credit in:** 1.0

PSCI 6900 [0.5] Ph.D. Field Examination I

PSCI 6905 [0.5] Ph.D. Field Examination II

**3. 0.5 credit in:** 0.5

AFRI 6000 [0.5] Thinking from Africa: Historical Perspectives, Contemporary Dimensions

**4. 0.5 credit in** electives at the graduate level, in fields allied to the major topics of the thesis. This credit will normally be fulfilled through regular course work rather than tutorials. 0.5

**5. 1.0 credit in:** 1.0

PSCI 6907 [0.5] Thesis Proposal Workshop I

PSCI 6908 [0.5] Thesis Proposal Workshop II

**6.** An oral defence of a written dissertation proposal. Full-time students must normally complete the oral defence of the proposal, preceded by its formal acceptance by the supervisory committee, in the third year of their doctoral program.

**7. 0.0 credit in:**

PSCI 6909 [0.0] Ph.D. Thesis (in the specialization)

**Total Credits** 5.0

### Ph.D. Political Science with Collaborative Specialization in Political Economy (5.0 credits)

#### Requirements:

**1. 2.0 credits in** courses at the 6000 level in each of the candidate's two major fields of study 2.0

**2. 1.0 credit in:** 1.0

PSCI 6900 [0.5] Ph.D. Field Examination I

PSCI 6905 [0.5] Ph.D. Field Examination II

Field examinations normally take place once per year, in August. At the discretion of the Department, candidates may be required to take an oral examination following the written examination. Full-time students are normally required to complete the comprehensive examinations within 24 months of entering the program.

**3.** Proficiency in a research skill, as outlined below under Research Skill Requirement

**4. 0.5 credit in:** 0.5

PECO 6000 [0.5] Political Economy: Core Concepts

**5. 0.5 credit in:** 0.5

A relevant political economy course from the approved list

**6. 1.0 credit in:** 1.0

PSCI 6907 [0.5] Thesis Proposal Workshop I

PSCI 6908 [0.5] Thesis Proposal Workshop II

**7.** An oral defence of a written dissertation proposal. Full-time students must normally complete the oral defence of the proposal, preceded by its formal acceptance by the supervisory committee, in the third year of their doctoral program.

**8. 0.0 credits in:** 0.0

PSCI 6909 [0.0] Ph.D. Thesis (in the specialization)

**Total Credits** 5.0

### Regulations

See the General Regulations section of this Calendar.

All master's candidates must obtain a B standing or higher (GPA 8.0). One grade of C+ may be allowed.

### Regulations

See the General Regulations section of this Calendar.

Details on all program requirements are provided in the departmental Guidelines for Ph.D. Candidates.

All Ph.D. candidates will fulfill a 10.0-credit program requiring departmental approval. The student may choose to take a maximum of 0.5 credit outside the Department of Political Science.

## Admission

The normal requirement for admission to the master's program is B.A.(Honours) (or the equivalent) in Political Science, with at least high honours standing.

The Faculty of Graduate and Postdoctoral Affairs requires applicants whose native language is not English to be tested for proficiency in English. Applicants to the Political Science graduate program must meet the General Regulations requirements.

Applicants must have completed some political theory at the undergraduate level, or will be required to take PSCI 5310 History of Political Thought. This 0.5 credit counts toward the normal MA program requirements of 5.0 credits.

Applicants must have completed a social science research methods course at the undergraduate level, regardless of their desired field of specialization, or will be required to take PSCI 5700 Basic Research Methods or PSCI 5705 Approaches to the Study of Political Theory. This 0.5 credit counts toward the normal M.A. program requirements of 5.0 credits.

Honours graduates in fields other than political science will be considered on the basis of their academic background and standing, and will be judged on a case-by-case basis. Those with only minor deficiencies may be required to take certain specified courses, while others whose degrees are less closely related to political science may be required to register in the qualifying year, at the discretion of the Department. Graduates of three-year programs in political science will be required either to complete the fourth year of an honours degree and reapply, or register in the qualifying year, depending on work completed to date and academic standing. The qualifying year is intended only for those students (with at least an 8.0 grade point average) whose universities do not offer an Honours degree or for graduates in other fields who did not major in political science. The qualifying year program is not intended to be a method for improving a student's undergraduate record. Admission to the qualifying-year program does not imply automatic admission to the master's program.

### Accelerated Pathway

The accelerated pathway in the Department of Political Science is a flexible and individualized plan of graduate study. Students in their final year of a Carleton B.A. Honours degree in Political Science with demonstrated academic excellence and aptitude for research may qualify for this option.

Students in their third year of study in the B.A. Honours degree in Political Science should consult with both the Undergraduate Supervisor and the Graduate Supervisor to determine if the accelerated pathway is appropriate for them and to discuss the selection of courses for their final year of undergraduate studies.

### Accelerated Pathway Requirements

1. At least 0.5 credit in PSCI courses at the 5000#level with a grade of B+ or higher.
2. Minimum overall CGPA of 10.5.

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

## Admission

The Ph.D. program in political science normally will be undertaken on a full-time basis. However, in cases of exceptional merit, the Department may accept a few candidates for the degree on a part-time basis.

The normal requirement for admission to the Ph.D. program is a master's degree (or its equivalent) in political science with high honours standing or better.

Ph.D. candidates must have completed a political theory course at the undergraduate or master's level, regardless of their desired field of specialization, or will be required to take PSCI 5310 History of Political Thought. This 0.5 credit counts toward the normal Ph.D. program requirements of 5.0 credits.

Ph.D. candidates must have completed a social science research methods course at either the undergraduate level or master's level, regardless of their desired field of specialization, or will be required to take PSCI 5700 Basic Research Methods or PSCI 5705 Approaches to the Study of Political Theory. This 0.5 credit counts toward the normal Ph.D. program requirements of 5.0 credits.

The Faculty of Graduate Studies and Postdoctoral Affairs requires applicants whose native language is not English to be tested for proficiency in English. Applicants to the Political Science graduate program must meet the General Regulations requirements.

Upon entry to the program, each Ph.D. candidate will be assigned a faculty member to advise them on their studies. Students' programs, including the choice of supervisor and the thesis committee, must be approved by the Department. The thesis supervisor will normally be chosen from among faculty members in the Department of Political Science. Upon approval of the thesis supervisor and the Department, committee members may be chosen from elsewhere within the University.

### Co-operative Education

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

### Application Requirements

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

### Participation Requirements

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.

- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

### **Co-op Participation Agreement**

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

### **Communication with the Co-op Office**

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

### **Graduation with the Co-op Designation**

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

### **Employment**

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

### **Work Term Assessment and Evaluation**

#### **Work Term Evaluation**

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

#### **Work Term Assessment**

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

### **Voluntary Withdrawal from the Co-op Option**

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

### **Involuntary or Required Withdrawal from the Co-op Option**

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### **International Students**

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

### **Co-op Fees**

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

### **Political Science**

#### **Co-operative Education Option**

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the M.A. in Political Science;
2. have successfully completed, by the start-date of the first work term, 2.5 credits of required courses;
3. be registered as a full-time student in each academic term prior to a work term;
4. be eligible to work in Canada (for off-campus work terms)

For more information, please refer to the Co-operative Education Policy.

## **Political Science (PSCI) Courses**

### **PSCI 5003 [0.5 credit]**

#### **Political Parties in Canada**

A seminar on political parties and party systems in Canadian federal politics, including an examination of patterns of historical development, party organization and finance, relationships with social movements, and the impact of Canadian federalism.

### **PSCI 5006 [0.5 credit]**

#### **Legislatures and Representation in Canada**

The role of Parliament and of the individual M.P. in terms of policy making, party discipline, and differing conceptions of representation.

Also offered at the undergraduate level, with different requirements, as PSCI 4006, for which additional credit is precluded.

### **PSCI 5009 [0.5 credit]**

#### **Canadian Political Economy**

A seminar on political economy as a traditional and contemporary approach to the study of Canadian politics and the Canadian state. Canada's economic development, social relations (including gender and race relations), and position in the international political economy is explored.

### **PSCI 5010 [0.5 credit]**

#### **Executive Power in Canadian Politics**

Consideration of prime ministers, premiers, cabinet ministers and senior public service leadership in Canadian politics and government.

Also listed as PSCI 4010.

### **PSCI 5100 [0.5 credit]**

#### **Indigenous Activism on Turtle Island: Take That, Colonialism!**

Issues of governance regarding the original peoples of Canada, Mexico and the United States since the European invasion. Contemporary movements for restoration of cultural, political, socio-economic, land and self-governance rights, emphasizing domestic and international strategies.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as PSCI 4206, for which additional credit is precluded.

### **PSCI 5101 [0.5 credit]**

#### **Canadian Federalism**

A study of the evolution and contemporary operation of the Canadian federal system, noting particularly the specific social, political, economic, and structural features which underlie its operational performance, its resilience in crisis, and its potential for adaptation.

Also offered at the undergraduate level, with different requirements, as PSCI 4005, for which additional credit is precluded.

### **PSCI 5103 [0.5 credit]**

#### **Canada-EU Relations**

Relations between Canada and Europe in the context of European integration, with attention to policy issues affecting the relationship and/or areas of common policy challenges.

Also listed as EURR 5108.

Prerequisite(s): previous course in European integration or permission of the instructor.

### **PSCI 5107 [0.5 credit]**

#### **Globalization, Adjustment and Democracy in Africa**

The nature of global pressures in Africa as states go through a "second wind" of political and economic change.

Also offered at the undergraduate level, with different requirements, as PSCI 4207, for which additional credit is precluded.

### **PSCI 5110 [0.5 credit]**

#### **Post-Soviet States and Societies**

The relationship between social forces and state structures at both the national and local levels in the USSR and the post-soviet states.

Also listed as EURR 5002.

Also offered at the undergraduate level, with different requirements, as EURR 4002, for which additional credit is precluded.

### **PSCI 5111 [0.5 credit]**

#### **The European Union and its Eastern Neighbours**

The EU's European Neighbourhood Policy and Eastern partnership policy, the Russia-EU "strategic partnership". Policies and reactions of non-EU East European countries toward the EU. The interaction of Member state policies and EU policies. May include attention to historical legacies, cultural factors, public opinion, energy security.

Includes: Experiential Learning Activity

Also listed as EURR 5205, INAF 5807.

**PSCI 5112 [0.5 credit]****Russian Domestic Politics**

Examination of the evolution of Russian domestic politics and society since the collapse of the Soviet Union. Themes discussed include the transformation of Russia's political system, changes in the behavior of political elites, the evolution of Russia's social structure, and federal-regional relations.

Also listed as EURR 5101.

**PSCI 5113 [0.5 credit]****Democracy in the European Union**

Survey of empirical research and normative theorizing about democracy in the EU. Topics include: European Parliament and other channels for democratic input, patterns of citizen participation, impact of European integration on democracy in EU member states, Euroscepticism, theories of EU democracy.

Also listed as EURR 5113.

**PSCI 5114 [0.5 credit]****The Politics of Israel/Palestine**

The history and politics of Israel/Palestine. An examination of the interests and identities of Israelis and Palestinians, and the role of external actors and public opinion in shaping regional dynamics.

**PSCI 5200 [0.5 credit]****Nationalism**

A seminar on the historical and comparative study of nationalism, with emphasis on its role in the promotion of political change.

Includes: Experiential Learning Activity

**PSCI 5201 [0.5 credit]****Politics in Plural Societies**

A seminar on politics in multicultural societies and multi-national states, including settler and post-colonial societies. Topics may include: conflict relating to race, religion, language, regionalism, intra-state nationalism, multicultural policies and theories of pluralism.

**PSCI 5202 [0.5 credit]****Development Theory and Issues**

A seminar on historical and current debates in development theory, including the origins, nature, and critiques of development processes in the Global South.

**PSCI 5203 [0.5 credit]****Southern Africa After Apartheid**

An exploration of the pathology of apartheid, the reasons for its end, and prospects for democratization and development in southern Africa in the era of globalization. Also offered at the undergraduate level, with different requirements, as PSCI 4203, for which additional credit is precluded.

**PSCI 5204 [0.5 credit]****Fighting for Votes**

Election campaign dynamics and election outcomes, with emphasis on the strategies and actions of voters, parties, and candidates. Attention to concepts of representation, accountability, and legitimacy.

Also offered at the undergraduate level, with different requirements, as PSCI 4204, for which additional credit is precluded.

**PSCI 5207 [0.5 credit]****International Political Sociology**

A seminar exploring classical and contemporary social and political thought in relation to international, transnational, and global practices and institutions. Topics may include borders, capitalism, citizenship, civil society, constitutionalization, empire, governance, power, public spheres, risk, security, sovereignty, and world society.

**PSCI 5208 [0.5 credit]****Global Social Policy**

The seminar explores global initiatives in poverty reduction, inequality, development assistance and internationalization of the provision of social services. The seminar considers theoretical, institutional and policy implications of debates about global justice, policy transfer and global government of social policies.

**PSCI 5209 [0.5 credit]****Forced Migration and Global Politics**

Critical examination of the relationship between different aspects of forced migration and debates within global politics. Topics may include borders, global governance, political agency, sovereignty, security, globalization, gender and public policy.

Includes: Experiential Learning Activity

**PSCI 5210 [0.5 credit]****Politics and Popular Culture**

A critical examination of the increasingly important intersections of politics and popular culture. Theoretical approaches such as structuralism, semiotics, political economy, feminism, and postmodernism explore such core themes as political power, dissent, globalization, (post)colonialism, gender, race, class, and sexuality in various media.

**PSCI 5211 [0.5 credit]****Migration, Globalization and Governance**

Critical examination of the politics of mobility in a globalizing context. Seminar topics may include migration regimes, securitization of migration, temporary and permanent migration streams and patterns of inclusion and exclusion.

**PSCI 5212 [0.5 credit]****Advanced International Relations Theory**

Close reading and analysis of theoretical research in the academic discipline of International Relations; may include analysis of methodology, normative and critical theory, and key theoretical concepts such as anarchy, sovereignty, power, inequality, coloniality, security, gender.

**PSCI 5302 [0.5 credit]****Democratic Theories**

Analysis of various theories of democracy and community, from classical to modern.

**PSCI 5303 [0.5 credit]****Genealogies of Politics and Governance**

Examination of Foucault's genealogical method for doing critical studies of politics and governance. Topics may include governmentality, sovereignty, biopolitics, neoliberalism, citizenship, and colonialism. Also listed as SOCI 5407.

Also offered at the undergraduate level, with different requirements, as PSCI 4303, for which additional credit is precluded.

**PSCI 5305 [0.5 credit]****Political Thought in the Modern Muslim Middle East**

Contemporary political thought in the Muslim Middle East. Secular and religious responses to the challenges of modernity. Readings may include writings of Arab, Turkish, and Iranian intellectuals.

Also offered at the undergraduate level, with different requirements, as PSCI 4302, for which additional credit is precluded.

**PSCI 5308 [0.5 credit]****Concepts of Political Community I**

A critical survey of concepts of political community, including the common good, justice, citizenship, statesmanship, democracy, and legitimacy, from ancient, modern, and contemporary political theory. Also offered at the undergraduate level, with different requirements, as PSCI 4318, for which additional credit is precluded.

**PSCI 5309 [0.5 credit]****Concepts of Political Community II**

A continued critical survey of concepts of political community, including the common good, justice, citizenship, statesmanship, democracy, and legitimacy, from ancient, modern, and contemporary political theory. Prerequisite(s): PSCI 5308 or permission of the Department.

Also offered at the undergraduate level, with different requirements, as PSCI 4319, for which additional credit is precluded.

**PSCI 5310 [0.5 credit]****History of Political Thought**

Western political thought from classical times to the nineteenth century: may include the study of Plato, Aristotle, Machiavelli, Hobbes, Locke, Rousseau, Marx and other thinkers.

**PSCI 5315 [0.5 credit]****Politics and the Study of History**

An exploration of the relationship between history and politics. Will examine different forms of history and historical writing, competing conceptions of how to interpret the past, and different accounts of how history is implicated in political judgment and understanding politics. Also offered at the undergraduate level, with different requirements, as PSCI 4315, for which additional credit is precluded.

**PSCI 5407 [0.5 credit]****Reproductive Rights Policy in North America**

The interaction between social movements, legislatures and courts in formulating reproductive rights policy in Canada, the U.S. and Mexico.

Also offered at the undergraduate level, with different requirements, as PSCI 4403, for which additional credit is precluded.

**PSCI 5410 [0.5 credit]****Postcolonial Theories and Practices**

This seminar familiarizes students with different approaches to postcolonial theory, discussing issues like the decolonization of knowledge and development and examining colonial practices of states and responses by indigenous movements.

**PSCI 5501 [0.5 credit]****Selected Issues in Political Economy I**

A research seminar exploring a selected topic of current research having a political economy perspective, such as power and stratification; dynamics of state action; contrasting views on administration as an instrument of political economy; culture, ideology, and social relations; and the labour process.

Also listed as PECO 5501, SOCI 5404.

**PSCI 5502 [0.5 credit]****Selected Issues in Political Economy II**

A research seminar exploring a selected topic of current research having a political economy perspective, such as power and stratification; dynamics of state action; contrasting views on administration as an instrument of political economy; culture, ideology, and social relations; and the labour process.

Also listed as PECO 5502, SOCI 5505.

**PSCI 5504 [0.5 credit]****Selected Topics in Work and Labour I**

Topics and emphasis vary from term to term according to current policies and events influencing the distribution and benefits of work and labour including migration, technological and environmental change, privatization, austerity, and transnational legislation.

Also listed as PECO 5503, SOCI 5503.

**PSCI 5505 [0.5 credit]****Selected Topics in Work and Labour II**

Topics and emphasis vary from term to term according to current policies and events influencing the distribution and benefits of work and labour including migration, technological and environmental change, privatization, austerity, and transnational legislation.

Also listed as PECO 5504, SOCI 5502.

**PSCI 5506 [0.5 credit]****Gender and Politics**

Selected gender dimensions of politics in a comparative perspective. Topics may include: gendered nature of authority, gender regimes and state forms, feminist accounts of citizenship, representation, power and democracy, women's movements and anti-feminist movements, identity politics, gendered accounts of nationalism and multiculturalism.

**PSCI 5600 [0.5 credit]****Africa's International Relations**

Africa's international relations, analyzing interactions between nation-states, the continent and the world, and Africa's diaspora considering history, theories, and current issues. Topics include diplomacy, security, political economy, and global governance.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as PSCI 4600, for which additional credit is precluded.

**PSCI 5602 [0.5 credit]****Ethics in International Relations**

Historical and contemporary approaches to normative theory and ethics in international relations, including Kantian, Hegelian, Marxist, postmodern and feminist ethics. Issues may include poverty and justice, human rights and humanitarian intervention.

**PSCI 5607 [0.5 credit]****Politics of North America**

Continentalism in Canadian foreign policy during the twentieth century, charting regional, economic, political, and defence relations in North America.

Precludes additional credit for PSCI 4607 if taken before 2006-07.

**PSCI 5608 [0.5 credit]****European Integration and European Security**

A seminar focusing on issues related to the formation of supra-national decision-making structures in Europe.

Includes: Experiential Learning Activity

Also listed as EURR 4104/5104.

Also offered at the undergraduate level, with different requirements, as PSCI 4608, for which additional credit is precluded.

**PSCI 5609 [0.5 credit]****Selected Topics in European Integration Studies**

A seminar focusing on selected topics related to European integration in the post-World War II period.

Also listed as EURR 5106.

**PSCI 5700 [0.5 credit]****Basic Research Methods**

A course in applied research design and methodology, with emphasis on empirical research strategies that are amenable to quantification.

**PSCI 5701 [0.5 credit]****Intermediate Polimetrics for Micro Data**

Intermediate research designs and statistical techniques primarily used in analyzing survey data. Selected topics may vary from year to year. Students intending to do research based on micro data are advised to take this course.

Prerequisite(s): PSCI 5700 or permission of the Department.

Also offered at the undergraduate level, with different requirements, as PSCI 4701, for which additional credit is precluded.

**PSCI 5702 [0.5 credit]****Intermediate Research Methods for Applied Political Science**

Applied methods for policy, politics and public affairs. Primarily quantitative but may have qualitative elements. Prerequisite(s): PSCI 5700 or permission of the Department.

Also offered at the undergraduate level, with different requirements, as PSCI 4702, for which additional credit is precluded.

**PSCI 5703 [0.5 credit]****Ethnographic Research Methods**

Introduction to ethnographic and related qualitative research methods in political science. Ethnography is the study of culture and social organization primarily through participant observation, supplemented by interviewing, archival research, and collection of audiovisual materials.

**PSCI 5705 [0.5 credit]****Approaches to the Study of Political Theory**

This course explores different methodological approaches to the study of texts in political theory. It examines the essential methodological considerations that are involved in designing and conducting a study in political theory.

**PSCI 5802 [0.5 credit]****Global Money Rules**

An exploration of the organization of the global monetary and financial system. Issues covered include the relationship between global finance and the state, the politics of world money, and the problems associated with regulating internationally-active financial institutions.

Includes: Experiential Learning Activity

Also offered at the undergraduate level, with different requirements, as PSCI 4805, for which additional credit is precluded.

**PSCI 5803 [0.5 credit]****NATO and World Order**

NATO as a political and military alliance. NATO and 21st century changes in world order. Broader transatlantic security issues.

Also offered at the undergraduate level, with different requirements, as PSCI 4806, for which additional credit is precluded.

**PSCI 5805 [0.5 credit]****Foreign Policy Analysis**

A research seminar dealing with selected problems in the study of foreign policy formulations and outcomes.

**PSCI 5806 [0.5 credit]****Strategic Thought and Issues in International Security**

A research seminar on the evolution of classical and contemporary strategic thought, and on current issues in international security.

**PSCI 5807 [0.5 credit]****Analysis of International Organizations**

A research seminar on process and change in contemporary forms of international organization.

**PSCI 5808 [0.5 credit]****International Political Economy**

A seminar on current issues in IPE. Topics include theoretical issues in the disciplinary history of IPE and recent developments in the organization and operation of the global political economy in the fields of money, finance, production, work, trade, knowledge, geopolitical rivalry and empire.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**PSCI 5810 [0.5 credit]****Approaches to Environmental Politics**

Theoretical and methodological approaches to research in the field of environmental politics, including but not limited to public policy research. A variety of institutionalist, political economy, political ecology, and post-modern approaches will be examined.

**PSCI 5900 [1.0 credit]****Tutorial in a Selected Field**

Tutorials or reading courses on selected topics may be arranged with the permission of the Department. Students cannot accumulate more than 1.0 credit in tutorials towards their degree requirements.

**PSCI 5901 [0.5 credit]****Tutorial in a Selected Field**

Tutorials or reading courses on selected topics may be arranged with the permission of the Department. Students cannot accumulate more than 1.0 credit in tutorials towards their degree requirements.

**PSCI 5904 [0.5 credit]****Washington Center Internship**

A one-term internship in the NAFTA Leaders Program of The Washington Center, offered in Washington D.C.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**PSCI 5905 [0.5 credit]****Washington Center Seminar I**

A seminar offered by The Washington Center.  
Prerequisite(s): permission of the Department.

**PSCI 5906 [0.5 credit]****Washington Center Seminar II**

A seminar offered by The Washington Center.  
Prerequisite(s): permission of the Department.

**PSCI 5908 [1.0 credit]****M.A. Research Essay**

Tutorial for students who write a research essay rather than a thesis.

Includes: Experiential Learning Activity

**PSCI 5909 [2.0 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

**PSCI 5913 [0.0 credit]****Co-operative Work Term**

Students may register in the co-op option according to the guidelines listed under Co-op Option in the Calendar of Graduate Studies.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**PSCI 5915 [0.5 credit]****Special Topics in Political Science**

A seminar on a selected topic in political science, to be determined by faculty, research, and teaching interests.

**PSCI 6000 [0.5 credit]****The Political Process in Canada I**

An analytical study of the democratic political process, with particular reference to political parties and elections, pressure groups, and political leadership in Canada.

**PSCI 6001 [0.5 credit]****The Political Process in Canada II**

An analytical study of the democratic political process, with particular reference to political parties and elections, pressure groups, and political leadership in Canada.

**PSCI 6105 [0.5 credit]****Comparative Politics I**

A research seminar dealing with theories, methods, and problems of comparison.

**PSCI 6106 [0.5 credit]****Comparative Politics II**

A research seminar dealing with particular themes.

**PSCI 6200 [0.5 credit]****Theorizing Gender and Diversity**

This course will provide students with the theoretical and methodological approaches necessary to study gender and diversity in the context of politics. The course will include feminist political theories, critical race theory, postcolonial theory, theories from sexuality studies and political economy.

**PSCI 6201 [0.5 credit]****Gender and Diversity: Comparative and International Politics**

Topics may include: representation and electoral politics; reproductive rights; social policy and welfare regimes; governance, resistance and transition; citizenship and migration; health and environment; security and violence (including sexual violence), and analysis of reproductive, informal and formal labour.

**PSCI 6300 [0.5 credit]****Political Theory I**

An intensive examination of the major questions in classical, medieval, modern, and contemporary political philosophy. This course is historically comprehensive in scope and thematically oriented in depth.

**PSCI 6301 [0.5 credit]****Political Theory II**

An intensive examination of the major questions in classical, medieval, modern, and contemporary political philosophy. This course is historically comprehensive in scope and thematically oriented in depth.

**PSCI 6407 [0.5 credit]****Public Policy: Theory and Analysis**

Introduction to major theoretical approaches in the study and analysis of public policy and to current topics and debates in the field.

**PSCI 6408 [0.5 credit]****Public Affairs Management and Analysis**

A seminar on theories and practice in the management of public affairs, including the environment and administration of the public sector, public opinion, and public communications.

**PSCI 6600 [0.5 credit]****Theory and Research in International Politics I**

An examination of the principal problems in contemporary international relations theory and research, emphasizing the state of the field and current directions in it.

**PSCI 6601 [0.5 credit]****Theory and Research in International Politics II**

An examination of the principal problems in contemporary international relations theory and research, emphasizing the state of the field and current directions in it.

**PSCI 6900 [0.5 credit]****Ph.D. Field Examination I**

Ph.D. preparation for the major field examination I. The grade to be awarded will be that obtained on the field examination.

**PSCI 6905 [0.5 credit]****Ph.D. Field Examination II**

Ph.D. preparation for the major field examination II. The grade to be awarded will be that obtained on the field examination.

**PSCI 6907 [0.5 credit]****Thesis Proposal Workshop I**

A survey of research methods and approaches to research design designed to assist in the preparation of thesis proposals. Coordinated by one instructor, but faculty from other fields will also participate. The grade for this course will be Satisfactory or Unsatisfactory. Prerequisite(s): permission of the Department.

**PSCI 6908 [0.5 credit]****Thesis Proposal Workshop II**

Student-led workshop focused on the preparation, presentation, and discussion of drafts of students' thesis proposals. The final assignment for the course will be the presentation of a full written draft of the thesis proposal. Graded Satisfactory or Unsatisfactory. Includes: Experiential Learning Activity. Prerequisite(s): successful completion of comprehensive examinations or permission of the Department.

**PSCI 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Psychology

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This section presents the requirements for programs in:

- **M.A. Psychology**
- **M.A. Psychology with Concentration in Mental Health and Well-Being**
- **M.A. Psychology with Collaborative Specialization in Climate Change**
- **M.A. Psychology with Collaborative Specialization in Data Science**
- **Ph.D. Psychology**
- **Ph.D. Psychology with Concentration in Quantitative Methodology**

**Program Requirements****M.A. Psychology (5.0 credits)****Requirements:**

<b>1. 1.0 credit in</b> PSYC 5410 and PSYC 5411 (recommended to complete during the first two terms of program)	<b>1.0</b>
<b>2. 1.0 credit in</b> PSYC at the 5000-level in Content courses - OR - 0.5 credit in PSYC at the 5000-level from Content courses and 0.5 credit in Elective Stats or Professional Development	<b>1.0</b>
<b>3. Completion of:</b>	<b>0.0</b>
PSYC 5906 [0.0] Pro-Seminar in Psychology	
<b>4. 0.5 credit from</b> the following professional development courses:	<b>0.5</b>
PSYC 5002 [0.5] Ethics in Psychology	
PSYC 5003 [0.5] Open Science and Methodological Improvements	
PSYC 5004 [0.5] Knowledge Mobilization	
PSYC 5802 [0.5] Special Topics: Professional Development	
PSYC 5903 [0.5] Practicum in Psychology	
<b>5. 2.5 credits in:</b>	<b>2.5</b>
PSYC 5909 [2.5] M.A. Thesis (which must be defended at an oral examination)	
<b>Total Credits</b>	<b>5.0</b>

**Note:** courses for each research area are listed on the departmental website: [carleton.ca/psychology](http://carleton.ca/psychology).

**M.A. Psychology  
with Concentration in Mental Health and Well-Being (5.0 credits)**

Students who fulfil the requirements for the Concentration in Mental Health and Well-Being may request the designation appear on their transcript in their last term of their MA program.

**Requirements:**

<b>1. 1.0 credit in</b> PSYC 5410 and PSYC 5411 (recommended to complete during the first two terms of the program) <sup>1</sup>	<b>1.0</b>
<b>2. 0.5 credit in:</b> <sup>1</sup>	<b>0.5</b>
PSYC 5209 [0.5] Topics in Health Psychology or other health-oriented course approved by the Graduate Supervisor	
<b>3. 0.5 credit from:</b>	<b>0.5</b>

PSYC 5107 [0.5]	Psychology of Family Violence	
PSYC 5208 [0.5]	Advances in Positive Psychology	
PSYC 5804 [0.5]	Special Topics in Health Psychology	
PSYC 5900 [0.5]	Directed Studies	
PSYC 5901 [0.5]	Independent Research	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
PSYC 5904 [0.5]	Community Mental Health and Well-Being Practicum	
<b>5. Completion of:</b>		<b>0.0</b>
PSYC 5905 [0.0]	Applied Community Mental Health and Well-Being	
PSYC 5906 [0.0]	Pro-Seminar in Psychology	
<b>6. 2.5 credits in:</b>		<b>2.5</b>
PSYC 5909 [2.5]	M.A. Thesis (which must be defended at an oral examination)	
<b>Total Credits</b>		<b>5.0</b>

#### Note 1

Students must receive a minimum grade of A- in PSYC 5410, PSYC 5411, and PSYC 5209 (or its approved replacement) in order to complete the concentration.

### M.A. Psychology with Collaborative Specialization in Climate Change (5.5 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in PSYC 5410 and PSYC 5411</b> (recommended to complete during the first two terms of the program)		<b>1.0</b>
<b>4. 0.5 credit from Professional Development courses:</b>		<b>0.5</b>
PSYC 5002 [0.5]	Ethics in Psychology	
PSYC 5003 [0.5]	Open Science and Methodological Improvements	
PSYC 5004 [0.5]	Knowledge Mobilization	
PSYC 5802 [0.5]	Special Topics: Professional Development	
PSYC 5903 [0.5]	Practicum in Psychology	
<b>5. 0.5 credit in PSYC at the 5000-level, excluding Professional Development courses listed above, and excluding Elective Statistics courses</b>		<b>0.5</b>
<b>6. 0.0 credit in:</b>		
PSYC 5906 [0.0]	Pro-Seminar in Psychology	
<b>7. 2.5 credits in:</b>		<b>2.5</b>
PSYC 5909 [2.5]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.5</b>

### M.A. Psychology with Collaborative Specialization in Data Science (5.0 credits)

#### Notes:

- Students must receive a minimum grade of A in each of the courses included in the Specialization.
- Courses for each research area are listed on the departmental website: [carleton.ca/psychology](http://carleton.ca/psychology).

#### Requirements:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
PSYC 5410 [0.5]	Foundations of the General Linear Model	
PSYC 5411 [0.5]	Extension of the General Linear Model	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 0.5 credit in PSYC at the 5000 level, excluding the professional development courses listed in Item 4 and excluding the elective statistics courses listed below.</b>		<b>0.5</b>
<b>4. 0.5 credit from the following professional development courses:</b>		<b>0.5</b>
PSYC 5000 [0.5]	Introduction to Program Evaluation	
PSYC 5002 [0.5]	Ethics in Psychology	
PSYC 5003 [0.5]	Open Science and Methodological Improvements	
PSYC 5004 [0.5]	Knowledge Mobilization	
PSYC 5802 [0.5]	Special Topics: Professional Development	
PSYC 5903 [0.5]	Practicum in Psychology	
<b>5. Completion of:</b>		<b>0.0</b>
PSYC 5906 [0.0]	Pro-Seminar in Psychology	
<b>6. 2.5 credits in:</b>		<b>2.5</b>
PSYC 5909 [2.5]	M.A. Thesis (in the area of Data Science, which must be defended at an oral examination)	
<b>Total Credits</b>		<b>5.0</b>

### Ph.D. Psychology (3.0 credits)

#### Requirements:

<b>1. 1.0 credit in:</b>		<b>1.0</b>
PSYC 5410 [0.5]	Foundations of the General Linear Model	
PSYC 5411 [0.5]	Extension of the General Linear Model	
<b>2. 0.5 credit in Elective Statistics courses (listed below):</b> or other, as approved by the graduate committee.		<b>0.5</b>
<b>3. 1.0 credit in graduate level PSYC courses, excluding the professional development courses listed in Item 4 and excluding the elective statistics courses listed below.</b>		<b>1.0</b>
<b>4. 0.5 credit from the following professional development courses:</b>		<b>0.5</b>
PSYC 5000 [0.5]	Introduction to Program Evaluation	
PSYC 5002 [0.5]	Ethics in Psychology	
PSYC 5003 [0.5]	Open Science and Methodological Improvements	
PSYC 5004 [0.5]	Knowledge Mobilization	
PSYC 5802 [0.5]	Special Topics: Professional Development	
PSYC 6104 [0.5]	Seminar in University Teaching	
PSYC 6114 [0.5]	Teaching Practicum	
PSYC 6903 [0.5]	Practicum in Psychology	
<b>5. Completion of:</b>		
PSYC 6906 [0.0]	Pro-Seminar in Psychology I	
PSYC 6907 [0.0]	Pro-Seminar in Psychology II	
<b>6. 0.0 credits in:</b>		<b>0.0</b>
PSYC 6909 [0.0]	Ph.D. Thesis (must be defended at an oral examination)	

7. All Ph.D. candidates are required to submit a thesis prospectus. The prospectus examination will normally be successfully completed within seven calendar terms of the student's initial registration for full-time students and ten terms for part-time students

**Total Credits** **3.0**

**Note:** courses for each research area are listed at the departmental website: [carleton.ca/psychology](http://carleton.ca/psychology).

### Ph.D. Psychology with Concentration in Quantitative Methodology (3.0 credits)

#### Requirements:

#### 1. 1.0 credit in:

PSYC 5410 [0.5] Foundations of the General Linear Model

PSYC 5411 [0.5] Extension of the General Linear Model

#### 2. 1.0 credit in Elective Statistics courses (listed below) or other as approved by the graduate committee

#### 3. 0.5 credit in:

PSYC 6410 [0.5] Capstone Research Project in Quantitative Methods

#### 4. 0.5 credit from the following professional development courses:

PSYC 5000 [0.5] Introduction to Program Evaluation

PSYC 5002 [0.5] Ethics in Psychology

PSYC 5003 [0.5] Open Science and Methodological Improvements

PSYC 5004 [0.5] Knowledge Mobilization

PSYC 5802 [0.5] Special Topics: Professional Development

PSYC 6104 [0.5] Seminar in University Teaching

PSYC 6114 [0.5] Teaching Practicum

PSYC 6903 [0.5] Practicum in Psychology

#### 5. Completion of:

PSYC 6906 [0.0] Pro-Seminar in Psychology I

PSYC 6907 [0.0] Pro-Seminar in Psychology II

#### 6. 0.0 credits in:

PSYC 6909 [0.0] Ph.D. Thesis (must be defended at an oral examination)

All Ph.D. candidates are required to submit a thesis prospectus. The prospectus examination will normally be successfully completed within seven calendar terms of the student's initial registration for full-time students and ten terms for part-time students.

**Total Credits** **3.0**

#### Notes:

- Students must receive a minimum grade of A in each of the courses included in the Concentration.
- Registration in PSYC 6410 will occur after the other 2.0 credits have been completed and after a proposed research project has been approved by the Department.
- Upon completion of the Concentration's requirements, the student will request an in-program change from a PhD in Psychology to a PhD in Psychology with a Concentration in Quantitative Methodology.

- Courses for each research area are listed on the departmental website: [carleton.ca/psychology](http://carleton.ca/psychology).

### Psychology Elective Statistics Courses

PSYC 5001 [0.5] Qualitative Research Methods in Psychology

PSYC 5401 [0.5] Multivariate Techniques

PSYC 5407 [0.5] Scale Development and Psychometrics

PSYC 5412 [0.5] Topics in Advanced Statistics and Methods

PSYC 5413 [0.25] Workshops in Advanced Statistics and Methods

PSYC 5414 [0.5] Structural Equation Modeling

PSYC 5415 [0.5] Multilevel Modeling

PSYC 5416 [0.5] Advanced Survey Methods

PSYC 5417 [0.5] Categorical Data Analysis

PSYC 5801 [0.5] Special Topics: Statistics

### Regulations

See the General Regulations section of this Calendar.

### Regulations

See the General Regulations section of this Calendar.

The minimum program requirements for the Ph.D. degree in Psychology include 10.0 credits with a grade of B- or higher in each course

### Admission Requirements

The normal requirement for admission into the master's programs is a B.A. Honours Psychology (or equivalent) with high honours standing, completion of a research thesis, and credit in a breadth of courses in line with the psychology major.

Candidates with particular course deficiencies may be required to register in additional courses at Carleton.

### Qualifying Year

Occasionally, candidates with exceptional promise who offer less than Honours B.A. status may be admitted to a qualifying-year program approved by the graduate studies committee and designed to prepare them for master's study. A grade of B- or better must be obtained in each qualifying-year course, and candidates may be required to complete satisfactorily the equivalent of a B.A.(Honours) thesis.

### Admission

The requirements for admission to the Ph.D. program are outlined in the General Regulations section of this Calendar. Scores on the Graduate Record Examination are optional.

The Ph.D. program in psychology normally will be undertaken on a full-time basis; however, in cases of exceptional merit, the Department will accept a few candidates for the degree on a part-time basis.

## **Psychology (PSYC) Courses**

### **PSYC 5000 [0.5 credit]**

#### **Introduction to Program Evaluation**

An introduction to theories and methods used in program evaluation, including social programs and organizational change initiatives. Topics may include program theory, logic model development, research designs for evaluations, and evaluation utilization.

Includes: Experiential Learning Activity

### **PSYC 5001 [0.5 credit]**

#### **Qualitative Research Methods in Psychology**

Introduction to various non-numerical, interpretive research methods. Attention will be devoted to the philosophical underpinnings of qualitative research, methods collecting and analyzing qualitative data, and issues regarding sampling, reliability, and validity.

Includes: Experiential Learning Activity

### **PSYC 5002 [0.5 credit]**

#### **Ethics in Psychology**

Ethical concepts and controversies related to research and practice in psychology. Topics may include ethical dilemmas and debates, professional codes of ethics, confidentiality, informed consent, legal rights and responsibilities, use of deception, or guidelines for research with special populations.

### **PSYC 5003 [0.5 credit]**

#### **Open Science and Methodological Improvements**

Exploring recent debates around reproducibility and openness in psychology. Practical objectives involving the improvement of research practices, publication strategies, and evaluation of past findings. Topics may include basic issues in measurement, statistical inference, ethics, and philosophy of science.

### **PSYC 5004 [0.5 credit]**

#### **Knowledge Mobilization**

Knowledge Mobilization encompasses a wide variety of activities designed to support the flow of knowledge from creators (e.g., researchers) to users (e.g., policy makers) and back. This course explores theory and practice concerning the creation, synthesis, sharing, and uptake of knowledge, and communication skills.

### **PSYC 5005 [0.5 credit]**

#### **Psychology of Solitude**

Psychological theory and research related to the costs and benefits of solitude, from several different psychological perspectives, throughout the lifespan from childhood to old age, and situated within a broad range of contexts including schools, natural environments, cyberspace, and across cultures.

### **PSYC 5011 [0.5 credit]**

#### **Topics in Social Psychology**

A critical examination of scientific theory and research in social psychology. Topics may include social cognition, social influence, group processes, conflict resolution and social change.

### **PSYC 5012 [0.5 credit]**

#### **Topics in Organizational Psychology**

A critical examination of scientific theory and research in organizational psychology. Topics may include personnel selection, work motivation, morale and productivity, organizational decision making, leadership and social action.

### **PSYC 5015 [0.5 credit]**

#### **Methods in Social and Personality Psychology**

An overview of traditional and emerging research methods in social and personality psychology. Students will learn a variety of experimental and nonexperimental procedures for assessing individual differences, cognitions, emotions, attitudes, and behaviours in the laboratory and the field.

### **PSYC 5020 [0.5 credit]**

#### **Applications of Psychology to Policing and the Courts**

A review of theory and research related to the application of psychology to various components of the criminal justice system, particularly policing and the courts. Topics may include criminal investigations, police use of force, eyewitness testimony and identification, victim rights, and jury decision making.

Includes: Experiential Learning Activity

### **PSYC 5021 [0.5 credit]**

#### **Forensic Assessment**

Theoretical and empirical issues of the biopsychosocial antecedents of criminal behaviour. Classification and assessment of offenders for courts, probation and parole services. Risk assessment, management and service planning are addressed in both correctional and mental health contexts.

Includes: Experiential Learning Activity

### **PSYC 5022 [0.5 credit]**

#### **Adult Offenders**

Theoretical and empirical issues on the use of different types of interventions in modifying adult criminal behaviour. Institutional treatment and community-based approaches are discussed.

**PSYC 5024 [0.5 credit]****Juvenile Delinquency**

An examination of the development of delinquency with a focus on etiology, risk factors, assessment, prediction, and developmental trajectories. Individual, group, and family institutional and community treatment approaches are examined.

**PSYC 5025 [0.5 credit]****Topics in Forensic Psychology: Theory and Research**

In-depth examination of theories and research in forensic psychology. Police stress, eyewitness memory, and risk assessment; theories and research that inform the assessment, treatment, and management of offenders.

**PSYC 5026 [0.5 credit]****Topics in Forensic Psychology: Methodology**

Overview of research methods in forensic psychology. Topics may include research ethics, the use of archival records, observational and interview techniques, questionnaire development, reaction time studies, longitudinal designs, and the analysis of physiological data.

**PSYC 5027 [0.5 credit]****Sex Offenders**

Fundamentals of theory and research on sexual offenders. Critical thinking about evidence. Readings on key topics and a review of the methodology commonly used.

**PSYC 5028 [0.5 credit]****Police Psychology**

Critical examination of theory, methods, and research in the area of police psychology. Topics include evidence based policing, police recruitment and selection, police stress, police investigations, use of force, police discretion, and police management and leadership.

**PSYC 5029 [1.0 credit]****Cold Case Investigations**

Forensic science, criminal justice, psychology, and investigative techniques equip students with knowledge and practical skills required to tackle unsolved crimes. Expert academics and practitioners will present in the first semester, and in the second semester students actively participate in solving an unsolved cold case.

Includes: Experiential Learning Activity

Prerequisite(s): graduate level standing.

Also offered at the undergraduate level, with different requirements, as PSYC 4411, for which additional credit is precluded.

**PSYC 5104 [0.5 credit]****Psychology of Women**

This seminar will consider and evaluate research concerning the psychology of women, including research methods, gender roles and gender differences.

**PSYC 5107 [0.5 credit]****Psychology of Family Violence**

Biopsychosocial antecedents and consequences of the abuse and neglect of children, partners and elders within the family. The efficacy of preventive and treatment strategies is also assessed, as are current controversies and research methods in the area.

**PSYC 5208 [0.5 credit]****Advances in Positive Psychology**

Overview and critical analysis of current theory and research in positive psychology; application of principles in organizations, schools, and the community. Topics may include positive youth development, perspectives on psychological wellness and growth, positive emotions, resilience, and mindfulness.

**PSYC 5209 [0.5 credit]****Topics in Health Psychology**

A critical examination of scientific theory and research in health psychology. Topics may include the biopsychological model of illness, stress and coping, psychoneuroimmunology, personality, and stress management.

**PSYC 5300 [0.5 credit]****Perceptual Processes**

Theoretical and empirical issues of the area of perception. Topics may include: psychophysics, constancies, depth perception, pattern recognition, iconic memory, attention, hemispheric specialization.

**PSYC 5301 [0.5 credit]****Psychophysics**

A study of classic and contemporary psychophysical methods. Applications to cognition will be included.

**PSYC 5401 [0.5 credit]****Multivariate Techniques**

Applications of multivariate statistical techniques with psychological data including multivariate analysis of variance, canonical correlation, discriminant function analysis, and factor analysis. Extensive use is made of statistical software.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5410 and PSYC 5411.

**PSYC 5407 [0.5 credit]****Scale Development and Psychometrics**

This course will typically be designed to provide an in-depth understanding of the process of psychological scale development with respect to both the classical (i.e., reliability, validity) and the more modern (item response theory) psychometric approaches.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5410 or permission of the department.

**PSYC 5410 [0.5 credit]****Foundations of the General Linear Model**

Structure of the GLM; decomposition of variance into explained (model/groups) and unexplained (error/residual) parts; correlation; simple linear regression with categorical (one-way ANOVA) and continuous predictors; hypothesis testing - sampling distributions, p-values, test statistics; confidence intervals; ANCOVA and multiple regression; model assumptions and regression diagnostics.

Includes: Experiential Learning Activity

**PSYC 5411 [0.5 credit]****Extension of the General Linear Model**

Hierarchical model building and R-squared change; regression artifacts and regression to the mean; factorial ANOVA and regression moderation; corrections for post-hoc and other multiple testing situations (e.g., Tukey); random effects/repeated measures; mediation analysis; power and effect size.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5410.

**PSYC 5412 [0.5 credit]****Topics in Advanced Statistics and Methods**

Selected topics in advanced statistics and research methods relevant to broad areas of psychology, varying from year to year. Topics may include broad analytic approaches, such as, program evaluation, qualitative methods, nonparametric statistics, among others.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5410 and PSYC 5411. This course also requires permission of the Department.

**PSYC 5413 [0.25 credit]****Workshops in Advanced Statistics and Methods**

Intensive focus on specific statistical or methodological approaches relevant to psychological research such as advanced factor analysis, meta-analysis, observational methods.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5410 and PSYC 5411. This course also requires permission of the Department.

**PSYC 5414 [0.5 credit]****Structural Equation Modeling**

An in depth examination of structural equation modeling (SEM) techniques. SEM involves the integration of path analysis and factor analysis. Basic issues such as model fitting and identification will be covered as well as more applied issues surrounding mediation and moderation testing in SEM.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5410 and PSYC 5411. This course also requires permission of the Department.

**PSYC 5415 [0.5 credit]****Multilevel Modeling**

An in depth examination of multilevel modeling (MLM). Students will develop the skills required to interpret and conduct multi-level data analysis, including longitudinal and nested designs, using hierarchical linear modeling software. The primary focus will be on two- level and three-level hierarchies.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5410 and PSYC 5411. This course also requires permission of the Department.

**PSYC 5416 [0.5 credit]****Advanced Survey Methods**

Analysis of data from complex sample designs, including the development of selection and non-response weights, methods for handling and imputing missing data, the effects of stratification and clustering on estimation, and methods of variance estimation for complex sample designs.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5410 or permission of the department.

**PSYC 5417 [0.5 credit]****Categorical Data Analysis**

This course will provide students with an in-depth understanding of several statistical techniques that can be used to analyze categorical data. Topics include contingency tables, log-linear analysis, logistic regression analysis with categorical predictors, continuous predictors, and interaction terms, and receiver operator characteristic (ROC) analysis.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5410 or permission of the department.

**PSYC 5500 [0.5 credit]****Topics in Developmental Psychology: Methodology**

A critical examination of methodology in developmental psychology. Topics may include observational and interview techniques, use of archival data, longitudinal designs, questionnaire development, and basic assessment methods. A research project will be required.

Includes: Experiential Learning Activity

**PSYC 5503 [0.5 credit]****Advanced Topics in Developmental Psychology:  
Social and Emotional Development**

Recent developments in developmental psychology theory and research related to the study of social and emotional development. Topics may include child temperament, parenting and the family, peer relationships, self-system, and developmental psychopathology.

**PSYC 5504 [0.5 credit]****Advanced Topics in Developmental Psychology:  
Cognitive Development**

Recent developments in developmental psychology theory and research related to the study of cognitive development. Topics may include: language, literacy, numeracy, and theory of mind.

**PSYC 5505 [0.5 credit]****Topics in Developmental Psychology: Theory and Research**

Critical examination of scientific theory and research in developmental psychology. Special attention will be given to the mechanisms that account for change. Although most theories speak to the developmental of children, students will also have the opportunity to investigate theories of ageing.

**PSYC 5601 [0.5 credit]****Topics in Personality Psychology**

Current debates in personality research, with contemporary theoretical and research papers in personality. Topics may include the structure of personality and its evolutionary, experiential, biological, social, and cultural processes.

**PSYC 5700 [0.5 credit]****Advanced Topics in Cognition I**

An in-depth study of a specific topic in the area of basic cognitive processes. Topics will vary from year to year and may include judgmental processes, object identification, selective attention and spatial cognition.

**PSYC 5703 [0.5 credit]****Topics in Cognitive Psychology**

A critical examination of scientific theory and research in cognitive psychology. Topics may include detection and processing of sensory signals, pattern recognition, attention, mental imagery and automaticity.

**PSYC 5800 [0.5 credit]****Special Topics in Psychology**

The topics of this course will vary from year to year, and will be announced in advance of the registration period.

**PSYC 5801 [0.5 credit]****Special Topics: Statistics**

The topics of this course will vary from year to year, and will be announced in advance of the registration period. Prerequisite(s): PSYC 5410 or permission of the department.

**PSYC 5802 [0.5 credit]****Special Topics: Professional Development**

The topics of this course will vary from year to year, and will be announced in advance of the registration period.

**PSYC 5804 [0.5 credit]****Special Topics in Health Psychology**

The topics of this course will vary from year to year, and will be announced in advance of the registration period.

**PSYC 5900 [0.5 credit]****Directed Studies**

In-depth investigation of selected problems in psychology by means of directed library research. Registration is restricted, permission to register being granted only by the graduate committee. A final report must be filed in the departmental office prior to submission of course grade. Includes: Experiential Learning Activity

**PSYC 5901 [0.5 credit]****Independent Research**

Permission to register and approval of research plan must be obtained from the graduate committee. A final research report must be filed in the departmental office prior to submission of course grade. The course may be repeated for credit. Includes: Experiential Learning Activity

**PSYC 5903 [0.5 credit]****Practicum in Psychology**

The practicum offers master's level students the opportunity to gain experience in a range of applied psychology settings with the goal of integrating academic and practical aspects of psychology. This course cannot be repeated for credit. Students will receive a grade of satisfactory or unsatisfactory. Includes: Experiential Learning Activity

**PSYC 5904 [0.5 credit]****Community Mental Health and Well-Being Practicum  
Graded Sat/Uns.**

Includes: Experiential Learning Activity  
Prerequisite(s): PSYC 5410 and 0.5 credit from PSYC 5001, PSYC 5407, PSYC 5411, PSYC 5416, PSYC 5417 and PSYC 5801 with a grade of A- or higher and PSYC 5209 or other health-oriented course approved by the graduate supervisor, with a grade of A- or higher; and approval of the graduate supervisor.

**PSYC 5905 [0.0 credit]****Applied Community Mental Health and Well-Being**

Students will have an opportunity to engage with the discipline outside the classroom, to develop professional skills associated with success in the workplace, and increase awareness of and sensitivity to the mental health and well-being of those around them.

Includes: Experiential Learning Activity

Prerequisite(s): PSYC 5904.

**PSYC 5906 [0.0 credit]****Pro-Seminar in Psychology**

The pro-seminar is based on the departmental invited colloquia series. This course provides breadth in terms of exposure to research. Colloquia are offered from September to April.

**PSYC 5909 [2.5 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

**PSYC 6101 [0.5 credit]****Advanced Topics in Social Psychology**

A higher-level critical examination of scientific theory and research in social psychology. Topics are taken from recent publications and debates in the discipline.

**PSYC 6102 [0.5 credit]****Advanced Topics in Organizational Psychology**

A higher-level critical examination of scientific theory and research in organizational psychology. Topics are taken from recent publications and debates in the discipline.

**PSYC 6104 [0.5 credit]****Seminar in University Teaching**

Theoretical and empirical work related to teaching in higher education. Analysis of instructional discourse, use of language in classroom decision-making, bases of effective practice and methods of instruction. Constructivist principles of teaching and learning. Role of teaching in university scholarship.

Also offered at the undergraduate level, with different requirements, as ALDS 5204., for which additional credit is precluded.

**PSYC 6114 [0.5 credit]****Teaching Practicum**

The purpose of this course is to provide doctoral students who have an interest in developing their teaching skills with the opportunity for mentored practice within the discipline of psychology. Graded SAT/UNS.

Includes: Experiential Learning Activity

**PSYC 6410 [0.5 credit]****Capstone Research Project in Quantitative Methods**

Conduct an independent quantitative data analysis project that demonstrates a student's mastery of advanced quantitative techniques. This project may involve practical experience with an organization or agency when the principal activity extends the student's knowledge of quantitative techniques.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**PSYC 6700 [0.5 credit]****Advanced Topics in Cognition II**

An in-depth study of a specific topic in higher-level cognitive processes. Topics will vary from year to year and may include mathematical knowledge and processes, problem solving, or models of reading.

**PSYC 6704 [0.5 credit]****Advanced Topics in Cognitive Psychology**

A higher-level critical examination of scientific theory and research in cognitive psychology. Topics are taken from recent publications and debates in the discipline.

Precludes additional credit for PSYC 5704 (no longer offered).

**PSYC 6800 [0.5 credit]****Special Topics in Psychology**

The topics of this course will vary from year to year, and will be announced in advance of the registration period.

**PSYC 6900 [0.5 credit]****Directed Studies**

In-depth investigation of selected problems in psychology by means of directed library research. Registration is restricted, permission to register being granted only by the graduate committee. A final report must be filed in the departmental office prior to submission of course grade.

Includes: Experiential Learning Activity

**PSYC 6901 [0.5 credit]****Independent Research**

Permission to register and approval of research plan must be obtained from the graduate committee. A final research report must be filed in the departmental office prior to submission of course grade. The course may be repeated for credit.

Includes: Experiential Learning Activity

**PSYC 6903 [0.5 credit]****Practicum in Psychology**

The practicum offers Ph.D. students the opportunity to gain experience in a range of applied psychology settings with the goal of integrating academic and practical aspects of psychology. This course cannot be repeated for credit. Students will receive a grade of satisfactory or unsatisfactory.

Includes: Experiential Learning Activity

**PSYC 6906 [0.0 credit]****Pro-Seminar in Psychology I**

The pro-seminar is based on the departmental invited colloquia series. This course provides breadth in terms of exposure to research. Colloquia are offered from September to April.

Includes: Experiential Learning Activity

**PSYC 6907 [0.0 credit]****Pro-Seminar in Psychology II**

The pro-seminar is based on the departmental invited colloquia series. This course provides breadth in terms of exposure to research. Colloquia are offered from September to April.

Includes: Experiential Learning Activity

**PSYC 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Public Policy and Administration

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This section presents the requirements for programs in:

- **Master of Public Policy and Administration**
- **Master of Public Policy and Administration with Collaborative Specialization in Climate Change**
- **Master of Public Policy and Administration with Collaborative Specialization in Data Science**
- **Master of Public Policy and Administration with Concentration in Indigenous Policy and Administration**
- **Master of Public Policy - Sustainable Energy and the Environment**
- **Master of Public Policy - Sustainable Energy and the Environment with Collaborative Specialization in Climate Change**
- **Ph.D. Public Policy**
- **Ph.D. Public Policy with Collaborative Specialization in Political Economy**
- **Graduate Diploma in Indigenous Policy and Administration**
- **Graduate Diploma in Public Policy and Program Evaluation**

**Program Requirements****Master of Public Policy and Administration (7.0 credits)****Requirements - Coursework pathway (Standard Admission, 7.0 credits)**

<b>1. 4.5 credits in core courses:</b>		<b>4.5</b>
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 2.5 credits in approved electives (see School website for details)</b>		<b>2.5</b>
<b>Total Credits</b>		<b>7.0</b>

**Requirements - Research essay pathway (Standard Admission, 7.0 credits)**

<b>1. 4.5 credits in core courses:</b>		<b>4.5</b>
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	

PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 1.5 credits in approved electives (see School website for details)</b>		1.5
<b>3. 1.0 credit in:</b>		1.0
PADM 5908 [1.0]	Research Essay	
<b>Total Credits</b>		<b>7.0</b>

#### **Requirements - Thesis pathway (Standard Admission, 7.0 credits)**

<b>1. 4.5 credits in core courses:</b>		4.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in approved elective (see School website for details)</b>		0.5
<b>3. 2.0 credits in:</b>		2.0
PADM 5909 [2.0]	M.P.P.A. Thesis	
<b>Total Credits</b>		<b>7.0</b>

#### **Master of Public Policy and Administration (Advanced Completion Option - 5.0 credits)**

##### **Requirements - Coursework pathway (Advanced completion option, 5.0 credits)(See Note, below)**

<b>1. 2.5 credits in core courses from:</b>		2.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 2.5 credits in approved electives (see School website for details)</b>		2.5
<b>Note:</b>		
Additional credits may be required, as specified on offer of admission.		
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research essay pathway (Advanced completion option, 5.0 credits)(See Note, below)**

<b>1. 2.5 credits in core courses from:</b>		2.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 1.5 credits in approved electives (see School website for details)</b>		1.5
<b>3. 1.0 credit in:</b>		1.0
PADM 5908 [1.0]	Research Essay	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Thesis pathway (Advanced completion option, 5.0 credits)(See Note, below)**

<b>1. 2.5 credits in core courses from:</b>		2.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in approved electives (see School website for details)</b>		0.5
<b>3. 2.0 credits in:</b>		2.0
PADM 5909 [2.0]	M.P.P.A. Thesis	
<b>Total Credits</b>		<b>5.0</b>

#### **Master of Public Policy and Administration with Collaborative Specialization in Climate Change (7.0 credits)**

##### **Requirements - coursework pathway (7.0 credits)**

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		0.0
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 4.5 credits in core courses:</b>		4.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	

PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>4. 1.0 credits in</b>	approved climate change electives (see School website for details)	1.0
<b>5. 0.5 credit in</b>	approved electives (see School website for details)	0.5
<b>Total Credits</b>		<b>7.0</b>

#### Requirements - research essay pathway (7.0 credits)

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		0.0
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 4.5 credits in</b>	core courses:	4.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>4. 1.0 credit in:</b>		1.0
PADM 5908 [1.0]	Research Essay (in the Specialization)	
<b>5. 0.5 credit in</b>	approved electives (see School website for details)	0.5
<b>Total Credits</b>		<b>7.0</b>

### Master of Public Policy and Administration with Collaborative Specialization in Data Science (7.0 credits)

#### Requirements - Coursework pathway:

<b>1. 4.0 credits in</b>	core courses:	4.0
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 1.5 credits in</b>	data science core courses:	1.5

DATA 5000 [0.5]	Introduction to Data Science	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5218 [0.5]	Analysis of Socio-economic Data	
<b>3. 0.5 credit from</b>	data science electives:	0.5
COMP 5111 [0.5]	Data Management for Business Intelligence	
COMP 5209 [0.5]	Visual Analytics	
COMP 5305 [0.5]	Advanced Database Systems	
COMP 5306 [0.5]	Data Integration	
PADM 5372 [0.5]	Policy Seminar (Data Science Specialization)	
PADM 5391 [0.5]	Directed Studies (Data Science Specialization)	
<b>4. 1.0 credit in</b>	approved elective (see School website for details)	1.0
<b>Total Credits</b>		<b>7.0</b>

#### Requirements - Research essay pathway:

<b>1. 4.0 credits in</b>	core courses:	4.0
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 1.5 credits in</b>	data science core courses:	1.5
DATA 5000 [0.5]	Introduction to Data Science	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5218 [0.5]	Analysis of Socio-economic Data	
<b>3. 0.5 credit in</b>	approved elective (see School website for details)	0.5
<b>4. 1.0 credit in:</b>		1.0
PADM 5908 [1.0]	Research Essay (on a Data Science topic approved by the MPPA Graduate Supervisor and the Data Science governance committee)	
<b>Total Credits</b>		<b>7.0</b>

### Master of Public Policy and Administration with Collaborative Specialization in Data Science (Advanced completion, 5.0 credits)

#### Requirements - Coursework pathway (Advanced completion, 5.0 credits):

<b>1. 2.5 credits from</b>	core courses:	2.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	

PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5218 [0.5]	Analysis of Socio-economic Data	
<b>4. 0.5 credit from data science electives:</b>		<b>0.5</b>
COMP 5111 [0.5]	Data Management for Business Intelligence	
COMP 5209 [0.5]	Visual Analytics	
COMP 5305 [0.5]	Advanced Database Systems	
COMP 5306 [0.5]	Data Integration	
PADM 5372 [0.5]	Policy Seminar (Data Science Specialization)	
PADM 5391 [0.5]	Directed Studies (Data Science Specialization)	
<b>5. 1.0 credit in approved elective (see School website for details)</b>		<b>1.0</b>
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Research essay pathway (Advanced completion, 5.0 credits):</b>		
<b>1. 2.5 credits from core courses:</b>		<b>2.5</b>
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in:</b>		<b>0.5</b>
DATA 5000 [0.5]	Introduction to Data Science	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5218 [0.5]	Analysis of Socio-economic Data	
<b>4. 0.5 credit in approved elective (see School website for details)</b>		<b>0.5</b>
<b>5. 1.0 credit in:</b>		<b>1.0</b>
PADM 5908 [1.0]	Research Essay (on a Data Science topic approved by the MPPA Graduate Supervisor and the Data Science governance committee)	
<b>Total Credits</b>		<b>5.0</b>

## Master of Public Policy and Administration with Concentration in Indigenous Policy and Administration (7.0 credits)(7.5 credits - Thesis pathway)

To complete the M.P.P.A. program with a concentration in Indigenous Policy and Administration, students should notify the M.P.P.A. Supervisor when registering for their first year.

### Requirements - Coursework pathway (7.0 credits):

<b>1. 4.5 credits in core courses:</b>		<b>4.5</b>
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
or PADM 5715 [0.5]	Policy Research and Evaluation for Indigenous Policy and Administration	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in approved elective (see School website for details)</b>		<b>0.5</b>
<b>3. 0.5 credit in:</b>		<b>0.5</b>
PADM 5224 [0.5]	Indigenous Policy (must be completed before registering in any of the electives for the IPA concentration in Item 4)	
<b>4. 1.5 credits from:</b>		<b>1.5</b>
PADM 5712 [0.5]	Issues in Contemporary Governance: First Nations, Métis and Inuit	
PADM 5713 [0.5]	Public Administration in Indigenous Organizations and Governments	
PADM 5714 [0.5]	Financial Management in First Nations, Métis and Inuit Governments and Organizations	
PADM 5716 [0.5]	Economic and Community Development in Indigenous Territories	
PADM 5719 [0.5]	Indigenous Health and Social Policy	
PADM 5772 [0.5]	Policy Seminar (Indigenous Policy and Administration)	
PADM 5703 [0.5]	Directed Studies (Indigenous Public Administration)	
<b>Total Credits</b>		<b>7.0</b>
<b>Requirements - Research essay pathway (7.0 credits):</b>		
<b>1. 4.5 credits in core courses:</b>		<b>4.5</b>
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	

PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
or PADM 5715 [0.5]	Policy Research and Evaluation for Indigenous Policy and Administration	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in</b>	approved elective (see School website for details)	0.5
<b>3. 0.5 credit in:</b>		0.5
PADM 5224 [0.5]	Indigenous Policy (must be completed before registering in any of the electives for the IPA concentration in Item 3)	
<b>4. 0.5 credit from:</b>		0.5
PADM 5712 [0.5]	Issues in Contemporary Governance: First Nations, Métis and Inuit	
PADM 5713 [0.5]	Public Administration in Indigenous Organizations and Governments	
PADM 5714 [0.5]	Financial Management in First Nations, Métis and Inuit Governments and Organizations	
PADM 5716 [0.5]	Economic and Community Development in Indigenous Territories	
PADM 5719 [0.5]	Indigenous Health and Social Policy	
PADM 5772 [0.5]	Policy Seminar (Indigenous Policy and Administration)	
PADM 5703 [0.5]	Directed Studies (Indigenous Public Administration)	
<b>5. 1.0 credit in:</b>		1.0
PADM 5908 [1.0]	Research Essay	
<b>Total Credits</b>		<b>7.0</b>

#### Requirements - Thesis pathway (7.5 credits):

<b>1. 4.5 credits in</b>	core courses:	4.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
or PADM 5715 [0.5]	Policy Research and Evaluation for Indigenous Policy and Administration	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in</b>	approved elective (see School website for details)	0.5
<b>3. 0.5 credit in:</b>		0.5

PADM 5224 [0.5]	Indigenous Policy	
<b>4. 2.0 credits in:</b>		2.0
PADM 5909 [2.0]	M.P.P.A. Thesis	
<b>Total Credits</b>		<b>7.5</b>

### Master of Public Policy and Administration with Concentration in Indigenous Policy and Administration (Advanced Completion, 5.0 credits)(5.5 credits - Thesis pathway)

#### Requirements - Coursework pathway (5.0 credits):

<b>1. 2.5 credits in</b>	core courses from:	2.5
PADM 5120 [0.5]	Modern Challenges to Governance	
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
PADM 5122 [0.5]	Public Management: Principles and Approaches	
PADM 5123 [0.5]	Public Management in Practice	
PADM 5125 [0.5]	Qualitative Methods for Public Policy	
or PADM 5715 [0.5]	Policy Research and Evaluation for Indigenous Policy and Administration	
PADM 5126 [0.5]	Quantitative Methods for Public Policy	
PADM 5127 [0.5]	Microeconomics for Policy Analysis	
PADM 5128 [0.5]	Macroeconomics for Policy Analysis	
PADM 5129 [0.5]	Capstone Course	
<b>2. 0.5 credit in</b>	approved elective (see School website for details)	0.5
<b>3. 0.5 credit in:</b>		0.5
PADM 5224 [0.5]	Indigenous Policy (must be completed before registering in any of the electives for the IPA concentration in Item 3)	
<b>4. 1.5 credits from:</b>		1.5
PADM 5711 [0.5]	Indigenous-Canada Relations: Governance and Policy History	
PADM 5712 [0.5]	Issues in Contemporary Governance: First Nations, Métis and Inuit	
PADM 5713 [0.5]	Public Administration in Indigenous Organizations and Governments	
PADM 5714 [0.5]	Financial Management in First Nations, Métis and Inuit Governments and Organizations	
PADM 5716 [0.5]	Economic and Community Development in Indigenous Territories	
PADM 5719 [0.5]	Indigenous Health and Social Policy	
PADM 5772 [0.5]	Policy Seminar (Indigenous Policy and Administration)	
PADM 5703 [0.5]	Directed Studies (Indigenous Public Administration)	

#### Note:

Additional credits may be required, as specified on offer of admission.

<b>Total Credits</b>	<b>5.0</b>
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**Requirements - Research essay pathway (5.0 credits):****1. 2.5 credits in** core courses from: 2.5

PADM 5120 [0.5] Modern Challenges to Governance

PADM 5121 [0.5] Policy Analysis: The Practical Art of Change

PADM 5122 [0.5] Public Management: Principles and Approaches

PADM 5123 [0.5] Public Management in Practice

PADM 5125 [0.5] Qualitative Methods for Public Policy

or PADM 5715 [0.5] Policy Research and Evaluation for Indigenous Policy and Administration

PADM 5126 [0.5] Quantitative Methods for Public Policy

PADM 5127 [0.5] Microeconomics for Policy Analysis

PADM 5128 [0.5] Macroeconomics for Policy Analysis

PADM 5129 [0.5] Capstone Course

**2. 0.5 credit in** approved elective (see School website for details) 0.5**3. 0.5 credit in:** 0.5

PADM 5224 [0.5] Indigenous Policy (must be completed before registering in any of the electives for the IPA concentration in Item 3)

**4. 0.5 credit from:** 0.5

PADM 5711 [0.5] Indigenous-Canada Relations: Governance and Policy History

PADM 5712 [0.5] Issues in Contemporary Governance: First Nations, Métis and Inuit

PADM 5713 [0.5] Public Administration in Indigenous Organizations and Governments

PADM 5714 [0.5] Financial Management in First Nations, Métis and Inuit Governments and Organizations

PADM 5716 [0.5] Economic and Community Development in Indigenous Territories

PADM 5719 [0.5] Indigenous Health and Social Policy

PADM 5772 [0.5] Policy Seminar (Indigenous Policy and Administration)

PADM 5703 [0.5] Directed Studies (Indigenous Public Administration)

**4. 1.0 credit in:** 1.0

PADM 5908 [1.0] Research Essay

**Note:**

Additional credits may be required, as specified on offer of admission.

**Total Credits** 5.0**Requirements - Thesis pathway (5.5 credits):****1. 2.5 credits in** core courses from: 2.5

PADM 5120 [0.5] Modern Challenges to Governance

PADM 5121 [0.5] Policy Analysis: The Practical Art of Change

PADM 5122 [0.5] Public Management: Principles and Approaches

PADM 5123 [0.5] Public Management in Practice

PADM 5125 [0.5] Qualitative Methods for Public Policy

or PADM 5715 [0.5] Policy Research and Evaluation for Indigenous Policy and Administration

PADM 5126 [0.5] Quantitative Methods for Public Policy

PADM 5127 [0.5] Microeconomics for Policy Analysis

PADM 5128 [0.5] Macroeconomics for Policy Analysis

PADM 5129 [0.5] Capstone Course

**2. 0.5 credit in** approved elective (see School website for details) 0.5**3. 0.5 credit in:** 0.5

PADM 5224 [0.5] Indigenous Policy

**4. 2.0 credits in:** 2.0

PADM 5909 [2.0] M.P.P.A. Thesis

**Note:**

Additional credits may be required, as specified on offer of admission.

**Total Credits** 5.5**Master of Public Policy - Sustainable Energy and the Environment (5.0 credits)****Requirements - Coursework pathway:****1. 1.5 credits in:** 1.5

SERG 5002 [0.5] Sustainable Energy Engineering for Policy Students

SERG 5003 [0.5] Energy Evaluation and Assessment Tools

SERG 5005 [0.5] Applied Interdisciplinary Project

**2. 0.0 credit in:** 0.0

SERG 5800 [0.0] Sustainable Energy Seminar

**3. 0.5 credit in:** 0.5

PADM 5121 [0.5] Policy Analysis: The Practical Art of Change

**4. 0.5 credit in:** 0.5

PADM 5510 [0.5] Energy Economics

**5. 0.5 credit in:** 0.5

PADM 5515 [0.5] Sustainable Energy Policy

or PADM 5615 [0.5] Politics and Policy of Energy in Canada

**6. 2.0 credits from** Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor 2.0**Total Credits** 5.0**Requirements - Research essay pathway:****1. 1.5 credits in:** 1.5

SERG 5002 [0.5] Sustainable Energy Engineering for Policy Students

SERG 5003 [0.5] Energy Evaluation and Assessment Tools

SERG 5005 [0.5] Applied Interdisciplinary Project

**2. 0.0 credit in:** 0.0

SERG 5800 [0.0] Sustainable Energy Seminar

**3. 0.5 credit in:** 0.5

PADM 5121 [0.5] Policy Analysis: The Practical Art of Change

**4. 0.5 credit in:** 0.5

PADM 5510 [0.5] Energy Economics

<b>5. 0.5 credit in:</b>	0.5
PADM 5515 [0.5] Sustainable Energy Policy or PADM 5615 [0.5] Politics and Policy of Energy in Canada	
<b>6. 1.0 credits from</b> Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor	1.0
<b>7. 1.0 credit in:</b>	1.0
PADM 5908 [1.0] Research Essay	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Thesis pathway:

<b>1. 1.5 credits in:</b>	1.5
SERG 5002 [0.5] Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5] Energy Evaluation and Assessment Tools	
SERG 5005 [0.5] Applied Interdisciplinary Project	
<b>2. 0.0 credit in:</b>	0.0
SERG 5800 [0.0] Sustainable Energy Seminar	
<b>3. 0.5 credit in:</b>	0.5
PADM 5121 [0.5] Policy Analysis: The Practical Art of Change	
<b>4. 0.5 credit in:</b>	0.5
PADM 5510 [0.5] Energy Economics	
<b>5. 0.5 credit in:</b>	0.5
PADM 5515 [0.5] Sustainable Energy Policy or PADM 5615 [0.5] Politics and Policy of Energy in Canada	
<b>6. 2.0 credits in:</b>	2.0
SERG 5909 [2.0] MA Sustainable Energy Thesis	
<b>Total Credits</b>	<b>5.0</b>

#### Notes:

1. Courses must be appropriate to the student's qualifications and selected with the approval of the student's program supervisor.

### Master of Public Policy - Sustainable Energy and the Environment with Collaborative Specialization in Climate Change (6.0 credits)

#### Requirements - Coursework pathway:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.5 credits in:</b>	1.5
SERG 5002 [0.5] Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5] Energy Evaluation and Assessment Tools	
SERG 5005 [0.5] Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>	0.0
SERG 5800 [0.0] Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>	0.5
PADM 5121 [0.5] Policy Analysis: The Practical Art of Change	
<b>6. 0.5 credit in:</b>	0.5
PADM 5510 [0.5] Energy Economics	
<b>7. 0.5 credit in:</b>	0.5

PADM 5515 [0.5] Sustainable Energy Policy or PADM 5615 [0.5] Politics and Policy of Energy in Canada	
<b>8. 2.0 credits from</b> Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor	2.0
<b>Total Credits</b>	<b>6.0</b>

#### Requirements - Research essay pathway:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.5 credits in:</b>	1.5
SERG 5002 [0.5] Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5] Energy Evaluation and Assessment Tools	
SERG 5005 [0.5] Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>	0.0
SERG 5800 [0.0] Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>	0.5
PADM 5121 [0.5] Policy Analysis: The Practical Art of Change	
<b>6. 0.5 credit in:</b>	0.5
PADM 5510 [0.5] Energy Economics	
<b>7. 0.5 credit in:</b>	0.5
PADM 5515 [0.5] Sustainable Energy Policy or PADM 5615 [0.5] Politics and Policy of Energy in Canada	
<b>6. 1.0 credit from</b> Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor	1.0
<b>8. 1.0 credit in:</b>	1.0
PADM 5908 [1.0] Research Essay (in the specialization)	
<b>Total Credits</b>	<b>6.0</b>

#### Requirements - Thesis pathway:

<b>1. 1.0 credit in:</b>	1.0
CLIM 5000 [1.0] Climate Collaboration	
<b>2. 0.0 credit in:</b>	
CLIM 5800 [0.0] Climate Seminar Series	
<b>3. 1.5 credits in:</b>	1.5
SERG 5002 [0.5] Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5] Energy Evaluation and Assessment Tools	
SERG 5005 [0.5] Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>	0.0
SERG 5800 [0.0] Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>	0.5
PADM 5121 [0.5] Policy Analysis: The Practical Art of Change	
<b>6. 0.5 credit in:</b>	0.5
PADM 5510 [0.5] Energy Economics	
<b>7. 0.5 credit in:</b>	0.5
PADM 5515 [0.5] Sustainable Energy Policy or PADM 5615 [0.5] Politics and Policy of Energy in Canada	
<b>8. 2.0 credits in:</b>	2.0

SERG 5909 [2.0]	MA Sustainable Energy Thesis (in the specialization)	
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**Total Credits** **6.0**

**Notes:**

1. Courses must be appropriate to the student's qualifications and selected with the approval of the student's program supervisor.

**Ph.D. Public Policy (4.5 credits)**

**Requirements:**

<b>1. 2.0 credits in:</b>	<b>2.0</b>
PADM 6010 [0.5]	Current Issues in Public Policy
PADM 6011 [0.5]	Theoretical Foundations of Public Policy
PADM 6012 [0.5]	Policy Process and Institutions
PADM 6013 [0.5]	Research Design for Public Policy
<b>2. 0.5 credit in</b> 5000- or 6000-level research methods, approved by thesis supervisor and PhD program supervisor	<b>0.5</b>
<b>3. 1.0 credit in</b> an area of specialization, approved by thesis supervisor and PhD program supervisor	<b>1.0</b>
<b>4. 0.5 credit in:</b>	<b>0.5</b>
PADM 6900 [0.5]	Ph.D. Comprehensive Examination
<b>5. 0.5 credit in:</b>	<b>0.5</b>
PADM 6201 [0.5]	Doctoral Research Seminar
<b>6. 0.0 credit in:</b>	
PADM 6911 [0.0]	Ph.D. Proposal (includes public defence of written proposal)
<b>7. 0.0 credit in:</b>	<b>0.0</b>
PADM 6909 [0.0]	Ph.D. Thesis (includes oral defence after completion of all other program requirements)
<b>8. Language requirement (Reading knowledge of French. Another language may substitute, if relevant to thesis)</b>	

**Total Credits** **4.5**

**Ph.D. Public Policy with Collaborative Specialization in Political Economy (4.5 credits)**

**Requirements:**

<b>1. 2.0 credits in:</b>	<b>2.0</b>
PADM 6010 [0.5]	Current Issues in Public Policy
PADM 6011 [0.5]	Theoretical Foundations of Public Policy
PADM 6012 [0.5]	Policy Process and Institutions
PADM 6013 [0.5]	Research Design for Public Policy
<b>2. 0.5 credit in</b> research methods, such as PADM 5218 or another research methods course at the 5000 or 6000 level (See Note 1, below)	<b>0.5</b>
<b>3. 0.5 credit in:</b>	<b>0.5</b>
PECO 6000 [0.5]	Political Economy: Core Concepts
<b>4. 0.5 credit in:</b>	<b>0.5</b>
A relevant political economy course from the approved list.	
<b>5. 0.5 credit in:</b>	<b>0.5</b>
PADM 6900 [0.5]	Ph.D. Comprehensive Examination (See Note 2, below)
<b>6. 0.5 credit in:</b>	<b>0.5</b>

PADM 6201 [0.5]	Doctoral Research Seminar (See Note 3, below)
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**7. Public defence of a written thesis proposal**

**8. 0.0 credits in:** **0.0**

PADM 6909 [0.0]	Ph.D. Thesis (in the specialization)
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**9. Language requirement (See Note 5, below)**

**Total Credits** **4.5**

**Notes**

1. **Course components:** The four required courses PADM 6010 Current Issues in Public Policy, PADM 6011 Theoretical Foundations of Public Policy, PADM 6012 Policy Process and Institutions, and PADM 6013 Research Design for Public Policy will normally be taken in the first year of full-time study. The research methods course and specialization courses must be chosen by the student after consultation with, and approval by, the student's thesis supervisor and the Ph.D. Program Supervisor. Graduate courses offered by the School or by other university departments may be approved. When necessary, students must arrange formal permission from the relevant department for admission to courses.
2. **Comprehensive Examination:** Students will write a Comprehensive Examination, normally in the summer term of the first year, after they have successfully completed each of the four required courses PADM 6010 Current Issues in Public Policy, PADM 6011 Theoretical Foundations of Public Policy, PADM 6012 Policy Process and Institutions, and PADM 6013 Research Design for Public Policy with a grade of B- or higher, and with an overall GPA of 9.0 (B+) or higher. The examination will focus on the material presented in the required courses. At the discretion of the examining board, a candidate whose performance is not satisfactory may be asked to take a second written examination.
3. **Doctoral Research Seminar:** Full-time students will normally register in PADM 6201 Doctoral Research Seminar over two terms in their second year of study. As part of the seminar, a research project will be prepared under the direction of the thesis supervisor and be preliminary to and supportive of the Ph.D. Thesis. Possible formats – to be approved by the supervisor – include a comprehensive and critical literature survey, or a self-contained study applying the principles of research design and research methods to an area of inquiry related to the specialization courses.
4. **Thesis:** Following the successful completion of the Comprehensive Examination, students will prepare a formal thesis proposal under a thesis advisory committee. The thesis supervisor will normally be a faculty member from the School of Public Policy and Administration. The proposal will normally be submitted by the end of the summer term of the second year of full-time registration and defended early in the fall term of the third year. The thesis must demonstrate an advanced ability to integrate multiple disciplines into the analysis of public policy. The thesis must be defended at an oral examination.

5. **Language Requirement:** Students will be required to demonstrate a reading knowledge of French. Another language may be substituted for French, if it is relevant to the thesis.

### Graduate Diploma in Indigenous Policy and Administration (3.0 credits)

#### Requirements:

Students must complete:

<b>1. 2.5 credits in:</b>	<b>2.5</b>
PADM 5711 [0.5] Indigenous-Canada Relations: Governance and Policy History	
PADM 5712 [0.5] Issues in Contemporary Governance: First Nations, Métis and Inuit	
PADM 5713 [0.5] Public Administration in Indigenous Organizations and Governments	
PADM 5714 [0.5] Financial Management in First Nations, Métis and Inuit Governments and Organizations	
PADM 5715 [0.5] Policy Research and Evaluation for Indigenous Policy and Administration	
<b>2. 0.5 credit in</b> elective, selected from other PADM courses or those offered by another unit, as approved by the I.P.A. Supervisor.	<b>0.5</b>
<b>Total Credits</b>	<b>3.0</b>

### Graduate Diploma in Public Policy and Program Evaluation (3.0 credits)

The Diploma in Public Policy and Program Evaluation is designed to be completed in sixteen months, while working full-time. The program is divided into two parts: four applied courses; and a two-course practicum.

Students must be registered in the Diploma and have completed the four applied courses before registering in PADM 5445 and PADM 5446.

#### Graduate Diploma in Public Policy and Program Evaluation (3.0 credits)

<b>1. 2.0 credits in</b> required courses	<b>2.0</b>
PADM 5441 [0.5] Introduction to Policy and Program Evaluation	
PADM 5442 [0.5] Quantitative Research Methods in Evaluation	
PADM 5443 [0.5] Qualitative Research Methods in Evaluation	
PADM 5444 [0.5] Benefit-Cost Analysis for Program Evaluation	
<b>2. 1.0 credit in</b> electives approved by the DPE Supervisor	<b>1.0</b>
PADM 5445 [0.5] Program Evaluation Planning and Designs	
PADM 5446 [0.5] Program Evaluation Conduct, Analysis and Reporting	
<b>Total Credits</b>	<b>3.0</b>

#### Admission

Applicants must have an undergraduate or post-graduate degree (or equivalent), with an average of B+ or higher. The level of academic performance and potential

demonstrated within the degree is more important than the discipline. Indeed, students enter the program from a wide variety of backgrounds in the social sciences, humanities, sciences and engineering.

The School also considers mid-career applicants who do not satisfy this grade average requirement, but who have demonstrated professional excellence over at least five years. Such applicants may use their high achievement in several designated university courses as evidence of their academic potential. These university courses are determined on an individual basis in consultation with the M.P.P.A. Supervisor. Contact the School for details.

All applicants must have completed a 0.5 credit university course covering microeconomic theory (ECON 1001 or equivalent) and a 0.5 credit university course in macroeconomic theory (ECON 1002 or equivalent) with an average grade over the two theory courses of B+ or higher. A working knowledge of algebra is also expected.

In some cases, applicants may be admitted to the program despite not having completed these prerequisites, on the condition that the course(s) be extra to the degree requirements and be completed (with the minimum required grade, as discussed above) in the first year of the program. Nevertheless it is strongly recommended that students complete the prerequisites before starting the program, to ensure that their progress through the core courses is unimpeded.

All applicants whose first language is not English must demonstrate proficiency in the English language. (See Section 3.6 of the General Regulations section of this Calendar for details.)

#### Advanced Completion Option

Applicants to the Master of Public Policy and Administration may be considered for admission to an Advanced Completion Option of the Master of Public Policy and Administration based on their demonstrated academic excellence in university courses deemed equivalent to the core courses of the program. This option will be determined on an individual basis in consultation with the M.P.P.A. Supervisor and the Faculty of Graduate and Postdoctoral Affairs and pursuant to Section 6.1 of the General Regulations section of this Calendar. Admission to the Master of Public Policy and Administration Advanced Completion Option may require courses in addition to the 5.0 credit program requirements.

#### Master of Public Policy and Administration Accelerated Pathway

The accelerated pathway in the Master of Public Policy and Administration is a flexible and individualized plan of graduate study. Students in their final year of the Bachelor of Public Affairs and Policy Management who have demonstrated academic excellence and an aptitude for research may qualify. Students in their third year of study in the Bachelor of Public Affairs and Policy Management should consult with both their undergraduate supervisor and the M.P.P.A Supervisor to determine if the accelerated pathway is appropriate for them and to confirm their

selection of courses in their final year of undergraduate study.

### **Accelerated Pathway Requirements**

1. PADM 5000-level courses with a grade of B+ or higher;
2. Minimum overall CGPA of 10.4 in the Bachelor of Public Affairs and Policy Management.

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### **Admission**

Admission will be judged primarily on the applicant's ability to conduct advanced research and to complete the program successfully. Applications should contain at least one essay or paper at the M.A. level written by the applicant, as well as a statement of research interests and potential thesis topics.

Admission requires completion of an M.A. degree in any of public administration, political science, economics, political economy, business administration, law, or similar degree with first class standing (A- average or higher in their M.A. work).

A working knowledge of basic calculus is required for completion of the program. Assistance in acquiring these skills is provided by the program. Students requiring additional assistance should consult the Ph.D. Supervisor.

Applicants must also successfully complete prerequisites in statistics, political science, and economics as described in detail below. These prerequisites may be satisfied by the completion of appropriate course work at the intermediate undergraduate level or higher in each of the subjects listed.

Prerequisites in political science, economics and statistics must be completed prior to entry. Completed courses in political science should be approximately equivalent to PADM 5120 or PADM 5121. With permission of the Ph.D. Supervisor, this requirement may be done, as a directed study in the summer, prior to registration in the program, under the supervision of faculty in the School. Completed courses in economics should be approximately equivalent to PADM 5127. Equivalent courses may be taken at most universities throughout the academic year. Completed course in statistics should be approximately equivalent to PADM 5126. Applicants should seek advice from the Supervisor of the Ph.D. program about whether particular courses are acceptable as prerequisites.

All applicants whose first language is not English must demonstrate proficiency in the English language. (See Section 3.6 of the General Regulations section of this Calendar for details.)

Advanced standing will not normally be granted for any of the required courses described below. If granted, advanced standing will be limited to 1.0 credit.

### **Regulations**

See the General Regulations section of this Calendar.

All candidates are required to obtain a grade of B- or higher in each course in the program.

The Diplomas are designed to be completed in two years while working full-time, although students may take the program on either a part-time or full-time basis.

The Graduate Diploma (Type 2) in Indigenous Policy and Administration may be taken concurrently with another graduate degree at Carleton University.

### **Regulations**

See the General Regulations section of this Calendar.

A grade of B- or higher must normally be obtained in each course credited towards the M.P.P.A. A candidate may, with the recommendation of the M.P.P.A. Supervisor and the approval of the Dean of the Faculty of Graduate and Postdoctoral Affairs, be allowed a grade of C+ in courses totaling 1.0 credit.

### **Regularly Scheduled Break**

For immigration purposes, the summer term (May to August) for the

- Master of Public Policy in Sustainable Energy and the Environment (coursework pathway)
- Master of Public Policy in Sustainable Energy and the Environment with Collaborative Specialization in Climate Change (coursework pathway)

is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### **Regulations**

See the General Regulations section of this Calendar.

### **Co-operative Education**

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

### **Application Requirements**

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

### **Participation Requirements**

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.

- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

### **Co-op Participation Agreement**

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

### **Communication with the Co-op Office**

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

### **Graduation with the Co-op Designation**

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

### **Employment**

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

### **Work Term Assessment and Evaluation**

#### **Work Term Evaluation**

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

#### **Work Term Assessment**

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

### **Voluntary Withdrawal from the Co-op Option**

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

### **Involuntary or Required Withdrawal from the Co-op Option**

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### **International Students**

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

### **Co-op Fees**

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

### **Co-operative Education Option**

#### **Master of Public Policy and Administration**

##### **Co-op option**

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the Master of Public Policy and Administration;
2. have completed the pre-requisites below by the end of the winter term;
3. have successfully completed, by the start-date of the first work term, a total of 3.0 credits in first-year core MPPA courses. For students enrolled in ECON 1001 and/or ECON 1002, only 2.5 credits worth of first-year core MPPA courses must be completed prior to the start-date of the first work term;
4. be registered as a full-time student in each academic term prior to a work term;

5. be eligible to work in Canada (for off-campus work terms)

*For more information, please refer to the Co-operative Education Policy.*

### **Public Administration (PADM) Courses**

#### **PADM 5120 [0.5 credit]**

##### **Modern Challenges to Governance**

Modern challenges to states, citizens, and policy-making, explored with the help of contemporary and historical thinkers. Topics may include: inequality; national security and intelligence gathering; identity; globalization and global finance; trade agreements and property rights; climate change and environmental challenges. Precludes additional credit for PADM 5115 (no longer offered).

#### **PADM 5121 [0.5 credit]**

##### **Policy Analysis: The Practical Art of Change**

Contemporary techniques of policy analysis. Topics may include: risk assessment, policy design, options analysis, and scenario-writing. Precludes additional credit for PADM 5116 (no longer offered).

#### **PADM 5122 [0.5 credit]**

##### **Public Management: Principles and Approaches**

Principles and processes of public-sector management as they function through cabinet-parliamentary government, federalism, the public service and the judiciary. Institutional reforms and changes in the philosophy of public sector management. Precludes additional credit for PADM 5117 (no longer offered).

#### **PADM 5123 [0.5 credit]**

##### **Public Management in Practice**

Contemporary public management practices. Topics may include: financial management, leadership, performance management, organizational design, human resource management, implementation.

#### **PADM 5124 [0.5 credit]**

##### **Law and Ethics**

The legal and normative environment of Canadian public administration, law, institutions and processes. The relationship between ethics, accountability and good governance. Canadian legal history, adjudicative procedures, delegation of powers to public authorities, procedural justice in decision making. Precludes additional credit for PADM 5412 (no longer offered) and PADM 5413 (no longer offered).

#### **PADM 5125 [0.5 credit]**

##### **Qualitative Methods for Public Policy**

Qualitative methods and dimensions of policy research. Topics may include the formulation of research problems, research design and techniques for collecting and managing evidence, and the role of qualitative research in the analysis of public policies and programs. Precludes additional credit for PADM 5715, PADM 5113 (no longer offered).

#### **PADM 5126 [0.5 credit]**

##### **Quantitative Methods for Public Policy**

Descriptive statistics, probability theory and sampling distributions, hypothesis testing of quantitative and qualitative population parameters, and regression analysis. Precludes additional credit for PADM 5114 (no longer offered).

#### **PADM 5127 [0.5 credit]**

##### **Microeconomics for Policy Analysis**

Key concepts in microeconomic theory and their application to public policy. Topics may include incentives, rational choice theory, market structure, welfare economics, and strategic behaviour. Precludes additional credit for PADM 5111 (no longer offered). Prerequisite(s): ECON 1001 or equivalent.

#### **PADM 5128 [0.5 credit]**

##### **Macroeconomics for Policy Analysis**

Theoretical foundations and current policy issues that relate to the level and growth of expenditure and production are analyzed in the Canadian and international context. Precludes additional credit for PADM 5112 (no longer offered). Prerequisite(s): ECON 1002 or equivalent.

#### **PADM 5129 [0.5 credit]**

##### **Capstone Course**

An integrative workshop-based course in which teams of students develop and present strategies to address a policy problem. Includes: Experiential Learning Activity

#### **PADM 5211 [0.5 credit]**

##### **Intergovernmental Relations**

Major cost-sharing and fiscal transfer agreements. The intergovernmental mechanisms for policy and administrative coordination in selected policy fields. Precludes additional credit for PADM 5003 (no longer offered).

**PADM 5212 [0.5 credit]****Civil Society and Public Policy**

The influence of various interests, social movements, voluntary organizations and citizens in the policy process in a Canadian and comparative context.

**PADM 5213 [0.5 credit]****Gender and Public Policy**

The impact of public policy on gender relations and how gender relations shape policy. Topics covered may include gender inequalities in earnings and employment, macroeconomic policy, gender and development, and gender-based analysis.

Precludes additional credit for PADM 4701 and PADM 5701 (no longer offered).

Also offered at the undergraduate level, with different requirements, as PADM 4213, for which additional credit is precluded.

**PADM 5214 [0.5 credit]****Budgetary Policy in the Public Sector**

Selected aspects of the expenditure and revenue budget and budgetary process at all levels of government. Critical review of actual budgets and budgetary processes.

Precludes additional credit for PADM 5103 (no longer offered).

Also offered at the undergraduate level, with different requirements, as PADM 4214, for which additional credit is precluded.

**PADM 5215 [0.5 credit]****Benefit-Cost Analysis**

Benefit-cost analysis and its application to public-sector investment, pricing policy, discount rates, marginal cost and shadow pricing, and the handling of risk and uncertainty.

Prerequisite(s): PADM 5127 or equivalent.

**PADM 5218 [0.5 credit]****Analysis of Socio-economic Data**

Correlation and regression analyses to test hypotheses about the relationships between socio-economic variables.

Prerequisite(s): PADM 5126 or equivalent.

**PADM 5220 [0.5 credit]****Regulation and Public Policy**

Political, economic, legal, and organizational theories of regulation in the Canadian and comparative context. Processes and consequences of regulatory practice in selected Canadian public policy fields.

Also offered at the undergraduate level, with different requirements, as PADM 4220, for which additional credit is precluded.

**PADM 5221 [0.5 credit]****Health Policy in Canada**

Canadian health policies and programs set in a comparative political-economic and institutional context. Also offered at the undergraduate level, with different requirements, as PADM 4221, for which additional credit is precluded.

**PADM 5222 [0.5 credit]****Economics and Health Policy**

This course applies microeconomic theory to a discussion of health policy. Focus on issues of particular interest to a student of Canadian health care policy.

Prerequisite(s): PADM 5127 or equivalent.

**PADM 5223 [0.5 credit]****Canadian Economic Policy**

Overview of Canadian economic development and how it has been affected by governments. Topics may be drawn from monetary, fiscal, industrial, trade, labour market or competition policies, viewed in contemporary and historical contexts.

Prerequisite(s): PADM 5128 or equivalent.

**PADM 5224 [0.5 credit]****Indigenous Policy**

Canadian policies and programs on Indigenous peoples and Indigenous peoples' own policies as nations set in a comparative political-economic and institutional context. Precludes additional credit for PADM 5711, PADM 4806 (no longer offered) and PADM 5806 (no longer offered). Also offered at the undergraduate level, with different requirements, as PADM 4224, for which additional credit is precluded.

**PADM 5225 [0.5 credit]****Trade Policy**

Canadian multilateral and regional trade policies and programs set in a comparative political-economic and institutional context.

Prerequisite(s): PADM 5127 or equivalent.

Also offered at the undergraduate level, with different requirements, as PADM 4225, for which additional credit is precluded.

**PADM 5226 [0.5 credit]****Tax Policy**

Canadian tax policies set in a comparative political-economic and institutional context.

Prerequisite(s): PADM 5127 or equivalent.

Also offered at the undergraduate level, with different requirements, as PADM 4226, for which additional credit is precluded.

**PADM 5227 [0.5 credit]****Education Policy**

Canadian policies and programs on education set in a comparative political-economic and institutional context. Also offered at the undergraduate level, with different requirements, as PADM 4227, for which additional credit is precluded.

**PADM 5228 [0.5 credit]****Social Policy**

The nature and historical development of social programs in capitalist countries, with particular focus on Canada.

The course will concentrate on developing a critical understanding of the social forces shaping these programs.

Also offered at the undergraduate level, with different requirements, as PADM 4228, for which additional credit is precluded.

**PADM 5229 [0.5 credit]****The Health of Populations**

Assessment of the medical model, and perspectives on the social and economic determinants of health, population health, and community health. The health of particular groups in Canada (e.g., women, Aboriginal peoples). International comparisons will be made.

**PADM 5230 [0.5 credit]****Ethics for Public Policy**

The development and application of ethical theories to examine not simply what governments could do, but what they should do on the basis of consequences, principles, or motivations. Applications could include policies affecting climate change, income inequality, end of life, privacy, use of force.

Also offered at the undergraduate level, with different requirements, as PADM 4230, for which additional credit is precluded.

**PADM 5291 [0.5 credit]****Directed Studies**

A tutorial or directed reading course on selected subjects related to policy analysis.

**PADM 5372 [0.5 credit]****Policy Seminar (Data Science Specialization)**

One or more selected policy areas and topics related to policy and administration in the data science context. Topics will change each year.

**PADM 5391 [0.5 credit]****Directed Studies (Data Science Specialization)**

A tutorial of directed reading on selected subjects related to data science.

**PADM 5411 [0.5 credit]****Organization Theory**

Focusing on major theoretical approaches to organizations, the course develops practical insights into issues such as organizational design, leadership, technology, culture and diversity, motivation and power. It applies these insights to organizations in both the public and private sectors in a variety of national contexts.

**PADM 5415 [0.5 credit]****Strategic Management in the Public Sector**

Key concepts, principles and tools of strategic management, and their use in planning and policy implementation in the public sector. Reviews critical perspectives and cases in order to identify some of the limitations of strategic management.

Includes: Experiential Learning Activity

**PADM 5416 [0.5 credit]****Budgetary Management for the Public Sector**

Theory and practice of budgeting in the public sector. From a management perspective, the course focuses on the objectives, methods and systems for the control and reporting of expenditures.

**PADM 5418 [0.5 credit]****Human Resources Management**

The field of human resources management including the roles of human resource departments, employee motivation, staffing, compensation, benefits, training and development and employee relations.

**PADM 5419 [0.5 credit]****Industrial Relations and Public Sector Collective Bargaining**

The basic concepts of industrial relations, with respect to both public and private sector employees and organizations.

**PADM 5420 [0.5 credit]****Policy and Program Evaluation**

Selected concepts, issues, and processes in applied governmental planning and evaluation, utilizing both Canadian and comparative experiences.

**PADM 5422 [0.5 credit]****Urban and Local Government**

The role of municipal government in the context of Canadian federalism. Current economic, political and social trends affecting Canada's major urban centres including growth, amalgamation, fiscal reform, immigration, housing, community engagement, and sustainable development.

**PADM 5423 [0.5 credit]****Third Sector Governance and Management**

Governance and management of voluntary/nonprofit organizations and their role in democracy, public policy, and service delivery.

**PADM 5441 [0.5 credit]****Introduction to Policy and Program Evaluation**

Survey of evaluation in Canada and internationally. Topics include: Canadian context for public sector evaluation practice; approaches to research in evaluation; essentials of effective evaluation design, including logic modeling, theories of change/action, and contribution/attribution constructs.

**PADM 5442 [0.5 credit]****Quantitative Research Methods in Evaluation**

Descriptive and inferential statistics, probability theory and sampling distributions, hypothesis testing of quantitative and qualitative population parameters, and regression analysis as these apply to the field of program evaluation.

**PADM 5443 [0.5 credit]****Qualitative Research Methods in Evaluation**

Methods used in qualitative evaluation research. Topics include: formulating evaluation research questions; deriving research designs from questions; qualitative data gathering techniques and approaches; managing evidence, ethics reviews, and analysis of qualitative data.

**PADM 5444 [0.5 credit]****Benefit-Cost Analysis for Program Evaluation**

Approaches to benefit-cost analysis in the Canadian evaluation context. Topics include: the role of benefit-cost analysis within program evaluation; its application to public sector investments, pricing and other forms of policy valuation; discount rates, marginal cost, and shadow pricing; risk and uncertainty.

**PADM 5445 [0.5 credit]****Program Evaluation Planning and Designs**

Application of specific evaluation research designs to actual projects. Topics include: designs for formative, summative and developmental programs; designs for policy evaluation; attribution and contribution analysis; applied logic modeling; and managing evaluation projects at the planning stages.

Includes: Experiential Learning Activity

Prerequisite(s): PADM 5441, PADM 5442, PADM 5443, PADM 5444.

**PADM 5446 [0.5 credit]****Program Evaluation Conduct, Analysis and Reporting**

Application of evaluation conduct to actual projects.

Topics include: selecting data analysis methods specific to a project; forming evaluation findings and recommendations; data visualization; reporting techniques; and management of evaluation projects at the conduct stages.

Includes: Experiential Learning Activity

**PADM 5510 [0.5 credit]****Energy Economics**

Micro- and macroeconomic concepts and techniques applied to such topics as international energy markets, energy production, and energy consumption.

**PADM 5511 [0.5 credit]****Energy Management**

The fundamentals of energy management, focusing on current practices in both private and public sector organizations.

**PADM 5512 [0.5 credit]****International Politics of Sustainable Energy**

Recent historical and contemporary developments in the role of energy in inter- and intranational relations, involving such topics as Canada/US relations, the international political economy of oil, energy security, and climate change.

**PADM 5515 [0.5 credit]****Sustainable Energy Policy**

The institutions involved in energy policy, the processes through which policy is made, and the substantive energy-related issues currently preoccupying policy makers. Precludes additional credit for PADM 5615.

**PADM 5572 [0.5 credit]****Policy Seminar (Sustainable Energy)**

One or more selected topics or specialized aspects of sustainable energy policy. The topic will change each year.

**PADM 5611 [0.5 credit]****Science and Technology Policies**

Theory and practice regarding governmental policies for science and technology, and the use of scientific knowledge in the policy and regulatory processes of government. Concerns regarding the ethical issues and the transparency of science in government. Also offered at the undergraduate level, with different requirements, as PADM 4611, for which additional credit is precluded.

**PADM 5612 [0.5 credit]****Industrial Policy, Innovation and Sustainable Production**

Sustainable production theory and key drivers, barriers and opportunities influencing innovation in industrial systems and processes. The relationship of public policies and industry practices are explored in a number of sectors.

Also offered at the undergraduate level, with different requirements, as PADM 4612, for which additional credit is precluded.

**PADM 5614 [0.5 credit]****Natural Resource Management**

Governance and management of natural resources from a Canadian and international perspective. The use of various management instruments, regulatory approaches and community-based and co-management institutions are evaluated with evidence from several case studies from around the world.

**PADM 5615 [0.5 credit]****Politics and Policy of Energy in Canada**

Dilemmas associated with energy policy in Canada. Economic, social and environmental dimensions of energy decision making; Canadian issues within the context of a changing international scene and long term energy transitions.

Precludes additional credit for PADM 5515.

Also offered at the undergraduate level, with different requirements, as PADM 4615, for which additional credit is precluded.

**PADM 5616 [0.5 credit]****Environmental Policy**

Canadian environmental policies and programs set in a comparative political-economic and institutional context. Also offered at the undergraduate level, with different requirements, as PADM 4616, for which additional credit is precluded.

**PADM 5618 [0.5 credit]****Environmental and Ecological Economics**

Environmental and ecological economics with applications to public policy and environmental management issues. Concepts of sustainability, non-market valuation and ecological stability, the determination of environmental targets, and the use of policy instruments, incentives and emissions markets.

Prerequisite(s): PADM 5127 or equivalent.

**PADM 5619 [0.5 credit]****Urban Sustainability**

Impact of economic growth and social change on cities and their attempts to forge sustainable growth. Incorporating political and fiscal issues, the focus is on 'smart growth' policies and initiatives in areas such as environmental control, transport, land use, housing and infrastructure.

**PADM 5620 [0.5 credit]****The Science, Politics and Economics of Global Climate Change**

Scientific issues at the core of climate change and the domestic and international policy responses. Various environmental, economic, and political implications for both the developed and developing worlds and for the various regions of Canada.

**PADM 5702 [0.5 credit]****Policy Seminars****PADM 5703 [0.5 credit]****Directed Studies (Indigenous Public Administration)**

A tutorial or directed reading course on selected subjects.

**PADM 5711 [0.5 credit]****Indigenous-Canada Relations: Governance and Policy History**

Introduction to pre-contact history of select Indigenous nations and peoples, overview of contact period: the treaty relationship, evolving jurisprudence, changing power dynamics, federal and provincial administrative practices, contemporary and traditional forms of First Nations, Métis and Inuit governance. Contrasting approaches to understanding foundational events.

Includes: Experiential Learning Activity

Precludes additional credit for PADM 5224.

**PADM 5712 [0.5 credit]****Issues in Contemporary Governance: First Nations, Métis and Inuit**

Diverse approaches to understanding and responding to the main governance issues facing contemporary and traditional First Nations, Inuit and Métis governments and organizations in Ontario and in the rest of Canada.

**PADM 5713 [0.5 credit]****Public Administration in Indigenous Organizations and Governments**

Principles and processes of public administration relevant to Indigenous contexts and governments. Topics may include comparative government, federalism, Canadian constitutionalism, citizenship, leadership, and select topics in public policy. Includes a practicum.

Includes: Experiential Learning Activity

**PADM 5714 [0.5 credit]****Financial Management in First Nations, Métis and Inuit Governments and Organizations**

Legislation, regulations, and financial management practices that apply in First Nations, Métis, Inuit organizations and governments. Sources and measures to mitigate and eliminate historical disparity, including asset management, strategic investment, and capital aggregation.

**PADM 5715 [0.5 credit]****Policy Research and Evaluation for Indigenous Policy and Administration**

Policy research and program evaluation; applied research ethics, cultural and community protocols, legal frameworks, formulation of research problems, research design, and techniques for collecting and managing community-based and other data; research methodologies of specific Indigenous nations and peoples, and scholarly debates about epistemology and practice. Precludes additional credit for PADM 5125.

**PADM 5716 [0.5 credit]****Economic and Community Development in Indigenous Territories**

Community economic development theories; the ethics, benefits and costs of traditional, current and new approaches pertinent to building stable economies in rural and urban Aboriginal settings. Includes: Experiential Learning Activity

**PADM 5719 [0.5 credit]****Indigenous Health and Social Policy**

Development and delivery of health and social policies pertinent to Indigenous peoples living in diverse circumstances in Canada; theories and practices.

**PADM 5772 [0.5 credit]****Policy Seminar (Indigenous Policy and Administration)**

One or more selected policy areas or specialized aspects of Indigenous Policy and Administration. The policy field or topic will change each year.

**PADM 5814 [0.5 credit]****Program and Project Management**

The context, critical issues and methods relating to the planning and implementation of development programs and projects.

**PADM 5815 [0.5 credit]****Civil Society Organizations and Development**

The context, roles, structures and strategies of nongovernmental organizations in the development process at the global, national and local levels. The role of development aid and NGOs is considered. Also listed as IDMG 5615.

**PADM 5817 [0.5 credit]****Health Policy in Developing Countries**

Debates regarding health policy in the developing world, in the context of the global health sector reform movement, trade and intellectual property regimes, and strategies of corporate and NGO actors. Issues of gender, class and the determinants of health. Also listed as IDMG 5617. Also offered at the undergraduate level, with different requirements, as PADM 4817, for which additional credit is precluded.

**PADM 5908 [1.0 credit]****Research Essay**

Includes: Experiential Learning Activity

**PADM 5909 [2.0 credits]****M.P.P.A. Thesis**

Includes: Experiential Learning Activity

**PADM 5913 [0.0 credit]****Co-operative Work Term**

Includes: Experiential Learning Activity  
Prerequisite(s): registration in the Co-operative Education Option of the M.A. program and permission of the Co-op Supervisor.

**PADM 6010 [0.5 credit]****Current Issues in Public Policy**

Current issues in Canadian public policy, their historical contexts, and interdisciplinary approaches to analyzing them. Issues may include inequality, gender, environment, Indigenous governance, US/Canada relations, populism. Approaches to analysis may include contemporary and classic thinkers. Precludes additional credit for PADM 6114 (no longer offered).

**PADM 6011 [0.5 credit]****Theoretical Foundations of Public Policy**

Normative and explanatory theories fundamental to public policy, drawing on multiple social science disciplines and incorporating ethical, economic, and political/administrative perspectives. Topics may include utilitarianism, rights-based traditions, contractualism, market failure, life-course dynamics.

Precludes additional credit for PADM 6111(no longer offered).

**PADM 6012 [0.5 credit]****Policy Process and Institutions**

Various theoretical approaches to policy-making. Topics may include policy formation, agenda-setting, institutionalism, theories of the bureau, theories of policy change, policy design and implementation, policy evaluation, advocacy and coalitions, private policy-making.

Precludes additional credit for PADM 6112(no longer offered).

**PADM 6013 [0.5 credit]****Research Design for Public Policy**

Introduction to the analytical challenges to the study of public policy, and ways of addressing them. Exploration of why particular explanatory, interpretive and normative research questions are asked; and why particular theories, units of analysis, concepts, methods and data are used. Precludes additional credit for PADM 6113 (no longer offered).

**PADM 6200 [0.5 credit]****Doctoral Research Seminar**

Issues in developing research proposals and conducting public policy research; includes research presentations by senior doctoral students and faculty. Required for second-year doctoral students who present their thesis proposals. Issues surrounding quantitative or qualitative methods in public policy analysis may be discussed. Graded Pass/Fail.

**PADM 6201 [0.5 credit]****Doctoral Research Seminar**

Presentations on research skills and strategies such as ethics approval, bibliographic software, work-flow management, subsequent publication. Supervised independent research projects preliminary to Ph.D. Thesis, drawing upon interdisciplinary approaches to study of public policy. Graded SAT/UNS.

Precludes additional credit for PADM 6200.

Prerequisite(s): PADM 6900.

**PADM 6900 [0.5 credit]****Ph.D. Comprehensive Examination**

Ph.D. preparation for the comprehensive examination. The grade to be awarded will be that obtained on the comprehensive examination.

**PADM 6901 [0.5 credit]****Ph.D. Specialization Tutorial**

A Ph.D. tutorial covering advanced theory and research in an area of specialization generally related to public policy. Specific topics will be selected in consultation with, and must be approved by, the academic supervisor and Ph.D. co-ordinator.

**PADM 6902 [0.5 credit]****Ph.D. Specialization Tutorial**

A Ph.D. tutorial covering advanced theory and research in an area of specialization generally related to public policy. Specific topics will be selected in consultation with, and must be approved by, the academic supervisor and Ph.D. co-ordinator.

**PADM 6909 [0.0 credit]****Ph.D. Thesis**

A thorough investigation of a public policy issue that integrates multiple disciplines into the analysis.

Includes: Experiential Learning Activity

Prerequisite(s): successful public defence of written thesis proposal.

**PADM 6911 [0.0 credit]****Ph.D. Proposal**

Under the direction of thesis (co-)supervisor, development of a research proposal that will guide the Ph.D. thesis research investigation. Concludes with public defence of written thesis proposal.

Prerequisite(s): PADM 6900 and PADM 6201.

## Social Statistics and Data Analysis

This section presents the requirements for programs in:

- **Graduate Diploma in Social Statistics and Data Analysis**

### Graduate Diploma in Social Statistics and Data Analysis (2.0 credits)

Requirements (Type 2 and 3):

<b>1. 0.5 credit in:</b>	<b>0.5</b>
SOCI 5102 [0.5] Multiple Regression Analysis	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
SOCI 5104 [0.5] Advanced Multivariate Analysis	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
SOCI 5809 [0.5] The Logic of the Research Process	
<b>4. 0.5 credit in</b> elective, which must include a research methods component and be offered at Carleton at the graduate or fourth-year undergraduate level and be approved by the SSDA GDip coordinator.	<b>0.5</b>
<b>Total Credits</b>	<b>2.0</b>

### Admission

#### Type 2 Concurrent Program

At the time of admission, applicants to the Type 2 Graduate Diploma in Social Statistics and Data Analysis must be enrolled in a master's or doctoral program at Carleton University.

#### Type 3 Direct-entry Program

Applicants to the Type 3 Graduate Diploma in Social Statistics and Data Analysis must hold a bachelor's degree. Admission for prospective students without a degree will be considered if they have relevant work experience.

## Social Work

This section presents the requirements for programs in:

- **M.S.W. Social Work**
- **Ph.D. Social Work**
- **Ph.D. Social Work with Collaborative Specialization in Political Economy**

### Program Requirements

#### M.S.W. Social Work (11.0 credits)

Students admitted into the Foundation Year (first year of the two year MSW program) must complete the Foundation Year (Year I) and the Advanced Year (Year II) of the MSW program. Students admitted into the Advanced Year must only complete Year II.

Requirements:

#### Foundation Year (Year I) Requirements (6.0 credits):

<b>1. 6.0 credits in:</b>	<b>6.0</b>
SOWK 5000 [0.5] Theoretical Foundations of Social Work: A Critical Perspective	
SOWK 5001 [1.0] Interpersonal Practice in Social Work: Ethics, Knowledge and Skills	
SOWK 5003 [0.5] Policy Context of Social Work	
SOWK 5004 [0.5] Group Work	
SOWK 5606 [2.0] Practicum I	
SOWK 5608 [0.5] Community Practice	
1.0 credit to be taken from graduate-level course offerings in the School	

#### Advanced Year (Year II) Requirements (5.0 credits):

<b>2. 1.0 credit in:</b>	<b>1.0</b>
SOWK 5011 [0.5] Social Work and Social Justice	
SOWK 5012 [0.5] Social Work Research Foundations	
<b>3. 2.0 credits from:</b>	<b>2.0</b>
SOWK 5013 [0.5] Community-Based Participatory Research	
SOWK 5014 [0.5] Social Policy	
SOWK 5015 [0.5] Indigenous Knowledge and Theory for Social Work	
SOWK 5016 [0.5] Social Work Practice with Individuals and Families	
SOWK 5017 [0.5] Advanced Organizational Administration and Practice	
SOWK 5018 [0.5] Advanced Clinical Social Work Practice	
SOWK 5020 [0.5] Social Work in Health Care Settings	
SOWK 5021 [0.5] Advanced Social Work Practice with Groups and Communities	
SOWK 5302 [0.5] Mental Health	
SOWK 5502 [0.5] The Transformation of Social Responsibility in Canada	
SOWK 5700 [0.5] Special Topics in Social Policy	
SOWK 5701 [0.5] Special Topics in Direct Intervention	
SOWK 5702 [0.5] Special Topics in Social Work	
SOWK 5703 [0.5] Special Topics in Social Work	
<b>3. 2.0 credits in:</b>	<b>2.0</b>
<b>a) Thesis pathway:</b>	
SOWK 5909 [2.0] Thesis	

or

**b) Practicum pathway:**

SOWK 5607 [2.0] Practicum II

**Total Credits** **11.0**

For all course options listed above, a minimum of 1.0 credit to be taken from graduate-level Social Work course offerings, or with permission from the School of Social Work, a maximum of 1.0 credit may be taken outside the School of Social Work, and a maximum of 0.5 credit may be taken at the 4000-level.

All students in SOWK 5903, SOWK 5909, SOWK 5606, SOWK 5607 must maintain continuous registration until completion of the course in accordance with the General Regulations as stated in this calendar.

**Part-Time Studies**

The School offers part-time studies to a limited number of qualified candidates. The requirements for part-time studies are identical to those of the regular program, except that part-time students are limited to a maximum of 1.0 credit of course work per term.

Students registered on a part-time basis must maintain continuous registration for a minimum of two terms per year until all course requirements are completed.

In their first fall term, part-time students in the MSW Foundation Year (Year I) must register in SOWK 5000 and one of SOWK 5003 or SOWK 5608. In their second fall term, they must register for SOWK 5001. Part-time students in the MSW Advanced Year (Year II) register in SOWK 5011 and SOWK 5012 in their first fall term.

**Change of Status**

Students contemplating changing their full-time or part-time status should consult the General Regulations section of this Calendar.

**Ph.D. Social Work (5.5 credits)**

**Note:** Admission to the Ph.D. Social Work is currently closed. Please contact the department if you have any questions.

**Requirements:**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
SOWK 6101 [0.5] Theoretical Foundations	
SOWK 6102 [0.5] Ethical Foundations	
<b>2. 1.0 credit in:</b>	<b>1.0</b>
SOWK 6301 [0.25] Ph.D. Seminar	
SOWK 6302 [0.25] Ph.D. Seminar	
SOWK 6303 [0.25] Ph.D. Seminar	
SOWK 6304 [0.25] Ph.D. Seminar	
<b>3. 1.0 credit in:</b>	<b>1.0</b>
SOWK 6201 [0.5] Theory and Methods	
SOWK 6202 [0.5] Research Design	
<b>4. 0.5 credit in:</b>	<b>0.5</b>
SOWK 6401 [0.5] Critical Pedagogy	
<b>5. 1.0 credit in</b> electives, which may include:	<b>1.0</b>
1.0 credit in 5000- or 6000-level SOWK courses,	

or 0.5 credit in SOWK at the 5000- 6000-level and up to 0.5 credit at the 5000- or 6000- level from a discipline other than SOWK (with approval of the School)

the SOWK courses may include:

SOWK 6405 [0.5] Directed Studies

SOWK 6406 [0.5] Directed Studies

**6. 0.5 credit in:** **0.5**

SOWK 6600 [0.5] Practicum in Advocacy Research

or

0.5 credit in an approved research course at an equivalent level in another discipline

**7. 0.5 credit in:** **0.5**

SOWK 6800 [0.5] Qualifying Examination

**8. 0.0 credits in:** **0.0**

SOWK 6909 [0.0] PhD Dissertation

**Total Credits** **5.5**

**Notes:**

1. The School requires that 5.0 credits in course work plus the 0.5 credit in the Qualifying exam be completed by the end of the first six semesters (i.e. fall, winter, spring/summer).
2. During the third year of study, students are required to develop and defend their research proposal.

**Ph.D. Social Work  
with Collaborative Specialization in Political  
Economy (5.5 credits)**

**Note:** Admission to the Ph.D. Social Work with Collaborative Specialization in Political Economy is currently closed. Please contact the department if you have any questions.

**Requirements:**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
SOWK 6101 [0.5] Theoretical Foundations	
SOWK 6102 [0.5] Ethical Foundations	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
PECO 6000 [0.5] Political Economy: Core Concepts	
<b>3. 0.5 credit in</b> a relevant political economy course from the approved list	<b>0.5</b>
<b>4. 1.0 credit in:</b>	<b>1.0</b>
SOWK 6201 [0.5] Theory and Methods	
SOWK 6202 [0.5] Research Design	
<b>5. 0.5 credit in:</b>	<b>0.5</b>
SOWK 6401 [0.5] Critical Pedagogy	
<b>6. 1.0 credit in:</b>	<b>1.0</b>
SOWK 6301 [0.25] Ph.D. Seminar	
SOWK 6302 [0.25] Ph.D. Seminar	
SOWK 6303 [0.25] Ph.D. Seminar	
SOWK 6304 [0.25] Ph.D. Seminar	
<b>7. 0.5 credit in:</b>	<b>0.5</b>
SOWK 6600 [0.5] Practicum in Advocacy Research	
or	
0.5 credit in an approved research course at an equivalent level in another discipline	
<b>8. 0.5 credit in:</b>	<b>0.5</b>
SOWK 6800 [0.5] Qualifying Examination	
<b>9. 0.0 credits in:</b>	<b>0.0</b>

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**Total Credits**

**5.5**

**Regulations**

See the General Regulations section of this Calendar.

Candidates for the MSW degree must complete all course work (or the equivalent) counted towards the degree with a grade of B- or higher. The School of Social Work does not permit the C+ option.

**Regulations**

See the General Regulations section of this Calendar

Candidates must obtain a grade of B- or higher in each course and Satisfactory on the Ph.D. thesis and its oral defence.

**Part-Time Studies**

Students not able to remain in full-time studies may only apply for part-time status following the completion of their second year of studies and with evidence of satisfactory progress in their research.

**Change of Status**

Students contemplating changing their full-time or part-time status should consult the General Regulations section of this Calendar.

**Admission**

The School of Social Work provides two points of entry into the Master of Social Work program.

Applications are accepted to the Foundation Year (first year of a two year MSW program) from candidates who hold an Honours bachelor's degree, or the equivalent, with at least high honours standing (normally B+ or higher in the final two years/10 full credits of university courses; B- or higher overall) in a discipline other than social work.

Application are accepted to the Advanced Year (one year MSW program) from candidates who hold an accredited Bachelor of Social Work degree with honours standing (normally B+ or higher in the final two years/10 full credits of university courses; B- or higher overall).

Applications are accepted from candidates who are in the process of completing their final year of study, and who have maintained B+ or higher.

Work experience in social work or a related field is considered as one of several selection criteria for application to both Foundation Year and Advanced Year.

Applicants must have completed (or be in the process of completing) 0.5 credit in research methods or 0.5 credit in statistics with a minimum B grade or higher in either course.

The School of Social Work will not grant advanced standing for course work completed prior to entry into the MSW program.

Students accepted into Foundation Year will be expected to complete 6.0 credits of course work in year I and 5.0 credits of course work in year II.

**Admission**

**Note:** Admission to the Ph.D. Social Work is currently closed. Please contact the department if you have any questions.

There are three principal criteria for admission.

- Completion of an MSW at an accredited program in Social Work (Canadian Association for Social Work Education or equivalent), or a similarly accredited BSW and a closely related graduate degree. An average of A- or better at the Masters level is normally required.
- Demonstrated ability to conduct independent research and to complete the program. Applications must contain one academic or professional paper completed by the applicant at the graduate level or its equivalent.
- A minimum of two years full-time post graduate work experience, or five years post-baccalaureate work experience in the social services and/or social policy field.

**Note:** The School may require a candidate to complete an additional course (such as research methods or theory) to qualify for admission. Such a candidate may be provisionally admitted into the program and permitted to take the additional course concurrently with the regular PhD courses.

**Social Work (SOWK) Courses**

**SOWK 5000 [0.5 credit]**

**Theoretical Foundations of Social Work: A Critical Perspective**

History of social work and progressive social work. Introduction to critical theories and approaches informing contemporary social work in Canada: structural, anti-racist, Indigenous, anti-oppressive, queer, critical disability, post-structural, and political economy.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in MSW Foundation Year.

**SOWK 5001 [1.0 credit]**

**Interpersonal Practice in Social Work: Ethics, Knowledge and Skills**

Theoretical exploration of the values, ethics, and historical development of direct social work knowledge and skills for practice. Focus on student skills development for beginning practice, including building therapeutic alliance, differential use of interviewing skills, contracting, biopsychosocial assessment, goal setting, and treatment planning.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in MSW Foundation Year.

**SOWK 5003 [0.5 credit]****Policy Context of Social Work**

Historical context, theories and approaches to social policy analysis, development, and practice in Social Work. Examination of federal, provincial, municipal and organizational policies. Focus on processes for policy development, consultation, collaboration, political struggle, and challenges of bridging policy with individual services.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in MSW Foundation Year.

**SOWK 5004 [0.5 credit]****Group Work**

History, theories, and models of social work practice with groups. A range of group practice approaches, including task-focused, mutual aid, psychoeducational, and process-oriented therapeutic groups.

Includes: Experiential Learning Activity

Prerequisite(s): SOWK 5000 and SOWK 5001.

**SOWK 5011 [0.5 credit]****Social Work and Social Justice**

Relationships between social work professionals and social justice movements. Indigenous, anti-racist, queer, disability, trans, class, and feminist knowledge, politics, and activism informing social work practice in Canada.

Includes: Experiential Learning Activity

Prerequisite(s): BSW or Foundation Year of MSW program.

**SOWK 5012 [0.5 credit]****Social Work Research Foundations**

Foundations of social work research with a focus on understanding evidence-based practice. Students will learn how to understand research to inform social work practice, and how to use research in social work practice.

Prerequisite(s): BSW or Foundation Year of MSW program.

**SOWK 5013 [0.5 credit]****Community-Based Participatory Research**

Using community-based participatory research approaches, students will assist community organizations using qualitative and/or quantitative techniques to address research questions with a social justice focus. Emphasizes an understanding of different research paradigms, ethics, and the importance of self-reflection and integration.

Includes: Experiential Learning Activity

Prerequisite(s): BSW or Foundation Year of MSW program.

**SOWK 5014 [0.5 credit]****Social Policy**

Advanced study of social work contributions and strategies for policy development and analysis. Focus on policy change and negotiation within the contemporary context and the impact on clients' lives and social work practice. Attention to alternative policy processes, e.g., Indigenous, and social justice practice.

Includes: Experiential Learning Activity

Prerequisite(s): BSW or Foundation Year of the MSW program.

**SOWK 5015 [0.5 credit]****Indigenous Knowledge and Theory for Social Work**

Exploration of Indigenous knowledge and Indigenous approaches to social work. Understanding history of social work with Indigenous peoples in Canada and strategies for reconciliation.

Includes: Experiential Learning Activity

Prerequisite(s): BSW or Foundation Year of the MSW program.

**SOWK 5016 [0.5 credit]****Social Work Practice with Individuals and Families**

Biopsychosocial theories and practice models (i.e., psychodynamic, cognitive-behavioural, narrative) for working with individuals and families in a contemporary practice environment. A critical approach to theories and models.

Includes: Experiential Learning Activity

Prerequisite(s): BSW or Foundation Year of the MSW program.

**SOWK 5017 [0.5 credit]****Advanced Organizational Administration and Practice**

Theories of organizational behaviour, approaches to management, skills for developing funding proposals, program development, managing budgets, program evaluation and creating organizational change.

Includes: Experiential Learning Activity

Prerequisite(s): BSW or Foundation Year of the MSW program.

**SOWK 5018 [0.5 credit]****Advanced Clinical Social Work Practice**

Clinical concepts for relationship-based, theoretically and empirically grounded, social justice-seeking practice, e.g., reflexive use of self, transference/countertransference, and navigating power. Focus on development of one's individualized clinical practice framework.

Includes: Experiential Learning Activity

Prerequisite(s): BSW or Foundation Year of the MSW program.

**SOWK 5020 [0.5 credit]****Social Work in Health Care Settings**

Social work practice in a range of health-care settings with a focus on health-care policy practice and direct intervention in various areas of health care.

Prerequisite(s): BSW or Foundation Year of the MSW program.

**SOWK 5021 [0.5 credit]****Advanced Social Work Practice with Groups and Communities**

Focus on practice with groups and communities, particularly implementing approaches reviewed in undergraduate programs and/or Foundation Year, dealing with tensions in practice, critical reflection, advanced practice techniques and evaluation.

Includes: Experiential Learning Activity

Prerequisite(s): BSW or Foundation Year of the MSW program.

**SOWK 5302 [0.5 credit]****Mental Health**

Historical development, legislative framework, institutional and service structure, and practice issues related to mental health services in Canada. The interface between mental health and sexual abuse, family violence, racism, corrections, aging and immigration.

Includes: Experiential Learning Activity

**SOWK 5502 [0.5 credit]****The Transformation of Social Responsibility in Canada**

Development of social welfare in Canada from the 19th century to the present. Federal and provincial state formation and colonialism, imperialism, class, and racism. Transformations in the politics of struggle for social and economic justice.

Prerequisite(s): Permission of the School of Social Work.

**SOWK 5506 [0.5 credit]****Directed Studies**

Individual exploration of selected theoretical perspectives for social work practice under the direct supervision of a member of faculty or visiting scholar.

Includes: Experiential Learning Activity

**SOWK 5606 [2.0 credits]****Practicum I**

Integration of academic and practical aspects of social work education. 450 hours of guided learning in a community-based setting in the winter term. Includes compulsory practicum seminars. Graded SAT/UNS.

Includes: Experiential Learning Activity

Prerequisite(s): registration in MSW Foundation Year (Year I); completion of SOWK 5000, SOWK 5001, SOWK 5003, and SOWK 5608; and completion of or concurrent registration in SOWK 5004.

**SOWK 5607 [2.0 credits]****Practicum II**

Integration of advanced social work theories and practice in clinical, policy, research or other settings. 450 hours of guided learning in a practicum setting in the summer term.

Includes compulsory practicum seminars. Graded SAT/UNS.

Includes: Experiential Learning Activity

Prerequisite(s): BSW or completion of MSW Foundation Year (Year I); completion of SOWK 5011, SOWK 5012.

**SOWK 5608 [0.5 credit]****Community Practice**

Exploration of history, theory and practice of community work in social work. Engagement, assessment, and interventions with communities will be explored using a variety of community-based approaches including: Indigenous community change, and critical approaches to community work.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in MSW Foundation Year.

**SOWK 5700 [0.5 credit]****Special Topics in Social Policy**

The School will offer courses on substantive topics related to social administration and policy. Topics vary depending on the interests of faculty and students and the availability of instructors. Students outside of the School may register with permission from the School.

**SOWK 5701 [0.5 credit]****Special Topics in Direct Intervention**

The School will offer courses on substantive topics related to direct intervention including community development. Topics vary depending on the interests of faculty and students and the availability of instructors. Students outside of the School may register with permission from the School.

Includes: Experiential Learning Activity

**SOWK 5702 [0.5 credit]****Special Topics in Social Work**

The School will offer lecture courses on substantive topics related to social work and social welfare. Topics will vary each year depending on the interests of faculty and students. Students from outside the School of Social Work may register with permission of the School.

**SOWK 5703 [0.5 credit]****Special Topics in Social Work**

The School will offer lecture courses on substantive topics related to social work and social welfare. Topics will vary each year depending on the interests of faculty and students. Students from outside the School of Social Work may register with permission of the School.

**SOWK 5903 [1.0 credit]****Independent Research Studies in Social Work**

Individually-arranged independent research study. Requires a written proposal that outlines a research project with clear learning objectives, and practice objectives (where relevant).

Includes: Experiential Learning Activity

**SOWK 5904 [0.5 credit]****Independent Research Studies in Social Work**

Individually-arranged independent research study. Requires a written proposal that outlines a research project with clear learning objectives, and practice objectives (where relevant).

Includes: Experiential Learning Activity

**SOWK 5909 [2.0 credits]****Thesis**

Includes: Experiential Learning Activity

Prerequisite(s): registration in MSW Advanced Year (Year II).

**SOWK 6101 [0.5 credit]****Theoretical Foundations**

A focus on human rights and social justice that explores the dynamic tensions of life in an advanced capitalist, globalized political economy and the relevance for social work practices. This course will assist students in developing the theoretical frameworks for their dissertations.

Precludes additional credit for SOWK 6100 (no longer offered).

**SOWK 6102 [0.5 credit]****Ethical Foundations**

This seminar examines notions of the subject and subjectivity, and the attendant concept of the other in the context of ethics in social work practice. What is the ethics of our social doing? What are we advancing and for whom?.

Precludes additional credit for SOWK 6100 (no longer offered).

**SOWK 6201 [0.5 credit]****Theory and Methods**

Theories and methods from the social sciences and humanities as applied in social work research. Emphasis on theories and methods most consistent with structural approaches. Through engagement with the research literature, students acquire skills in assessing and comparing research approaches.

Includes: Experiential Learning Activity

**SOWK 6202 [0.5 credit]****Research Design**

Building on SOWK 6201, this course supports students in learning how to design a critically-oriented research project, including how to ensure methodological coherence, ethics, rigour, timeliness and relevance to the field of structurally-informed social work.

Includes: Experiential Learning Activity

**SOWK 6301 [0.25 credit]****Ph.D. Seminar**

Students engage in scholarly discussion with the goal of developing mutual, collegial support and skills in critical scholarship. Students will present, discuss and critique their own papers and research; and discuss presentations by social work faculty and other university scholars.

Includes: Experiential Learning Activity

**SOWK 6302 [0.25 credit]****Ph.D. Seminar**

Students engage in scholarly discussion with the goal of developing mutual, collegial support and skills in critical scholarship. Students will present, discuss and critique their own papers and research; and discuss presentations by social work faculty and other university scholars.

Includes: Experiential Learning Activity

**SOWK 6303 [0.25 credit]****Ph.D. Seminar**

Students engage in scholarly discussion with the goal of developing mutual, collegial support and skills in critical scholarship. Students will present, discuss and critique their own papers and research; and discuss presentations by social work faculty and other university scholars.

Includes: Experiential Learning Activity

**SOWK 6304 [0.25 credit]****Ph.D. Seminar**

Students engage in scholarly discussion with the goal of developing mutual, collegial support and skills in critical scholarship. Students will present, discuss and critique their own papers and research; and discuss presentations by social work faculty and other university scholars.

Includes: Experiential Learning Activity

**SOWK 6401 [0.5 credit]****Critical Pedagogy**

Application of educational theory, models, practices, design and technology for post-secondary education.

Theory and practice of critical pedagogy, curriculum development, teaching methods, skills and strategies.

Includes: Experiential Learning Activity

**SOWK 6405 [0.5 credit]****Directed Studies**

Individually-arranged independent exploration of selected areas of inquiry that are offered subject to the availability of faculty. Requires a written proposal with clear learning objectives and study plan.

**SOWK 6406 [0.5 credit]****Directed Studies**

Individually-arranged independent exploration of selected areas of inquiry that are offered subject to the availability of faculty. Requires a written proposal with clear learning objectives and study plan.

**SOWK 6600 [0.5 credit]****Practicum in Advocacy Research**

Student will engage in projects that integrate research and community while contributing to change. Graded Sat/Uns.

Includes: Experiential Learning Activity

**SOWK 6800 [0.5 credit]****Qualifying Examination**

A critical assessment and demonstration of mastery in an area of inquiry related to the research project, involving theoretical, methodological and substantive components. Requires a proposal to the Exam Committee, the successful completion of a Qualifying Exam paper and an Oral Qualifying Exam.

**SOWK 6909 [0.0 credit]****PhD Dissertation**

An original scholarly research contribution constituting a significant contribution to the field of social welfare and the profession of social work. Dissertation must meet standards including a formal oral defense governed by the regulations of the Faculty of Graduate Studies and Postdoctoral Affairs.

Includes: Experiential Learning Activity

# Sociology

This section presents the requirements for programs in:

- **M.A. Sociology**
- **M.A. Sociology with Concentration in Quantitative Methodology**
- **M.A. Sociology with Collaborative Specialization in Accessibility**
- **M.A. Sociology with Collaborative Specialization in African Studies**
- **M.A. Sociology with Collaborative Specialization in Climate Change**
- **M.A. Sociology with Collaborative Specialization in Data Science**
- **M.A. Sociology with Collaborative Specialization in Digital Humanities**
- **M.A. Sociology with Collaborative Specialization in Latin American and Caribbean Studies**
- **Ph.D. Sociology**
- **Ph.D. Sociology with Collaborative Specialization in African Studies**
- **Ph.D. Sociology with Collaborative Specialization in Political Economy**
- **Graduate Diploma in Social Statistics and Data Analysis**

## Program Requirements

### Transfer from Thesis to Course Work M.A.

Students who choose to change from the thesis to the course work program must normally do so before registering for a third term after initial, full-time registration, or before registering for a fifth term after initial part-time registration.

### M.A. Sociology (5.0 credits)

#### Requirements - thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>2. 2.0 credits in courses.</b> With department permission 0.5 credit may be selected from courses at the 4000-level.	2.0
<b>3. 2.0 credits in:</b>	2.0
SOCI 5909 [2.0]	M.A. Thesis
<b>4. An oral examination on the candidate's thesis and program</b>	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - research essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>2. 3.0 credits in courses.</b> With department permission 0.5 credit may be selected from courses at the 4000-level.	3.0
<b>3. 1.0 credit in:</b>	1.0
SOCI 5908 [1.0]	M.A. Research Essay

<b>4. An oral examination on the candidate's research essay and program</b>	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - course work pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>2. 4.0 credits in courses.</b> With department permission 0.5 credit may be selected from courses at the 4000-level.	4.0
<b>Total Credits</b>	<b>5.0</b>

### M.A. Sociology with Concentration in Quantitative Methodology (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>2. 1.0 credit from:</b>	1.0
SOCI 5102 [0.5]	Multiple Regression Analysis
SOCI 5104 [0.5]	Advanced Multivariate Analysis
<b>3. 1.0 credit in SOCI at the graduate level (not including those listed above)</b>	1.0
With department permission 0.5 credit may be selected from courses at the 4000-level.	
<b>4. 2.0 credits in a thesis</b>	2.0
<b>5. An oral examination on the candidate's thesis and program</b>	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research Essay pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>2. 1.0 credit from:</b>	1.0
SOCI 5102 [0.5]	Multiple Regression Analysis
SOCI 5104 [0.5]	Advanced Multivariate Analysis
<b>3. 2.0 credits in SOCI at the graduate level (not including those listed above)</b>	2.0
With department permission 0.5 credit may be selected from courses at the 4000-level.	
<b>4. 1.0 credit in a research essay</b>	1.0
<b>5. An oral examination on the candidate's research essay and program</b>	0.0
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Coursework pathway (5.0 credits)

<b>1. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>2. 1.0 credit from:</b>	1.0
SOCI 5102 [0.5]	Multiple Regression Analysis
SOCI 5104 [0.5]	Advanced Multivariate Analysis
<b>3. 3.0 credit in SOCI at the graduate level (not including those listed above)</b>	3.0

With department permission 0.5 credit may be selected from courses at the 4000-level.

<b>Total Credits</b>	<b>5.0</b>
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Students in the Concentration in Quantitative Methodology may arrange a work placement as 0.5 credit toward the program requirements as an approved option course. Consult with the department of Sociology and Anthropology for further details.

Students in the Concentration in Quantitative Methodology may apply for admission into a Cooperative Education option. See the Co-operative Education tab on this page for further details.

### M.A. Sociology with Collaborative Specialization in Accessibility (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

- |  |     |
|--|-----|
| 1. <b>1.0 credit in:</b>   | 1.0 |
| SOCI 5005 [0.5]    Recurring Debates in Social Thought   |     |
| SOCI 5809 [0.5]    The Logic of the Research Process   |     |
| 2. <b>1.0 credit in:</b>   | 1.0 |
| ACCS 5001 [0.5]    Critical Disability Studies   |     |
| ACCS 5002 [0.5]    Accessibility and Inclusive Design Seminar  |     |
| 3. <b>1.0 credit in</b> SOCI at the graduate level (not including those listed above). With departmental permission 0.5 credit may be selected from courses at the 4000-level. | 1.0 |
| 4. <b>2.0 credits in:</b>  | 2.0 |
| SOCI 5909 [2.0]    M.A. Thesis (in the specialization)   |     |
| 5. An oral examination on the candidate's thesis and program   |     |

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Research essay pathway (5.0 credits):

- |   |     |
|---|-----|
| 1. <b>1.0 credit in:</b>  | 1.0 |
| SOCI 5005 [0.5]    Recurring Debates in Social Thought  |     |
| SOCI 5809 [0.5]    The Logic of the Research Process  |     |
| 2. <b>1.0 credit in:</b>  | 1.0 |
| ACCS 5001 [0.5]    Critical Disability Studies  |     |
| ACCS 5002 [0.5]    Accessibility and Inclusive Design Seminar   |     |
| 3. <b>2.0 credits in</b> SOCI at the graduate level (not including those listed above). With departmental permission 0.5 credit may be selected from courses at the 4000-level. | 2.0 |
| 4. <b>1.0 credit in:</b>  | 1.0 |
| SOCI 5908 [1.0]    M.A. Research Essay (in the specialization)  |     |
| 5. An oral examination on the candidate's thesis and program  |     |

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Coursework pathway (5.0 credits):

- |  |     |
|--|-----|
| 1. <b>1.0 credit in:</b>                               | 1.0 |
| SOCI 5005 [0.5]    Recurring Debates in Social Thought |     |
| SOCI 5809 [0.5]    The Logic of the Research Process   |     |
| 2. <b>1.0 credit in:</b>                               | 1.0 |
| ACCS 5001 [0.5]    Critical Disability Studies         |     |

ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar	
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3. <b>0.5 credit in</b> a course designated as having sufficient accessibility content and approved by the Sociology graduate coordinator	0.5
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4. <b>2.5 credits in</b> SOCI at the graduate level (not including those listed above). With departmental permission 0.5 credit may be selected from courses at the 4000-level.	2.5
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<b>Total Credits</b>	<b>5.0</b>
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### M.A. Sociology with Collaborative Specialization in African Studies (5.0 credits)

#### Requirements - Thesis pathway (5.0 credits):

- |   |     |
|---|-----|
| 1. <b>1.0 credit in:</b>  | 1.0 |
| SOCI 5005 [0.5]    Recurring Debates in Social Thought  |     |
| SOCI 5809 [0.5]    The Logic of the Research Process  |     |
| 2. <b>1.5 credits in</b> courses. With departmental permission 0.5 credit may be selected from courses at the 4000-level. | 1.5 |
| 3. <b>2.0 credits in:</b>   | 2.0 |
| SOCI 5909 [2.0]    M.A. Thesis  |     |
| 4. <b>0.5 credit in:</b>  | 0.5 |
| AFRI 5000 [0.5]    African Studies as a Discipline: Historical and Current Perspectives                                   |     |
| 5. <b>0.0 credit in:</b>  |     |
| AFRI 5800 [0.0]    Scholarly Preparation in African Studies (5. 0.0 credit in:)   |     |

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Research Essay pathway (5.0 credits)

- |   |     |
|---|-----|
| 1. <b>1.0 credit in:</b>  | 1.0 |
| SOCI 5005 [0.5]    Recurring Debates in Social Thought  |     |
| SOCI 5809 [0.5]    The Logic of the Research Process  |     |
| 2. <b>2.5 credits in</b> courses. With departmental permission 0.5 credit may be selected from courses at the 4000-level. | 2.5 |
| 3. <b>1.0 credit in:</b>  | 1.0 |
| SOCI 5908 [1.0]    M.A. Research Essay  |     |
| 4. <b>0.5 credit in:</b>  | 0.5 |
| AFRI 5000 [0.5]    African Studies as a Discipline: Historical and Current Perspectives                                   |     |
| 5. <b>0.0 credit in:</b>  | 0.0 |
| AFRI 5800 [0.0]    Scholarly Preparation in African Studies   |     |
| 6. An oral examination on the candidate's research essay and program.   |     |

<b>Total Credits</b>	<b>5.0</b>
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#### Requirements - Coursework pathway (5.0 credits)

- |   |     |
|---|-----|
| 1. <b>1.0 credit in:</b>  | 1.0 |
| SOCI 5005 [0.5]    Recurring Debates in Social Thought  |     |
| SOCI 5809 [0.5]    The Logic of the Research Process  |     |
| 2. <b>2.5 credits in</b> courses excluding SOCI 5905. With departmental permission 0.5 credit may be selected from courses at the 4000-level. | 2.5 |
| 3. <b>1.0 credit in</b> courses designated as having sufficient African Studies content, including at least 0.5 credit in:                    | 1.0 |
| SOCI 5404 [0.5]    Race, Ethnicity and Class in Contemporary Societies  |     |

ANTH 5109 [0.5]	Ethnography of Gender	
ANTH 5209 [0.5]	Special Topics in Ethnography of Contemporary Africa	
ANTH 5809 [0.5]	Special Topics in the Anthropology of Development	
Or, a Sociology or Anthropology course approved by the Graduate Coordinator of the Institute of African Studies.		
<b>4. 0.5 credit in:</b>		0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>5. 0.0 credit in:</b>		
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Sociology with Collaborative Specialization in Climate Change (5.0 credits)**

#### **Requirements - Thesis pathway:**

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>4. 1.0 credit in</b>	approved electives, chosen in consultation with the student's advisor	1.0
<b>5. 2.0 credits in:</b>		2.0
SOCI 5909 [2.0]	M.A. Thesis (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements - Research essay pathway:**

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>4. 2.0 credit in</b>	approved electives, chosen in consultation with the student's advisor	2.0
<b>5. 1.0 credit in:</b>		1.0
SOCI 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Sociology with Collaborative Specialization in Data Science (5.0 credits)**

#### **Requirements - Thesis pathway (5.0 credits):**

<b>1. 0.5 credit in:</b>		0.5
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	

<b>3. 1.0 credit in:</b>		1.0
SOCI 5102 [0.5]	Multiple Regression Analysis	
SOCI 5104 [0.5]	Advanced Multivariate Analysis	
<b>4. 0.5 credit in</b>	SOCI at the graduate level (not including those listed above). May be selected from courses at the 4000-level, with department permission.	0.5
<b>5. 2.0 credits in:</b>		2.0
SOCI 5909 [2.0]	M.A. Thesis (in the specialization)	
6.0 An oral examination on the candidate's thesis and program		
<b>Total Credits</b>		<b>5.0</b>

#### **Requirements – Research Essay pathway (5.0 credits):**

<b>1. 0.5 credit in:</b>		0.5
DATA 5000 [0.5]	Introduction to Data Science	
<b>2. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>3. 1.0 credit in:</b>		1.0
SOCI 5102 [0.5]	Multiple Regression Analysis	
SOCI 5104 [0.5]	Advanced Multivariate Analysis	
<b>4. 1.5 credits in</b>	SOCI at the graduate level (not including those listed above). With department permission 0.5 credit may be selected from courses at the 4000-level.	1.5
<b>5. 1.0 credit in:</b>		1.0
SOCI 5908 [1.0]	M.A. Research Essay (in the specialization)	
6. An oral examination on the candidate's research essay and program		
<b>Total Credits</b>		<b>5.0</b>

### **M.A. Sociology with Collaborative Specialization in Digital Humanities (5.0 credits)**

#### **Requirements - Research essay pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>		1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought	
SOCI 5809 [0.5]	The Logic of the Research Process	
<b>2. 2.0 credits in</b>	courses. With departmental permission one of the courses may be 0.5 credit at the 4000-level.	2.0
3. An oral examination on the candidate's research essay and program		
<b>4. 1.0 credit in:</b>		1.0
SOCI 5908 [1.0]	M.A. Research Essay (in the specialization)	
<b>5. 0.5 credit in:</b>		0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities	
<b>6. 0.5 credit from:</b>		0.5
DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities	
DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities	
Or, annually listed DIGH course.		
<b>7. 0.0 credit in:</b>		0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development	
<b>Total Credits</b>		<b>5.0</b>

**Requirements - Thesis pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>2. 1.0 credit in courses</b>	1.0
<b>3. 2.0 credits in:</b>	2.0
SOCI 5909 [2.0]	M.A. Thesis (in the specialization)
4. An oral examination on the candidate's thesis and program	
<b>5. 0.5 credit in:</b>	0.5
DIGH 5000 [0.5]	Issues in the Digital Humanities
<b>6. 0.5 credit from:</b>	0.5
DIGH 5011 [0.5]	Graduate Practicum in Digital Humanities
DIGH 5012 [0.5]	Directed Readings and Research in Digital Humanities
Or, annual listed DIGH course	
<b>7. 0.0 credit in:</b>	0.0
DIGH 5800 [0.0]	Digital Humanities: Professional Development
<b>Total Credits</b>	<b>5.0</b>

**M.A. Sociology  
with Collaborative Specialization in Latin  
American and Caribbean Studies (5.0 credits)**
**Requirements - Thesis pathway:**

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>4. 1.5 credits in electives</b>	1.5
<b>5. 2.0 credits in:</b>	2.0
SOCI 5909 [2.0]	M.A. Thesis (on an approved topic with significant content related to Latin American and Caribbean Studies)
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Research Essay pathway:**

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>4. 2.5 credits in electives</b>	2.5
<b>5. 1.0 credit in:</b>	1.0

SOCI 5908 [1.0]	M.A. Research Essay (on an approved topic with significant content related to Latin American and Caribbean Studies)
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<b>Total Credits</b>	<b>5.0</b>
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**Requirements - Coursework pathway:**

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 1.0 credit in:</b>	1.0
SOCI 5005 [0.5]	Recurring Debates in Social Thought
SOCI 5809 [0.5]	The Logic of the Research Process
<b>4. 0.5 credit from:</b>	0.5
ANTH 5109 [0.5]	Ethnography of Gender
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies
SOCI 5409 [0.5]	The Politics of Social Movements and the State
<b>5. 3.0 credits in electives, including 0.5 credit in course(s) designated as having sufficient Latin American and Caribbean Studies content, approved by both the Graduate Supervisor and the Coordinator of Latin American and Caribbean Studies</b>	3.0
<b>Total Credits</b>	<b>5.0</b>

**Ph.D. Sociology (3.0 credits)****Requirements:**

<b>1. 0.0 credit in:</b>	0.0
SOCI 6101 [0.0]	Introductory Doctoral Seminar
<b>2. 1.0 credits in:</b>	1.0
SOCI 6102 [0.5]	Doctoral Seminar Year 1: Comprehensive Exam
SOCI 6103 [0.5]	Doctoral Seminar Year 2: Research Design
<b>3. 0.5 credit in:</b>	0.5
SOCI 5008 [0.5]	Teaching Sociology
Or one of the following:	
SOCI 5000 [0.5]	Classical Sociological Theory
SOCI 5001 [0.5]	Special Topics in Classical Theory
SOCI 5002 [0.5]	Contemporary Sociological Theory
SOCI 5003 [0.5]	Special Topics in Contemporary Theory
SOCI 5006 [0.5]	Thinking Sociologically
SOCI 5308 [0.5]	Decolonizing Feminist Analyses
SOCI 5309 [0.5]	Cultural Theory
SOCI 5400 [0.5]	Political Sociology
SOCI 5401 [0.5]	Critical Disability Studies
SOCI 5402 [0.5]	Queer Migrations
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies
SOCI 5405 [0.5]	Power and Stratification
SOCI 5407 [0.5]	Genealogies of Politics and Governance
SOCI 5408 [0.5]	Feminism and Materialism

SOCI 5501 [0.5]	Phenomenology for Anthropologists and Sociologists	
SOCI 5803 [0.5]	Critical Theory	
SOCI 5804 [0.5]	Modern Marxist Theory	
<b>4. 1.5 credits in</b>	SOCI courses at the 5000- or 6000-level or, with the permission of the graduate supervisor, up to 1.0 credit of graduate level courses from another unit at Carleton	<b>1.5</b>
<b>5.</b>	Written and oral comprehensive examination in one area of specialization	
<b>6.</b>	Presentation of a thesis proposal	
<b>7. 0.0 credit in:</b>		<b>0.0</b>
SOCI 6909 [0.0]	Ph.D. Thesis	
<b>8.</b>	An oral defence of the thesis	
<b>Total Credits</b>		<b>3.0</b>

### Ph.D. Sociology with Collaborative Specialization in African Studies (3.0 credits)

#### Requirements - Standard Admission:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
AFRI 5800 [0.0]	Scholarly Preparation in African Studies	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
SOCI 6101 [0.0]	Introductory Doctoral Seminar	
<b>5. 1.0 credit in:</b>		<b>1.0</b>
SOCI 6102 [0.5]	Doctoral Seminar Year 1: Comprehensive Exam	
SOCI 6103 [0.5]	Doctoral Seminar Year 2: Research Design	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
SOCI 5008 [0.5]	Teaching Sociology	
OR one of the following:		
SOCI 5000 [0.5]	Classical Sociological Theory	
SOCI 5001 [0.5]	Special Topics in Classical Theory	
SOCI 5002 [0.5]	Contemporary Sociological Theory	
SOCI 5003 [0.5]	Special Topics in Contemporary Theory	
SOCI 5006 [0.5]	Thinking Sociologically	
SOCI 5308 [0.5]	Decolonizing Feminist Analyses	
SOCI 5309 [0.5]	Cultural Theory	
SOCI 5400 [0.5]	Political Sociology	
SOCI 5401 [0.5]	Critical Disability Studies	
SOCI 5402 [0.5]	Queer Migrations	
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies	
SOCI 5405 [0.5]	Power and Stratification	
SOCI 5407 [0.5]	Genealogies of Politics and Governance	
SOCI 5408 [0.5]	Feminism and Materialism	
SOCI 5501 [0.5]	Phenomenology for Anthropologists and Sociologists	

SOCI 5803 [0.5]	Critical Theory	
SOCI 5804 [0.5]	Modern Marxist Theory	
<b>7. 0.5 credit in</b>	SOCI courses at the 5000- or 6000-level or, with the permission of the graduate supervisor, up to 0.5 credit of graduate level course from another unit at Carleton	<b>0.5</b>
<b>8.</b>	Written and oral comprehensive examination in one area of specialization	
<b>9.</b>	Presentation of a thesis proposal	
<b>10. 0.0 credit in:</b>		<b>0.0</b>
SOCI 6909 [0.0]	Ph.D. Thesis (in the specialization)	
<b>11.</b>	An oral defence of the thesis	
<b>Total Credits</b>		<b>3.0</b>

### Ph.D. Sociology with Collaborative Specialization in African Studies (Advanced Completion Option - 2.5 credits)

Applicants to the Ph.D. Sociology with Collaborative Specialization in African Studies who have completed a master's program with specialization in African Studies may be considered for admission to an advanced completion option of the Ph.D.

#### Requirements - Advanced Completion Option:

<b>1. 0.5 credit in:</b>		<b>0.5</b>
AFRI 6000 [0.5]	Thinking from Africa: Historical Perspectives, Contemporary Dimensions	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
SOCI 6101 [0.0]	Introductory Doctoral Seminar	
<b>3. 1.0 credit in:</b>		<b>1.0</b>
SOCI 6102 [0.5]	Doctoral Seminar Year 1: Comprehensive Exam	
SOCI 6103 [0.5]	Doctoral Seminar Year 2: Research Design	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
SOCI 5008 [0.5]	Teaching Sociology	
OR one of the following:		
SOCI 5000 [0.5]	Classical Sociological Theory	
SOCI 5001 [0.5]	Special Topics in Classical Theory	
SOCI 5002 [0.5]	Contemporary Sociological Theory	
SOCI 5003 [0.5]	Special Topics in Contemporary Theory	
SOCI 5006 [0.5]	Thinking Sociologically	
SOCI 5308 [0.5]	Decolonizing Feminist Analyses	
SOCI 5309 [0.5]	Cultural Theory	
SOCI 5400 [0.5]	Political Sociology	
SOCI 5401 [0.5]	Critical Disability Studies	
SOCI 5402 [0.5]	Queer Migrations	
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies	
SOCI 5405 [0.5]	Power and Stratification	
SOCI 5407 [0.5]	Genealogies of Politics and Governance	
SOCI 5408 [0.5]	Feminism and Materialism	
SOCI 5501 [0.5]	Phenomenology for Anthropologists and Sociologists	
SOCI 5803 [0.5]	Critical Theory	
SOCI 5804 [0.5]	Modern Marxist Theory	

5. <b>0.5 credit in</b> SOCI at the 5000- or 6000-level or, with the permission of the graduate supervisor, up to 0.5 credit of graduate level course from another unit at Carleton	0.5
6. Written and oral comprehensive examination in one area of specialization	
7. Presentation of a thesis proposal	
8. <b>0.0 credit in:</b>	0.0
SOCI 6909 [0.0] Ph.D. Thesis (in the specialization)	
9. An oral defence of the thesis	
<b>Total Credits</b>	<b>2.5</b>

### Ph.D. Sociology with Collaborative Specialization in Political Economy (3.0 credits)

#### Requirements:

1. <b>0.5 credit in:</b>	0.5
PECO 6000 [0.5] Political Economy: Core Concepts	
2. <b>0.5 credit in:</b>	0.5
A relevant political economy course from the approved list or part of comprehensive preparation in the subfield of political economy	
3. <b>0.0 credit in:</b>	0.0
SOCI 6101 [0.0] Introductory Doctoral Seminar	
4. <b>1.0 credit in:</b>	1.0
SOCI 6102 [0.5] Doctoral Seminar Year 1: Comprehensive Exam	
SOCI 6103 [0.5] Doctoral Seminar Year 2: Research Design	
5. <b>0.5 credit in:</b>	0.5
SOCI 5008 [0.5] Teaching Sociology	
Or one of the following	
SOCI 5000 [0.5] Classical Sociological Theory	
SOCI 5001 [0.5] Special Topics in Classical Theory	
SOCI 5002 [0.5] Contemporary Sociological Theory	
SOCI 5003 [0.5] Special Topics in Contemporary Theory	
SOCI 5006 [0.5] Thinking Sociologically	
SOCI 5308 [0.5] Decolonizing Feminist Analyses	
SOCI 5309 [0.5] Cultural Theory	
SOCI 5400 [0.5] Political Sociology	
SOCI 5401 [0.5] Critical Disability Studies	
SOCI 5402 [0.5] Queer Migrations	
SOCI 5404 [0.5] Race, Ethnicity and Class in Contemporary Societies	
SOCI 5405 [0.5] Power and Stratification	
SOCI 5407 [0.5] Genealogies of Politics and Governance	
SOCI 5408 [0.5] Feminism and Materialism	
SOCI 5501 [0.5] Phenomenology for Anthropologists and Sociologists	
SOCI 5803 [0.5] Critical Theory	
SOCI 5804 [0.5] Modern Marxist Theory	
6. <b>0.5 credit in</b> SOCI courses at the 5000- or 6000-level or, with the permission of the graduate supervisor, up to 1.0 credit of graduate level courses from another unit at Carleton	0.5
7. Written and oral comprehensive examination in one area of specialization	
8. Presentation of a thesis proposal	

9. <b>0.0 credits in:</b>	0.0
SOCI 6909 [0.0] Ph.D. Thesis (in the specialization)	
10. An oral defence of the thesis	
<b>Total Credits</b>	<b>3.0</b>

### Comprehensive Examinations

Each Ph.D. candidate is required to write comprehensive examinations in one of the following areas:

- Theory and Methodology
- Stratification and Power
- Cultural Studies
- Applied Social Research

Subjects of instruction and research subsumed under these four areas are:

#### Theory and Methodology

- Logic of Social Scientific Inquiry
- Classical Social Theories
- Contemporary Social Theories
- Feminist Theories
- Research Methods (Historical, Qualitative, and Quantitative)

#### Stratification and Power

- Occupations, Organizations, and the Labour Process
- Class Analysis and Social Stratification
- Political Sociology
- Race and Ethnic Relations
- Gender Relations
- Political Economy
- Canadian Society
- Social and Economic Development
- Citizenship Studies
- Governance, Regulation, and Law

#### Cultural Studies

- Communication and Popular Cultures
- Ethnographic Analysis
- Discourse Analysis
- Social Anthropology
- Social and Virtual Spaces

#### Applied Social Research

- Criminal Justice
- Health and Illness Policy
- Population Studies
- Sociology of Language
- Built Environments
- Education Policy

Upon petition to the sociology graduate program's coordinator, an approved field in sociology or a related discipline may be substituted for one of the options above. The subjects of instruction and research subsumed under each of the areas are indicative, and may be subsumed under more than one area, depending on the analytic approach adopted.

The comprehensive examination must be completed no later than four terms after initial full-time registration, and eight terms after initial part-time registration.

The thesis proposal is to be presented after the comprehensive requirement has been completed. Normally the thesis proposal must be presented no later than two years or six terms after initial full-time registration, and four years or twelve terms after initial part-time registration.

## Graduate Diploma in Social Statistics and Data Analysis (2.0 credits)

### Requirements (Type 2 and 3):

<b>1. 0.5 credit in:</b>	<b>0.5</b>
SOCI 5102 [0.5] Multiple Regression Analysis	
<b>2. 0.5 credit in:</b>	<b>0.5</b>
SOCI 5104 [0.5] Advanced Multivariate Analysis	
<b>3. 0.5 credit in:</b>	<b>0.5</b>
SOCI 5809 [0.5] The Logic of the Research Process	
<b>4. 0.5 credit in</b> elective, which must include a research methods component and be offered at Carleton at the graduate or fourth-year undergraduate level and be approved by the SSDA GDip coordinator.	<b>0.5</b>
<b>Total Credits</b>	<b>2.0</b>

## Regulations

See the General Regulations section of this Calendar.

### Academic Standing

A grade of B- or better must normally be obtained in each credit counted toward the master's degree. With the recommendation of the department, and permission of the Dean of the Faculty of Graduate Studies and Research, a candidate may be allowed a grade of C+ in 1.0 credit.

### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the M.A. Sociology, including all concentrations and specializations, is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

## Regulations

See the General Regulations section of this Calendar.

Candidates must obtain a grade of B- or better in each credit, and Satisfactory on the comprehensive examinations, the Ph.D. thesis and its oral defence.

## Co-operative Education

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

## Application Requirements

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

## Participation Requirements

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.
- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

## Co-op Participation Agreement

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

## Communication with the Co-op Office

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

## Graduation with the Co-op Designation

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

## Employment

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

## **Work Term Assessment and Evaluation**

### **Work Term Evaluation**

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

### **Work Term Assessment**

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

### **Voluntary Withdrawal from the Co-op Option**

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

### **Involuntary or Required Withdrawal from the Co-op Option**

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### **International Students**

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

### **Co-op Fees**

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

### **Co-operative Education Option**

#### **M.A. Sociology with Concentration in Quantitative Methodology**

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the M.A. in Sociology, Concentration in Quantitative Methodology;
2. have successfully completed, by the start-date of the first work term, the required first-year core research methods courses (SOCI 5809 and at least 1.0 credit selected from: SOCI 5102, SOCI 5104, SOCI 5105, SOCI 5201, SOCI 5605);
3. be registered as a full-time student in each academic term prior to a work term;
4. be eligible to work in Canada (for off-campus work terms)

For more information, please refer to the Co-operative Education Policy.

### **Admission**

The requirement for admission into the master's program is a B.A. Honours or equivalent with at least high honours standing in sociology or a closely-related field. Where relevant, previous professional experience will be taken into account in determining an applicant's standing on admission.

Applicants with three-year non-honours bachelor's degrees may be admitted into a qualifying-year program designed to raise their standing to honours status. Students earning at least high honours standing in their qualifying-year courses will be considered for admission into the master's program. Refer to the General Regulations section of this Calendar for details of the regulations governing the qualifying year.

### **Accelerated Pathway**

The accelerated pathway in the Department of Sociology is a flexible and individualized plan of graduate study. Students in their final year of a Carleton B.A. Honours degree in Sociology, or equivalent, may qualify for this pathway.

Students in their third-year of study in the Carleton B.A. Honours degree in Sociology, or related discipline, should consult with both the Undergraduate Advisor and Graduate Advisor to determine if the accelerated pathway is appropriate for them and to confirm their selection of courses for their final year of undergraduate studies.

### **Accelerated Pathway Requirements**

1. Any two 0.5 credit 5000-level courses with a grade of B+ or higher
2. Minimal overall CGPA of B+

Students may receive advanced standing with transfer of up to 1.0 credit which can reduce their time to completion of the M.A.

### **Admission**

The minimum requirement for admission into the Ph.D. program is a master's degree (or the equivalent) in sociology, normally with a minimum average of B+ in courses (including the thesis where applicable), and with no grade below B

Applicants who have deficiencies in certain areas may be admitted to the Ph.D. program, but will normally be required to complete additional course work.

## **Admission**

### **Type 2 Concurrent Program**

At the time of admission, applicants to the Type 2 Graduate Diploma in Social Statistics and Data Analysis must be enrolled in a master's or doctoral program at Carleton University.

### **Type 3 Direct-entry Program**

Applicants to the Type 3 Graduate Diploma in Social Statistics and Data Analysis must hold a bachelor's degree. Admission for prospective students without a degree will be considered if they have relevant work experience.

## **Sociology (SOCI) Courses**

### **SOCI 5000 [0.5 credit]**

#### **Classical Sociological Theory**

Crucial sociological concepts and ideas by the founders of sociology. Attention will be given to Marx, Weber, Durkheim, Pareto, Comte, and Husserl.

### **SOCI 5001 [0.5 credit]**

#### **Special Topics in Classical Theory**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

### **SOCI 5002 [0.5 credit]**

#### **Contemporary Sociological Theory**

Major theoretical perspectives in sociology, including social behaviourism; social action theories such as symbolic interactionism, phenomenological sociology, ethnomethodology; and structuralist theories such as structural functionalism, neo-Marxism and critical theory.

### **SOCI 5003 [0.5 credit]**

#### **Special Topics in Contemporary Theory**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

### **SOCI 5005 [0.5 credit]**

#### **Recurring Debates in Social Thought**

Recurring issues and debates in the discipline. Topics such as the nature of social science; the objective world versus social construction; questions of evidence, meaning and measurement; agency versus structure; the relation between research and praxis; knowledge and power, may be considered.

Prerequisite(s): restricted to graduate students in sociology. Others may be admitted by permission of the Department.

### **SOCI 5006 [0.5 credit]**

#### **Thinking Sociologically**

Critical examination of various theoretical approaches and the role of social theory in research and society.

### **SOCI 5008 [0.5 credit]**

#### **Teaching Sociology**

A theory and hands-on course on university teaching for those who are starting to teach or will soon teach their first courses. Explores links between critical pedagogy and university teaching practices.

Includes: Experiential Learning Activity

### **SOCI 5102 [0.5 credit]**

#### **Multiple Regression Analysis**

An in-depth study of multiple regression analysis and its application in social science research. Interpretation and communication of the results are emphasized. The course provides an overview of descriptive and inferential statistics. Students learn how to use STATA/SAS to analyze social survey data.

Includes: Experiential Learning Activity

### **SOCI 5104 [0.5 credit]**

#### **Advanced Multivariate Analysis**

Commonly-used advanced statistical techniques. Topics may include factor analysis, multinomial logistic regression analysis, event history analysis, analysis of covariance, multilevel models and structural equation modeling. STATA/SAS is used in addition to specialized statistical software.

Includes: Experiential Learning Activity

### **SOCI 5105 [0.5 credit]**

#### **Special Topics in Social Research**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

### **SOCI 5106 [0.5 credit]**

#### **Research Design and Data Analysis**

An integrated approach to the problems involved in the analysis of quantitative data, research design and procedures.

Includes: Experiential Learning Activity

### **SOCI 5107 [0.5 credit]**

#### **Advanced Qualitative Research Methods**

In-depth study of a range of qualitative research methodologies. Students will sharpen their practical skills in developing research questions, gathering and analyzing data and presenting results. Students will engage in discussions of theoretical, methodological, and ethical issues and challenges in qualitative research.

**SOCI 5201 [0.5 credit]****Comparative Methods in Social Research**

Current analytical problems and applications of comparative methods in social research. Students are expected to individually conduct research or to participate in a group research project in which one or more of these methods will be applied.

Includes: Experiential Learning Activity

**SOCI 5205 [1.0 credit]****Canadian Society**

A critical examination of sociological models of modern societies and their relevance to Canada.

**SOCI 5206 [0.5 credit]****Sociology of Occupations and Professions**

A consideration of the development of occupational recruitment patterns and workforce issues, with attention to their sociological implications.

**SOCI 5207 [0.5 credit]****Sociology of Formal Organizations**

A consideration of the forms and processes of bureaucracy in modern society, government and industry.

**SOCI 5209 [0.5 credit]****Sociology of Science and Technology**

Study of the interaction among science, technology and change in modern societies.

**SOCI 5303 [0.5 credit]****Sociology of Education**

The relations between education and other social institutions, the structure of educational opportunity, educational systems and organizations, and the sociology of learning.

**SOCI 5304 [0.5 credit]****Food Studies**

A sociological analysis of food cultures. Possible topics include: the relationship between food and identity; social movements organized around food; and the production, preparation, consumption, and disposal of food.

**SOCI 5305 [0.5 credit]****Police and Capital**

The idea of 'police' as a general historical project aimed at the fabrication of social order and the development of liberal philosophy, political economy and security. Contemporary public and private security provision considered in light of commodification, class conflict, and risk thinking.

Also listed as LAWS 5306.

**SOCI 5306 [0.5 credit]****Cultural Studies**

The relations between cultural practices and other social practices in definite social formations. Discussions are grounded through the choice of specific Canadian research on topics such as media, art, music, education, pedagogy, etc.

**SOCI 5308 [0.5 credit]****Decolonizing Feminist Analyses**

An examination of contemporary feminist approaches, including critical race perspectives on intersectionality and post-colonial feminism. Special emphasis on perspectives of Indigenous women and issues of settler-colonialism in Canada and elsewhere.

**SOCI 5309 [0.5 credit]****Cultural Theory**

A survey of developments in European and North American Marxist and Post-Marxist cultural theories of the past quarter century.

**SOCI 5400 [0.5 credit]****Political Sociology**

An examination of theoretical and empirical work on selected aspects of the state, politics and political behaviour, primarily in North America and Europe.

**SOCI 5401 [0.5 credit]****Critical Disability Studies**

Course engages contemporary disability theory, culture, and activism to consider bodily difference and its relation to the workings of power and social control, accessibility, normalization, ableism, and medicalization. Students will gain an understanding of the contemporary debates, theories, and methodologies of critical disability studies. Also listed as ACCS 5001.

**SOCI 5402 [0.5 credit]****Queer Migrations**

Intersections of sexual and gender non-conformity and international migration using queer, anti-colonial, anti-racist and feminist theories. Examination of colonial histories of heteronormativity and contemporary manifestations of sexual (geo)politics.

**SOCI 5403 [0.5 credit]****The Sociology of Solidarity**

The possibilities and practices of solidarity raise core questions about how we understand the social, the other and how we can live together. The course explores these questions in inter-personal, community and global contexts.

**SOCI 5404 [0.5 credit]****Race, Ethnicity and Class in Contemporary Societies**

Various theoretical approaches concerning the persistence and re-emergence of ethnic and/or racial groups are examined. Particular emphasis is given to the intersection and overlap of ethnicity and race with social class.

**SOCI 5405 [0.5 credit]****Power and Stratification**

An examination of theories of elite behaviour, social class, and ideology.

**SOCI 5406 [0.5 credit]****Citizenship and Globalization**

Examination of debates about the changing nature of citizenship in the context of globalization of capital, culture and peoples. Employing post-Marshallian, political economic, post-structuralist, post-colonial and feminist perspectives, the seminar explores the emergence of market-driven, hierarchical and cosmopolitan notions of citizenship and transnational identities.

**SOCI 5407 [0.5 credit]****Genealogies of Politics and Governance**

Examination of Foucault's genealogical method for doing critical studies of politics and governance. Topics may include governmentality, sovereignty, biopolitics, neoliberalism, citizenship, and colonialism.

Also listed as PSCI 5303.

Also offered at the undergraduate level, with different requirements, as PSCI 4303, for which additional credit is precluded.

**SOCI 5408 [0.5 credit]****Feminism and Materialism**

Recent developments of feminist materialist theory and analyses. Topics may include: the gender division of labour; family and economy; gender and class; gender, race and ethnicity; sexuality; reproduction; theory and politics.

**SOCI 5409 [0.5 credit]****The Politics of Social Movements and the State**

Origins, ideologies, strategies and political implications of social and popular movements. May include attention to the peace, feminist, LGBT2SQ, disability, ecology, and anti-racism movements, as well as conservative, religious, and ethnonationalist movements.

**SOCI 5501 [0.5 credit]****Phenomenology for Anthropologists and Sociologists**

This seminar builds theoretical and methodological bridges between phenomenology and anthropology/sociology. Students read key texts from, among others, Husserl, Heidegger, Merleau-Ponty, Plessner, Schultz, and Waldenfels and learn to apply concepts in research. Topics include body and senses, intersubjectivity and life-world, selfhood and otherness.

Also listed as ANTH 5501.

Seminar

**SOCI 5502 [0.5 credit]****Special Topics in Work and Labour II**

Topics and emphasis vary from term to term according to current policies and events influencing the distribution and benefits of work and labour including migration, technological and environmental change, privatization, austerity, and transnational legislation.

Also listed as PECO 5504.

**SOCI 5503 [0.5 credit]****Special Topics in Work and Labour I**

Topics and emphasis vary from term to term according to current policies and events influencing the distribution and benefits of work and labour including migration, technological and environmental change, privatization, austerity, and transnational legislation.

Also listed as PECO 5503.

**SOCI 5504 [0.5 credit]****Special Topics in Political Economy I**

A special topic from current research in political economy.

As the topic varies from year to year, students should check with the Department regarding the current offering.

Also listed as PECO 5501, PSCI 5501.

**SOCI 5505 [0.5 credit]****Special Topics in Political Economy II**

A special topic from current research in political economy.

As the topic varies from year to year, students should check with the Department regarding the current offering.

Also listed as PECO 5502, PSCI 5502.

**SOCI 5600 [0.5 credit]****Critical Discourse Analysis**

Examination of the relations between discourse, social semiotics, extradiscursive semiotics and social organization.

**SOCI 5605 [0.5 credit]****Demographic Analysis**

Examination of classical debates and contemporary demographic issues such as low fertility, population aging and migration policies. Introduction to the concepts, tools and techniques that demographers use; focus on empirical demographic research.

**SOCI 5606 [0.5 credit]****Special Topics in Sociology**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

**SOCI 5607 [0.5 credit]****Contemporary Theories of Crime and Social Regulation**

Recent developments in theories of criminality and social regulation. Particular reference will be made to the regulatory mechanisms of both public and private spheres within legal institutions, corrections, economic institutions, and the family.

**SOCI 5707 [0.5 credit]****Crime, Social Control and Social Change**

An examination of the role of the discourses and ideologies surrounding crime, criminal processes, and social change. Topics may include such issues as juvenile justice, victimization, corporate crime, criminalization of indigenous peoples, substance use and abuse.

**SOCI 5708 [0.5 credit]****Contemporary Criminology Issues**

This team-taught seminar addresses a series of contemporary issues in criminology and criminal justice. It introduces students to the research of a number of faculty from Sociology and Anthropology, Law and Legal Studies, or Criminology and Criminal Justice.

**SOCI 5802 [0.5 credit]****Departmental Seminar**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

**SOCI 5803 [0.5 credit]****Critical Theory**

Recent developments in critical theory based upon its initial formulation by the Frankfurt School, with emphasis upon particular contemporary theories in a given year, e.g., J. Habermas, H. Willems, etc.

**SOCI 5804 [0.5 credit]****Modern Marxist Theory**

An examination of topics of theory and research in modern Marxist literature; the central focus is on problems of class analysis, the state, and politics in advanced capitalist societies.

**SOCI 5805 [0.5 credit]****Special Topics in Sociology**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

**SOCI 5806 [0.5 credit]****Special Topics in Sociology**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

**SOCI 5809 [0.5 credit]****The Logic of the Research Process**

An examination of the research process, including the phases of conceptualization, choice of indicators, sampling, data collection, and analysis. Published articles will be studied as exemplars of the range of possible research strategies.

Includes: Experiential Learning Activity

**SOCI 5900 [0.5 credit]****Tutorial****SOCI 5904 [0.5 credit]****The Craft of Writing**

Theoretical and practical resources for writing with ease at the graduate level. Techniques and tools for drafting, revision, elements of style, time and guilt management, and inspiration and liveliness as key parts of academic writing.

**SOCI 5906 [0.5 credit]****Placement in Sociology**

This course provides an opportunity to enhance educational experience through work placement. Students may not be enrolled in the Co-operative Work Term (SOCI 5913) and the Placement in Sociology (SOCI 5906) simultaneously.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the Department.

**SOCI 5908 [1.0 credit]****M.A. Research Essay**

Students may enrol in this course for a maximum of three consecutive terms of study, including one summer term. Students must enrol in this course not later than the beginning of the second full year of study.

Includes: Experiential Learning Activity

**SOCI 5909 [2.0 credits]****M.A. Thesis**

Includes: Experiential Learning Activity

**SOCI 5913 [0.0 credit]****Co-operative Work Term**

Includes: Experiential Learning Activity

Prerequisite(s): registration in the Sociology Master of Arts Cooperative Education program.

**SOCI 6001 [0.5 credit]****Special Topics in Sociology**

Topic varies from year to year. Students should check with the Department regarding the topic offered.

**SOCI 6101 [0.0 credit]****Introductory Doctoral Seminar**

Helps students to further develop their skills in grant applications writing, scholarly writing and conference presentations. Guides students in forming a supervisory committee, deciding on a comprehensive exam field, and preparing a reading list. Graded SAT/UNS.

**SOCI 6102 [0.5 credit]****Doctoral Seminar Year 1: Comprehensive Exam**

Development of self-awareness and skills as sociological scholars and writers. Topics include foundations of sociological research, critical literature reviews, and attendant theoretical issues. Supports students in research work management and writing their comprehensive exam paper.

Precludes additional credit for SOCI 6002 (no longer offered).

Prerequisite(s): SOCI 6101.

**SOCI 6103 [0.5 credit]****Doctoral Seminar Year 2: Research Design**

Topics include foundations of sociological research design and research methods. Supports students in writing their dissertation research proposal; breaks down into stages the crafting and drafting of the proposal. Continued attention to research work management and scholarly writing and conference presentations.

Precludes additional credit for SOCI 6003 (no longer offered).

Prerequisite(s): SOCI 6102.

**SOCI 6900 [0.5 credit]****Tutorial****SOCI 6909 [0.0 credit]****Ph.D. Thesis**

Includes: Experiential Learning Activity

## Sustainable Energy

This section presents the requirements for programs in:

- **Master of Public Policy - Sustainable Energy and the Environment**
- **Master of Public Policy - Sustainable Energy and the Environment with Collaborative Specialization in Climate Change**
- **M.A.Sc. Sustainable Energy**
- **M.Eng. Sustainable Energy**
- **M.Eng. Sustainable Energy with Collaborative Specialization in Climate Change**

### Master of Public Policy - Sustainable Energy and the Environment (5.0 credits)

#### Requirements - Coursework pathway:

<b>1. 1.5 credits in:</b>	<b>1.5</b>
SERG 5002 [0.5]	Sustainable Energy Engineering for Policy Students
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools
SERG 5005 [0.5]	Applied Interdisciplinary Project
<b>2. 0.0 credit in:</b>	<b>0.0</b>
SERG 5800 [0.0]	Sustainable Energy Seminar
<b>3. 0.5 credit in:</b>	<b>0.5</b>
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change
<b>4. 0.5 credit in:</b>	<b>0.5</b>
PADM 5510 [0.5]	Energy Economics
<b>5. 0.5 credit in:</b>	<b>0.5</b>
PADM 5515 [0.5]	Sustainable Energy Policy
or PADM 5615 [0.5]	Politics and Policy of Energy in Canada
<b>6. 2.0 credits from</b>	<b>2.0</b>
Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor	
<b>Total Credits</b>	<b>5.0</b>

#### Requirements - Research essay pathway:

<b>1. 1.5 credits in:</b>	<b>1.5</b>
SERG 5002 [0.5]	Sustainable Energy Engineering for Policy Students
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools
SERG 5005 [0.5]	Applied Interdisciplinary Project
<b>2. 0.0 credit in:</b>	<b>0.0</b>
SERG 5800 [0.0]	Sustainable Energy Seminar
<b>3. 0.5 credit in:</b>	<b>0.5</b>
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change
<b>4. 0.5 credit in:</b>	<b>0.5</b>
PADM 5510 [0.5]	Energy Economics
<b>5. 0.5 credit in:</b>	<b>0.5</b>
PADM 5515 [0.5]	Sustainable Energy Policy
or PADM 5615 [0.5]	Politics and Policy of Energy in Canada
<b>6. 1.0 credits from</b>	<b>1.0</b>
Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor	
<b>7. 1.0 credit in:</b>	<b>1.0</b>

PADM 5908 [1.0]	Research Essay	
<b>Total Credits</b>		<b>5.0</b>
<b>Requirements - Thesis pathway:</b>		
<b>1. 1.5 credits in:</b>		<b>1.5</b>
SERG 5002 [0.5]	Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>2. 0.0 credit in:</b>		<b>0.0</b>
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>3. 0.5 credit in:</b>		<b>0.5</b>
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
<b>4. 0.5 credit in:</b>		<b>0.5</b>
PADM 5510 [0.5]	Energy Economics	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
PADM 5515 [0.5]	Sustainable Energy Policy	
or PADM 5615 [0.5]	Politics and Policy of Energy in Canada	
<b>6. 2.0 credits in:</b>		<b>2.0</b>
SERG 5909 [2.0]	MA Sustainable Energy Thesis	
<b>Total Credits</b>		<b>5.0</b>

**Notes:**

1. Courses must be appropriate to the student's qualifications and selected with the approval of the student's program supervisor.

**Master of Public Policy - Sustainable Energy and the Environment with Collaborative Specialization in Climate Change (6.0 credits)**

<b>Requirements - Coursework pathway:</b>		
<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		<b>1.5</b>
SERG 5002 [0.5]	Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
PADM 5510 [0.5]	Energy Economics	
<b>7. 0.5 credit in:</b>		<b>0.5</b>
PADM 5515 [0.5]	Sustainable Energy Policy	
or PADM 5615 [0.5]	Politics and Policy of Energy in Canada	
<b>8. 2.0 credits from</b>	<b>Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor</b>	<b>2.0</b>
<b>Total Credits</b>		<b>6.0</b>

**Requirements - Research essay pathway:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		<b>1.5</b>
SERG 5002 [0.5]	Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
PADM 5510 [0.5]	Energy Economics	
<b>7. 0.5 credit in:</b>		<b>0.5</b>
PADM 5515 [0.5]	Sustainable Energy Policy	
or PADM 5615 [0.5]	Politics and Policy of Energy in Canada	
<b>6. 1.0 credit from</b>	<b>Sustainable Energy Policy courses listed below or other courses as approved by the MA supervisor</b>	<b>1.0</b>
<b>8. 1.0 credit in:</b>		<b>1.0</b>
PADM 5908 [1.0]	Research Essay (in the specialization)	
<b>Total Credits</b>		<b>6.0</b>

**Requirements - Thesis pathway:**

<b>1. 1.0 credit in:</b>		<b>1.0</b>
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		<b>1.5</b>
SERG 5002 [0.5]	Sustainable Energy Engineering for Policy Students	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>		<b>0.0</b>
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>		<b>0.5</b>
PADM 5121 [0.5]	Policy Analysis: The Practical Art of Change	
<b>6. 0.5 credit in:</b>		<b>0.5</b>
PADM 5510 [0.5]	Energy Economics	
<b>7. 0.5 credit in:</b>		<b>0.5</b>
PADM 5515 [0.5]	Sustainable Energy Policy	
or PADM 5615 [0.5]	Politics and Policy of Energy in Canada	
<b>8. 2.0 credits in:</b>		<b>2.0</b>
SERG 5909 [2.0]	MA Sustainable Energy Thesis (in the specialization)	
<b>Total Credits</b>		<b>6.0</b>

**Notes:**

1. Courses must be appropriate to the student's qualifications and selected with the approval of the student's program supervisor.

## M.A.Sc. Sustainable Energy (5.0 credits)

### M.A.Sc. Sustainable Energy (5.0 credits)

<b>1. 1.0 credit in:</b>		1.0
SERG 5001 [0.5]	Sustainable Energy Policy for Engineers	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
<b>2. 0.0 credit in:</b>		0.0
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>3. 1.5 credits in:</b>		
Mechanical Engineering focus:		
1.5 credits in Mechanical Energy Conversion courses (listed below), or Sustainable Energy Policy courses. A maximum of 0.5 credits in Sustainable Energy Policy courses will be allowed.		1.5
or		
Electrical Engineering focus:		
1.5 credit in Efficient Electrical Energy Systems courses (listed below) or Sustainable Energy Policy courses. A maximum of 0.5 credits in Sustainable Energy Policy courses will be allowed.		
<b>4. 2.5 credits in M.A.Sc. thesis:</b>		2.5
MECH 5909/ SYSC 5909/ ELEC 5909 [2.5]	M.A.Sc. Thesis	
<b>Total Credits</b>		<b>5.0</b>

## M.Eng. Sustainable Energy (5.0 credits)

### Requirements:

<b>1. 1.5 credits in:</b>		1.5
SERG 5001 [0.5]	Sustainable Energy Policy for Engineers	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>2. 0.0 credit in:</b>		0.0
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>3. 1.5 credits in:</b>		1.5
<b>Mechanical Engineering focus:</b>		
1.5 credits in Mechanical Energy Conversion courses (listed below), or Sustainable Energy Policy courses. A maximum of 0.5 credits in Sustainable Energy Policy courses will be allowed.		
or		
<b>Electrical Engineering focus:</b>		
1.5 credit in Efficient Electrical Energy Systems courses (listed below) or Sustainable Energy Policy courses. A maximum of 0.5 credits in Sustainable Energy Policy courses will be allowed.		
<b>4. 2.0 credits in:</b>		2.0
<b>Mechanical Engineering focus:</b>		
Graduate-level MECH courses		
or		
<b>Electrical Engineering focus:</b>		
Graduate level ELEC, SYSC or EACJ courses		
<b>Total Credits</b>		<b>5.0</b>

## M.Eng. Sustainable Energy with Collaborative Specialization in Climate Change (5.0 Credits)

### Requirements:

<b>1. 1.0 credit in:</b>		1.0
CLIM 5000 [1.0]	Climate Collaboration	
<b>2. 0.0 credit in:</b>		
CLIM 5800 [0.0]	Climate Seminar Series	
<b>3. 1.5 credits in:</b>		1.5
SERG 5001 [0.5]	Sustainable Energy Policy for Engineers	
SERG 5003 [0.5]	Energy Evaluation and Assessment Tools	
SERG 5005 [0.5]	Applied Interdisciplinary Project	
<b>4. 0.0 credit in:</b>		
SERG 5800 [0.0]	Sustainable Energy Seminar	
<b>5. 0.5 credit in:</b>		0.5
<b>Mechanical Engineering Focus:</b>		
Mechanical Energy Conversion courses (listed below), or Sustainable Energy Policy courses		
or		
<b>Electrical Engineering focus:</b>		
Efficient Electrical Energy Systems courses (listed below) or Sustainable Energy Policy courses		
<b>6. 2.0 credits in:</b>		2.0
<b>Mechanical Engineering focus:</b>		
Graduate-level MECH courses		
or		
<b>Electrical Engineering focus:</b>		
Graduate-level ELEC, SYSC or EACJ courses		
<b>Total Credits</b>		<b>5.0</b>

### Courses - Mechanical Energy Conversion

MECH 5006 [0.5]	Solar Energy
MECH 5009 [0.5]	Environmental Fluid Mechanics Relating to Energy Utilization
MECH 5201 [0.5]	Methods of Energy Conversion
MECH 5203 [0.5]	Nuclear Engineering
MECH 5204 [0.5]	Fundamentals of Combustion
MECH 5205 [0.5]	Building Performance Simulation
MECH 5206 [0.5]	Wind Engineering
MECH 5402 [0.5]	Gas Turbines
ENVE 5101 [0.5]	Air Pollution Control
SERG 5906 [0.5]	Directed Studies in Sustainable Energy
<b>With the approval of the Department, the following courses may be included in the above list:</b>	
CIVE 5705 [0.5]	Topics in Structures
CIVE 5706 [0.5]	Topics in Structures
CIVE 5707 [0.5]	Topics in Structures
CIVE 5708 [0.5]	Topics in Structures
CIVE 5709 [0.5]	Topics in Structures
ENVE 5701 [0.5]	Topics in Environmental Engineering
ENVE 5702 [0.5]	Topics in Environmental Engineering
ENVE 5703 [0.5]	Topics in Environmental Engineering

ENVE 5704 [0.5]	Topics in Environmental Engineering	
ENVE 5705 [0.5]	Topics in Environmental Engineering	
MECH 5800 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
MECH 5801 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
MECH 5802 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
MECH 5803 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
MECH 5804 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
MECH 5805 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
MECH 5806 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
MECH 5807 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
MECH 5808 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
MECH 5809 [0.5]	Special Topics in Mechanical and Aerospace Engineering	
<b>Courses - Efficient Electrical Energy Systems</b>		
ELEC 5200 [0.5]	Advanced Topics in Integrated Circuits and Devices	0.5
ELEC 5302 [0.5]	Renewable and Distributed Energy Resource Technologies	0.5
ELEC 5405 [0.5]	Advanced Linear and Nonlinear Circuit Theory and Applications	0.5
ELEC 5509 [0.5]	Integrated Circuit Technology	0.5
ELEC 5707 [0.5]	Microsensors and MEMS	0.5
ELEC 5808 [0.5]	Signal Processing Electronics	0.5
ELEC 5900 [0.5]	Engineering Project I	0.5
SYSC 5001 [0.5]	Simulation and Modeling	0.5
SYSC 5004 [0.5]	Optimization for Engineering Applications	0.5
SYSC 5103 [0.5]	Software Agents	0.5
SYSC 5104 [0.5]	Methodologies For Discrete-Event Modeling And Simulation	0.5
SYSC 5105 [0.5]	Software Quality Engineering and Management	0.5
SYSC 5207 [0.5]	Distributed Systems Engineering	0.5
SYSC 5401 [0.5]	Adaptive and Learning Systems	0.5
SERG 5906 [0.5]	Directed Studies in Sustainable Energy	0.5

#### **Courses - Sustainable Energy Policy**

PADM 5510 [0.5]	Energy Economics
PADM 5511 [0.5]	Energy Management
PADM 5512 [0.5]	International Politics of Sustainable Energy
PADM 5572 [0.5]	Policy Seminar (Sustainable Energy)
PADM 5611 [0.5]	Science and Technology Policies
PADM 5612 [0.5]	Industrial Policy, Innovation and Sustainable Production
PADM 5614 [0.5]	Natural Resource Management
PADM 5616 [0.5]	Environmental Policy

PADM 5618 [0.5]	Environmental and Ecological Economics
PADM 5619 [0.5]	Urban Sustainability
PADM 5620 [0.5]	The Science, Politics and Economics of Global Climate Change
SERG 5906 [0.5]	Directed Studies in Sustainable Energy
Other courses as approved by the MA supervisor	

### **Regulations**

See the General Regulations section of this Calendar.

#### **Academic Standing**

A grade of B- or better must be obtained in each course counted towards the master's degree.

#### **Full-time Continuation**

Students will be required to withdraw from the program if their weighted grade point average falls below 7.0 (B-) after two terms of full-time study (or equivalent), or if they receive a grade of less than B- in any two courses they have registered in.

#### **Part- time Continuation**

Students will be required to withdraw from the program if their weighted grade point average falls below 7.0 (B-) after completing 2.0 credits, or if they receive a grade of less than B- in any two courses they have registered in.

#### **Regularly Scheduled Break**

For immigration purposes, the summer term (May to August) for the

- Master of Public Policy in Sustainable Energy and the Environment (coursework pathway)
- Master of Public Policy in Sustainable Energy and the Environment with Collaborative Specialization in Climate Change (coursework pathway)

is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### **Regulations**

See the General Regulations section of this Calendar.

#### **Academic Standing**

A grade of B- or better must be obtained in each course counted towards the master's degree.

#### **Full-time Continuation**

Students will be required to withdraw from the program if their weighted grade point average falls below 7.0 (B-) after two terms of full-time study (or equivalent), or if they receive a grade of less than B- in any two courses they have registered in.

### **Part-time Continuation**

Students will be required to withdraw from the program if their weighted grade point average falls below 7.0 (B-) after completing 2.0 credits, or if they receive a grade of less than B- in any two courses they have registered in.

### **Regulations**

See the General Regulations section of this Calendar.

### **Academic Standing**

A grade of B- or better must be obtained in each course counted towards the master's degree.

### **Full-time Continuation**

Students will be required to withdraw from the program if their weighted grade point average falls below 7.0 (B-) after two terms of full-time study (or equivalent), or if they receive a grade of less than B- in any two courses they have registered in.

### **Part-time Continuation**

Students will be required to withdraw from the program if their weighted grade point average falls below 7.0 (B-) after completing 2.0 credits, or if they receive a grade of less than B- in any two courses they have registered in.

### **Regularly Scheduled Break**

For immigration purposes, the summer term (May to August) for the M.Eng. Sustainable Energy (coursework and project pathways only) is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### **Admission**

Applicants must have a bachelor's degree (or equivalent), with an average of B+ or higher. The level of academic performance and potential demonstrated within the degree is more important than the discipline; students may enter the program from a wide variety of academic backgrounds in the social sciences, humanities, sciences and engineering. Mid-career applicants who do not have a bachelor's degree, but who have demonstrated professional excellence over a number of years of work in the public sector will also be considered.

All applicants must have completed 1.0 credit in university-level micro- and macroeconomic theory (ECON 1000 [1.0] or the equivalent)

0.5 credit in PSCI at the 2000-level or higher, dealing with institutions and processes by which governments legitimize and exercise power, ideally in a Canadian setting (PSCI 2003 or equivalent).

A working knowledge of algebra is also expected.

In some cases, applicants may be admitted to the program despite not having completed one of these prerequisite courses in economics or political science, on the condition that the course be completed with a grade of B- or higher

in the first year of the program. It is strongly recommended that students complete the prerequisites before starting the program, to ensure that their progress through the core courses is unimpeded.

Students whose first language is not English or who have not completed a previous degree at an English speaking university must demonstrate an adequate command of English by attaining, at least, a TOEFL score of 237 CBT (computer-based test) or 580 (written); or 86 IBT overall with a minimum score in each component of: writing: 22; speaking: 22; reading: 20; and listening: 20, or a CAEL score of 70, or an IELTS score of 7.0.

### **Admission**

Applicants must have a bachelor's degree (or equivalent) in a discipline relevant to engineering disciplinary foundations.

Normally, an average of B+ or higher is required for admission.

### **Admission**

Applicants must have a bachelor's degree (or equivalent) in a discipline relevant to engineering disciplinary foundations.

Normally, an average of B+ or higher is required for admission.

### **Co-operative Education**

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

### **Application Requirements**

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on, provided that they have mandatory credits remaining for degree completion.

### **Participation Requirements**

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.
- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term

- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

### **Co-op Participation Agreement**

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

### **Communication with the Co-op Office**

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

### **Graduation with the Co-op Designation**

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

### **Employment**

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

### **Work Term Assessment and Evaluation**

#### **Work Term Evaluation**

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

#### **Work Term Assessment**

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

### **Voluntary Withdrawal from the Co-op Option**

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

### **Involuntary or Required Withdrawal from the Co-op Option**

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

### **International Students**

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

### **Co-op Fees**

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

### **Co-operative Education Option**

#### **Master of Public Policy - Sustainable Energy and the Environment**

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the Master of Public Policy, Sustainable Energy and the Environment (MPP-SEE);
2. have successfully completed, by the start-date of the first work term, at least 2.0 credits of core MPP-SEE courses;
3. be registered as a full-time student in each academic term prior to a work term;
4. be eligible to work in Canada (for off-campus work terms)

*For more information, please refer to the Co-operative Education Policy.*

### **Co-operative Education**

For information about how to apply for the Co-op program and how the Co-op program works, visit the Co-op website.

All graduate students participating in the Co-op program are governed by this Graduate Co-operative Education Policy.

### **Application Requirements**

Graduate students are encouraged to apply to the Co-op Program during their first term of studies. Alternatively, students may delay their participation until later on,

provided that they have mandatory credits remaining for degree completion.

## **Participation Requirements**

Graduate students:

- must be registered as full-time before they begin their co-op job search and their co-op work term.
- will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- are not permitted to hold a Teaching Assistantship while on a co-op work term. Where eligible, Teaching Assistantships will be deferred to a later term.
- in receipt of internal or external scholarships should contact Graduate Studies to discuss the possible funding implications of being on a co-op work term
- must have mandatory courses left to complete following their final co-op work term. In cases where the graduate student has just a 0.5 credit left, he or she may request permission of the Co-op Office to complete this course during the work term.

## **Co-op Participation Agreement**

All graduate students must adhere to the policies found within the Co-op Participation Agreement.

## **Communication with the Co-op Office**

Graduate students must maintain regular contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the student's Carleton email account.

## **Graduation with the Co-op Designation**

In order to graduate with the Co-op Designation, graduate students must satisfy all requirements of the degree program in addition to the successful completion of two work terms. Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

## **Employment**

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

## **Work Term Assessment and Evaluation**

### **Work Term Evaluation**

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

### **Work Term Assessment**

In order to successfully complete the co-op work term, graduate students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

### **Voluntary Withdrawal from the Co-op Option**

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the requirements of the work term.

### **Involuntary or Required Withdrawal from the Co-op Option**

Graduate students may be removed from the Co-op Program for any of the following reasons:

1. Failure to attend all interviews for positions to which the student has applied;
2. Declining more than one job offer during the job search;
3. Reneging on a co-op position that the student has accepted either verbally or in writing;
4. Continuing a job search after accepting a co-op position;
5. Dismissal from a work term by the co-op employer;
6. Leaving a work term without approval from the Co-op Management Team;
7. Receipt of an unsatisfactory work term evaluation;
8. Receiving a grade of UNS on the work term report;

## **International Students**

**All Graduate International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.**

## **Co-op Fees**

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

## **Co-operative Education Option**

### **M. Eng. Sustainable Energy**

Students are encouraged to apply for admission to the Co-operative Education Program by the end of their first term of academic study.

To be eligible for admission to Co-op, students must:

1. be enrolled in the Master of Engineering Sustainable Energy;

2. have successfully completed, by the start-date of the first work term, a minimum of 2.0 credits towards the M.Eng program, including SERG 5001 Sustainable Energy Policy for Engineers;
3. obtained a minimum CGPA of 9.0;
4. be registered as a full-time student in each academic term prior to a work term;
5. be eligible to work in Canada (for off-campus work terms)

For more information, please refer to the Co-operative Education Policy.

## **Sustainable Energy (SERG) Courses**

### **SERG 5001 [0.5 credit]**

#### **Sustainable Energy Policy for Engineers**

This course introduces engineering students to the policy world by examining political and policy institutions, and covering basic principles of policy analysis, as they relate to the energy realm.

### **SERG 5002 [0.5 credit]**

#### **Sustainable Energy Engineering for Policy Students**

This course introduces policy students to fundamental principles of engineering, particularly as they relate to energy production, transformation and consumption.

### **SERG 5003 [0.5 credit]**

#### **Energy Evaluation and Assessment Tools**

Introduction to principles and tools for financial and performance analysis of energy projects, systems and technologies, and their application. Topics may include: probability theory, regression analysis, cost-benefit analysis, life cycle analysis, carbon accounting and emissions modeling, and other techniques particular to the energy field.

### **SERG 5004 [1.0 credit]**

#### **Applied Interdisciplinary Project**

Application of assessment tools, energy evaluation methods, engineering, economics and policy studies to actual sustainable energy projects.

Includes: Experiential Learning Activity

Precludes additional credit for SERG 5000 (no longer offered).

Prerequisite(s): SERG 5003 and one of SERG 5001 or SERG 5002.

### **SERG 5005 [0.5 credit]**

#### **Applied Interdisciplinary Project**

Application of assessment tools, energy evaluation methods, engineering, economics and policy studies to actual sustainable energy projects.

Includes: Experiential Learning Activity

Precludes additional credit for SERG 5004.

Prerequisite(s): SERG 5003 and one of SERG 5001 or SERG 5002.

### **SERG 5800 [0.0 credit]**

#### **Sustainable Energy Seminar**

A series of seminars presented by researchers and practitioners in the area of sustainable energy. To complete this course, a student must attend at least ten seminars during their program.

### **SERG 5906 [0.5 credit]**

#### **Directed Studies in Sustainable Energy**

A directed course on selected subjects related to sustainable energy as approved by a course supervisor.

### **SERG 5909 [2.0 credits]**

#### **MA Sustainable Energy Thesis**

Includes: Experiential Learning Activity

### **SERG 5913 [0.0 credit]**

#### **Co-operative Work term**

Includes: Experiential Learning Activity

# Teaching English as an Additional Language

This section presents the requirements for programs in:

- **M.A. Teaching English as an Additional Language**

## Program Requirements

### M.A. Teaching English as an Additional Language (5.0 credits)

<b>1. 3.0 credits in:</b>	<b>3.0</b>
TEAL 5206 [0.5]	Introduction to TEAL Theory
TEAL 5207 [0.5]	Pedagogical Grammar in Second and Foreign Language (SL/FL) Teaching
TEAL 5209 [0.5]	Teaching English as a Foreign Language: Methodology for Global Contexts
TEAL 5216 [0.5]	Fundamentals of TEAL
TEAL 5302 [0.5]	Second Language Acquisition and Learning Theories
TEAL 5305 [0.5]	Teaching English Language: Methodology I
<b>2. 1.0 credit from:</b>	<b>1.0</b>
TEAL 5202 [0.5]	Curriculum in Language Teaching
TEAL 5203 [0.5]	Issues in English Language Teaching/Teacher Education
TEAL 5208 [0.5]	Languages for Specific Purposes (LSP)
TEAL 5501 [0.5]	Language Assessment Theory and Practice
TEAL 5705 [0.5]	Second Language Writing: Research and Theory
<b>3. 1.0 credit in:</b>	<b>1.0</b>
TEAL 5210 [1.0]	TEAL Capstone Project
<b>Total Credits</b>	<b>5.0</b>

## Admission

The normal minimum requirement for admission to the M.A. TEAL is a B.A. Honours degree or equivalent. A degree in a discipline involving the analysis of language or language learning is an asset. A minimum of B+ in related courses and B overall in their academic work, or a grade point average of 8.0 is required.

It is recommended that applicants have an elemental understanding of major concepts related to linguistics and/or language education and relevant professional experience. Applicants are asked to outline how they satisfy these requirements in their Statement of Intent as part of their application package. The statement should include, but not limited to: discussion of linguistics or applied linguistics courses they have taken and how they relate to the MA TEAL program; discussion of how the applicants have applied language acquisition theory to their language learning or language teaching experience; details of their professional experience and how the knowledge gained in the MA TEAL program can be applied in this context.

For admission into MA TEAL program, applicants will need to demonstrate that their knowledge and use

of English are strong enough for graduate studies at an English-language university. Details of the English language requirements for the program can be found here: <https://graduate.carleton.ca/international/english-second-language/>

For other admission regulations not specific to the School of Linguistics and Language Studies, refer to the General Regulations section of the Graduate Calendar, in particular the subsection on Admission Requirements and Eligibility.

## Regulations

See the General Regulations section of this Calendar.

## Teaching of English as an Additional Language (TEAL) Courses

### TEAL 5202 [0.5 credit]

#### Curriculum in Language Teaching

Current theory and practice in language curriculum development and evaluation in the light of recent research in linguistics, sociolinguistics, language acquisition and language education policy.

Includes: Experiential Learning Activity

Also listed as ALDS 5202.

Prerequisite(s): enrolment in the MA TEAL program.

### TEAL 5203 [0.5 credit]

#### Issues in English Language Teaching/Teacher Education

A research seminar to explore current issues in English language teaching/teacher education.

Also listed as ALDS 5203.

Prerequisite(s): enrolment in the MA TEAL program.

### TEAL 5206 [0.5 credit]

#### Introduction to TEAL Theory

Major trends in TEAL theory and practice, current understandings of different aspects of language instruction and debatable issues in TEAL research. Introduction to critical reading of TEAL research; synthesis and presentation of research findings.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the MA TEAL program.

### TEAL 5207 [0.5 credit]

#### Pedagogical Grammar in Second and Foreign Language (SL/FL) Teaching

The concept of pedagogical grammar in SL/FL teaching. Critical examination of recent theories of 'focus on form' in communicative language classrooms, and related empirical work.

Includes: Experiential Learning Activity

Also listed as ALDS 5207.

Prerequisite(s): enrolment in the MA TEAL program.

**TEAL 5208 [0.5 credit]****Languages for Specific Purposes (LSP)**

Introduction to LSP, a sub-field of applied linguistics tailoring language instruction to specific groups of learners. Developments in strands of LSP (English for Science, Business, etc.). Research and teaching methodology. Emphasis on English for Academic Purposes/English for Specific Purposes research and instruction at Carleton.

Also listed as ALDS 5208.

Prerequisite(s): enrolment in the MA TEAL program.

**TEAL 5209 [0.5 credit]****Teaching English as a Foreign Language: Methodology for Global Contexts**

An introduction to the principles of teaching language in a foreign-language context; review of teaching approaches; practical examination, development and evaluation of instructional materials.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the MA TEAL program.

Also offered at the undergraduate level, with different requirements, as ALDS 4209., for which additional credit is precluded.

**TEAL 5210 [1.0 credit]****TEAL Capstone Project**

Processes of inquiry relevant to language education; design activities for curriculum, language instruction or assessment; synthesize and report outcomes clearly, convincingly, and creatively for a professional audience; reflect on previous coursework; explore and clarify future plans for careers as language teaching professionals.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the MA TEAL program.

**TEAL 5216 [0.5 credit]****Fundamentals of TEAL**

Fundamental principles and skills related to TEAL necessary for ethical and competent language teaching.

Topics include but are not limited to world Englishes, sociopolitical issues, and major structures of English.

Prerequisite(s): enrolment in the MA TEAL program.

**TEAL 5302 [0.5 credit]****Second Language Acquisition and Learning Theories**

Current social and cognitive theories of knowledge and learning and their application to the acquisition of first and additional languages; relation of theory to empirical studies of language learning in classroom and natural settings.

Includes: Experiential Learning Activity

Also listed as ALDS 5302.

Prerequisite(s): enrolment in the MA TEAL program.

**TEAL 5305 [0.5 credit]****Teaching English Language: Methodology I**

Classification of classroom teaching methods and materials; adaptation of teaching materials for particular situations; creation of teaching materials; teaching techniques and strategies.

Includes: Experiential Learning Activity

Prerequisite(s): enrolment in the MA TEAL program.

Also offered at the undergraduate level, with different requirements, as ALDS 4305, for which additional credit is precluded.

**TEAL 5501 [0.5 credit]****Language Assessment Theory and Practice**

Issues in language testing and classroom assessment, including validity theory and current validation research; challenges in test development; washback; models of alternative assessment.

Includes: Experiential Learning Activity

Also listed as ALDS 5501.

**TEAL 5705 [0.5 credit]****Second Language Writing: Research and Theory**

Second language writing: research, theory, and pedagogy.

Also listed as ALDS 5705.

# Technology Innovation Management

This section presents the requirements for programs in:

- **Master of Applied Business Analytics - Technology Innovation Management**
- **Master of Digital Transformation and Entrepreneurship - Technology Innovation Management**
- **M.Sc. Technology Innovation Management**
- **Master of Technology Technology Innovation Management**
- **Master of Entrepreneurship - Technology Innovation Management**
- **Master of Entrepreneurship - Technology Innovation Management with Collaborative Specialization in Accessibility**

## Program Requirements

### Master of Applied Business Analytics - Technology Innovation Management (5.5 credits)

#### Requirements – Project pathway:

1. 2.5 credits in:	2.5
TIMG 5001 [0.5]	Principles of Technology Innovation Management
TIMG 5002 [0.5]	Technology Entrepreneurship
TIMG 5003 [0.5]	Issues in Technology Innovation Management
TIMG 5301 [0.5]	Applied Analytics for Technology Innovation Management
TIMG 5303 [0.5]	Machine Learning for Technology Entrepreneurship Problem-Solving
2. 1.0 credit in approved TIMG elective	1.0
3. 1.0 credit in approved electives in engineering, business, or science	1.0
4. 1.0 credit in:	1.0
TIMG 5907 [1.0]	M.A.B.A. Project
<b>Total Credits</b>	<b>5.5</b>

### Master of Digital Transformation and Entrepreneurship - Technology Innovation Management (5.5 credits)

#### Requirements:

1. 2.5 credits in:	2.5
TIMG 5001 [0.5]	Principles of Technology Innovation Management
TIMG 5002 [0.5]	Technology Entrepreneurship
TIMG 5008 [0.5]	Foundations of Digital Transformation & Entrepreneurship
TIMG 5202 [0.5]	Moving Digital Transformation and Entrepreneurship Research into Business Practices
TIMG 5203 [0.5]	Cross Border Businesses and Digital Innovation
2. 1.0 credit in Technology Innovation Management electives	1.0
3. 1.0 credit in electives in Engineering, Business or Science, approved by the student's academic advisor	1.0
4. 1.0 credit in:	1.0

TIMG 5908 [1.0] Master of Digital Transformation & Entrepreneurship Project

or

1.0 credit in approved electives

**Total Credits** **5.5**

### M.Sc. Technology Innovation Management (5.5 credits)

#### Requirements - Thesis pathway (5.5 credits)

1. 1.5 credits in compulsory courses including:	1.5
TIMG 5001 [0.5]	Principles of Technology Innovation Management
TIMG 5002 [0.5]	Technology Entrepreneurship
TIMG 5003 [0.5]	Issues in Technology Innovation Management
2. 2.0 credits in approved restricted elective courses	2.0
3. 2.0 credits in:	2.0
TIMG 5909 [2.0]	Master's Thesis
<b>Total Credits</b>	<b>5.5</b>

#### Restricted Elective Courses

Students in the M.Sc. program must complete 1.0 credit in the field of technology innovation management and 1.0 credit in engineering, business or science. Courses in the field of technology innovation management begin with the prefix TIMG.

#### Non-Restricted Elective Courses

All students in the project option of the master's program are required to complete 1.0 credit from courses offered in engineering, business, or science.

### Master of Technology Technology Innovation Management (5.5 credits)

Students in the Master of Technology program are required to complete a total of 5.5 credits, of which at least 5.0 must be at the 5000-level or above, as follows:

#### Requirements - Project pathway (5.5 credits)

1. 1.5 credits in compulsory courses including:	1.5
TIMG 5001 [0.5]	Principles of Technology Innovation Management
TIMG 5002 [0.5]	Technology Entrepreneurship
TIMG 5003 [0.5]	Issues in Technology Innovation Management
2. 2.0 credits in approved restricted elective courses	2.0
3. 1.0 credit in approved non-restricted electives	1.0
4. 1.0 credit in a graduate project	1.0
<b>Total Credits</b>	<b>5.5</b>

#### Restricted Elective Courses

Students in the M.Tech. program must complete 1.0 credit in the field of technology innovation management and 1.0 credit in engineering, business or science. Courses in the field of technology innovation management begin with the prefix TIMG.

### Non-Restricted Elective Courses

Students in the M.Tech. program are required to complete 1.0 credit from courses offered in engineering, business, or science.

### Master of Entrepreneurship - Technology Innovation Management (5.5 credits)

Students in the Master of Entrepreneurship program are required to complete a total of 5.5 credits of which at least 5.0 must be at the 5000-level or above, as follows:

#### Requirements - Project pathway (5.5 credits)

<b>1. 2.5 credits in:</b>	<b>2.5</b>
TIMG 5001 [0.5] Principles of Technology Innovation Management	
TIMG 5002 [0.5] Technology Entrepreneurship	
TIMG 5008 [0.5] Foundations of Digital Transformation & Entrepreneurship	
TIMG 5205 [0.5] Customer Value Creation in Technology Firms	
TIMG 5201 [0.5] Technology and Wealth	
<b>2. 2.0 credits in approved restricted electives courses:</b>	<b>2.0</b>
1.0 credit in TIMG, and	
1.0 credit in engineering, business or science.	
<b>3. 1.0 credit in:</b>	<b>1.0</b>
TIMG 5905 [1.0] M.Ent. Project	
or	
1.0 credit in approved electives	
<b>Total Credits</b>	<b>5.5</b>

### Master of Entrepreneurship - Technology Innovation Management with Collaborative Specialization in Accessibility (5.5 credits)

Students in the Master of Entrepreneurship program are required to complete a total of 5.5 credits of which at least 5.0 must be at the 5000-level or above, as follows:

#### Requirements - Project pathway (5.5 credits)

<b>1. 2.5 credits in:</b>	<b>2.5</b>
TIMG 5001 [0.5] Principles of Technology Innovation Management	
TIMG 5002 [0.5] Technology Entrepreneurship	
TIMG 5008 [0.5] Foundations of Digital Transformation & Entrepreneurship	
TIMG 5205 [0.5] Customer Value Creation in Technology Firms	
TIMG 5201 [0.5] Technology and Wealth	
<b>2. 1.0 credit in approved restricted electives in TIMG</b>	<b>1.0</b>
<b>3. 1.0 credit in:</b>	<b>1.0</b>
ACCS 5001 [0.5] Critical Disability Studies	
ACCS 5002 [0.5] Accessibility and Inclusive Design Seminar	
<b>4. 1.0 credit in:</b>	<b>1.0</b>
TIMG 5905 [1.0] M.Ent. Project (in the specialization)	
<b>Total Credits</b>	<b>5.5</b>

### Admission

The normal requirement for admission to the master's program is a bachelor's degree in engineering, business, or science, with at least high honours standing.

Candidates are normally required to have two years of technical experience prior to admission.

Candidates applying for admission with degrees in other areas will be considered by the admissions committee. The committee is responsible for establishing criteria for degree equivalencies.

### Regulations

See the General Regulations section of this Calendar.

### Regularly Scheduled Break

For immigration purposes, the summer term (May to August) for the following programs is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.

- Master of Applied Business Analytics - Technology Innovation Management
- [M.A.Sc. Technology Innovation Management](#)
- [Master of Digital Transformation and Entrepreneurship - Technology Innovation Management](#)
- [M.Eng. Technology Innovation Management](#)
- Master of Entrepreneurship - Technology Innovation Management
- M.Sc. Technology Innovation Management

**Note:** a Regularly Scheduled Break as described for immigration purposes does not supersede the requirement for continuous registration in Thesis, Research Essay, or Independent Research Project as described in Section 8.2 of the Graduate General Regulations.

### Technology Innovation Management (TIMG) Courses

#### TIMG 5001 [0.5 credit]

##### Principles of Technology Innovation Management

Develops a common level of knowledge among students on topics in product and service development, technology entrepreneurship, and commercialization. These topics build on the literature in the fields of project management, leadership, industrial marketing, managerial economics and organizational behaviour.

#### TIMG 5002 [0.5 credit]

##### Technology Entrepreneurship

Key theories and models of technology entrepreneurship. Topics include the nature of technology products, collaborative experimentation and production of new products, assets, and their attributes, and the firm's asset ownership rights.

**TIMG 5003 [0.5 credit]****Issues in Technology Innovation Management**

Key readings relevant to technology innovation management. Topics include the introduction of new products to the global market, technology sourcing, intellectual property rights, industry trends, technology and ethics, new business opportunities and product identification, industry characteristics, regulation, international competition, ecosystems, economic development, and open source.

**TIMG 5004 [0.5 credit]****Research Methods in Technology Innovation Management**

Prepares students to undertake research in technology innovation management. Students learn to define interesting research problems and hypotheses relevant to technology innovation management, and learn the different research approaches used in the field of technology innovation management.

Prerequisite(s): TIMG 5001 and one of TIMG 5002 or TIMG 5003.

**TIMG 5006 [0.5 credit]****Management of Software Engineering Projects**

Models for the development of software. Software project management tools. Quality control. Risk assessment and management. Examples are drawn from the development of new technology products.

Includes: Experiential Learning Activity

Prerequisite(s): TIMG 5001 and TIMG 5002.

**TIMG 5008 [0.5 credit]****Foundations of Digital Transformation & Entrepreneurship**

Antecedents, patterns, and consequences of agile digital business transformation, digital business development, digital business model innovation, disruptive digital technology, digital entrepreneurship, marketing and sales for a digital age. Managing digital business transformation and development of new digital value propositions in new and existing companies.

Includes: Experiential Learning Activity

Prerequisite(s): TIMG 5001 and TIMG 5002.

**TIMG 5101 [0.5 credit]****Integrated Product Development**

The new product introduction process and time-based competition, basic concepts of integrated product development, parallelism and concurrency of development activities, flexibility and agility, the voice of the customer, cross-functional teams, organizing for innovation, collaboration across firm boundaries, manufacturing and design.

Prerequisite(s): TIMG 5001 and TIMG 5002.

**TIMG 5103 [0.5 credit]****Advanced Topics in Technology Innovation Management**

In-depth exploration of an advanced topic in the field of technology innovation management. A different topic is covered each semester and more than one section, with different topics, may be offered in the same semester.

Prerequisite(s): one of TIMG 5004, TIMG 5005, or TIMG 5101.

**TIMG 5104 [0.5 credit]****Directed Studies in Technology Innovation Management**

The student explores, through extensive literature surveys, specific topics in the areas of technology innovation management. The objective is to enable study on a specific topic to acquire a suitable background to initiate and complete thesis work.

**TIMG 5105 [0.5 credit]****Designing Innovation Communities**

This course helps entrepreneurs and product managers understand the role of communities in innovation (eg. peer production and crowdsourcing). It provides them with tools for designing communities, and guidelines for selecting the technology for supporting a community.

**TIMG 5106 [0.5 credit]****Open Source Business**

The management of open source businesses. Topics may include company participation in open source projects, capturing value from open source projects, creating and managing open source ecosystems, open-source development, role of architecture in open source projects.

**TIMG 5107 [0.5 credit]****Co-creating Inclusive Innovation**

Students apply research in technology innovation management to co-create innovative solutions that reduce inequalities caused by social, political, and economic exclusion and have local context at their core. TIM students may collaborate with Indigenous communities, other organizations, and students in science, engineering, and other areas.

Includes: Experiential Learning Activity

Prerequisite(s): TIMG 5001 and one of TIMG 5002 or TIMG 5003.

**TIMG 5110 [0.5 credit]****Project-based Learning**

Provides an environment where TIM students in their second or third term can develop TIM Project proposals. The client may be a company (large or small), an entrepreneur, a not-for-profit, or a Carleton group. Projects will follow the TIM Gate process for student research.

**TIMG 5201 [0.5 credit]****Technology and Wealth**

Tools, models, approaches, theories and frameworks used to deploy technology to create and appropriate wealth.

**TIMG 5202 [0.5 credit]****Moving Digital Transformation and Entrepreneurship Research into Business Practices**

Tools, models, approaches, theories, and frameworks used to deploy digital technology to frame, create, appropriate, distribute, protect, sustain, convey, and deliver value. Streamlines the movement of research findings in digital transformation, business model innovation, and technology entrepreneurship into business practices.

Includes: Experiential Learning Activity

Prerequisite(s): TIMG 5008.

**TIMG 5203 [0.5 credit]****Cross Border Businesses and Digital Innovation**

Examines the mechanisms that leverage digital technology and innovation to scale the value of entrepreneurial cross-border businesses rapidly, early, and securely.

Includes: Experiential Learning Activity

Prerequisite(s): TIMG 5008.

**TIMG 5204 [0.5 credit]****Responsible Artificial Intelligence**

Ethical aspects of development/adoption of Artificial Intelligence (AI) and digital technologies in business practice. Responsible AI business opportunities in cross-border businesses. Responsible AI governance frameworks. AI inclusiveness, bias, fairness, transparency, explainability, accountability, data re-use, protection, and privacy. Assessment of trustworthy AI systems.

Includes: Experiential Learning Activity

Precludes additional credit for TIMG 5103.

Prerequisite(s): TIMG 5002 or TIMG 5008.

**TIMG 5205 [0.5 credit]****Customer Value Creation in Technology Firms**

Company value architecture and value propositions, design thinking and multiple stakeholder perspectives on value, new product and service design, digital value creation, technology and complementary assets, latent needs, co-design and user innovation, alignment of technology and business strategy, user experience, customer retention.

Includes: Experiential Learning Activity

Precludes additional credit for TIMG 5005 (no longer offered).

Prerequisite(s): TIMG 5002.

**TIMG 5301 [0.5 credit]****Applied Analytics for Technology Innovation Management**

Application of advanced business analytics in the domain of technology innovation management and technology entrepreneurship. Topics include supervised and unsupervised machine learning, anticipatory thinking, and anomaly detection, to inform managerial judgement and support strategic and operating decisions faced by managers and entrepreneurs.

Includes: Experiential Learning Activity

Prerequisite(s): TIMG 5001.

**TIMG 5303 [0.5 credit]****Machine Learning for Technology Entrepreneurship Problem-Solving**

Application of machine learning tools to co-create solutions to entrepreneurial problems, with an emphasis on unstructured text analytics. Topics include machine learning tools, application of topic modeling and text analytics, generation of practical competitive insights for managers, and analysis of publicly-available sources including websites.

Includes: Experiential Learning Activity

Prerequisite(s): TIMG 5002.

**TIMG 5901 [1.0 credit]****M.Eng. Project**

Includes: Experiential Learning Activity

**TIMG 5905 [1.0 credit]****M.Ent. Project**

Includes: Experiential Learning Activity

**TIMG 5907 [1.0 credit]****M.A.B.A. Project**

Master of Applied Business Analytics Project.

Includes: Experiential Learning Activity

**TIMG 5908 [1.0 credit]****Master of Digital Transformation & Entrepreneurship Project**

Final TIM Master of Digital Transformation & Entrepreneurship Project.

Includes: Experiential Learning Activity

**TIMG 5909 [2.0 credits]****Master's Thesis**

Includes: Experiential Learning Activity

## Women's and Gender Studies

This section presents the requirements for programs in:

- **M.A. Women's and Gender Studies**
- **M.A. Women's and Gender Studies with Collaborative Specialization in Accessibility**
- **M.A. Women's and Gender Studies with Collaborative Specialization in African Studies**
- **M.A. Women's and Gender Studies with Collaborative Specialization in Latin American and Caribbean Studies**

### Program Requirements

#### M.A. Women's and Gender Studies (5.0 credits)

##### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
WGST 5900 [0.5]	Program Seminar
<b>2. 0.5 credit in:</b>	0.5
WGST 5906 [0.5]	Feminist Theory
<b>3. 0.5 credit in:</b>	0.5
WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>4. 1.5 credits in</b> additional course work chosen from available elective courses (see below)	1.5
<b>5. 2.0 credits in:</b>	2.0
WGST 5909 [2.0]	M.A. Thesis
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Research essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
WGST 5900 [0.5]	Program Seminar
<b>2. 0.5 credit in:</b>	0.5
WGST 5906 [0.5]	Feminist Theory
<b>3. 0.5 credit in:</b>	0.5
WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>4. 2.5 credits in</b> additional course work chosen from available elective courses (see below)	2.5
<b>5. 1.0 credit in:</b>	1.0
WGST 5908 [1.0]	Research Essay
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Coursework pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
WGST 5900 [0.5]	Program Seminar
<b>2. 0.5 credit in:</b>	0.5
WGST 5906 [0.5]	Feminist Theory
<b>3. 0.5 credit in:</b>	0.5
WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>4. 3.5 credits in</b> additional course work chosen from available elective courses (see below)	3.5
<b>Total Credits</b>	<b>5.0</b>

#### M.A. Women's and Gender Studies with Collaborative Specialization in Accessibility (5.0 credits)

##### Requirements - Thesis pathway (5.0 credits):

<b>1. 1.0 credit in:</b>	1.0
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 0.5 credit in:</b>	0.5
WGST 5900 [0.5]	Program Seminar
<b>3. 0.5 credit in:</b>	0.5
WGST 5906 [0.5]	Feminist Theory
<b>4. 0.5 credit in:</b>	0.5
WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>5. 0.5 credit in</b> additional course work chosen from available elective courses.	0.5
<b>6. 2.0 credits in:</b>	2.0
WGST 5909 [2.0]	M.A. Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Research essay pathway (5.0 credits):

<b>1. 1.0 credit in:</b>	1.0
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>2. 0.5 credit in:</b>	0.5
WGST 5900 [0.5]	Program Seminar
<b>3. 0.5 credit in:</b>	0.5
WGST 5906 [0.5]	Feminist Theory
<b>4. 0.5 credit in:</b>	0.5
WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>5. 1.5 credits in</b> additional course work chosen from available elective courses (see below)	1.5
<b>6. 1.0 credit in:</b>	1.0
WGST 5908 [1.0]	Research Essay (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

##### Requirements - Coursework Pathway (5.0 credits):

<b>1. 1.5 credits in:</b>	1.5
WGST 5900 [0.5]	Program Seminar
WGST 5906 [0.5]	Feminist Theory
WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>2. 1.0 credit in:</b>	1.0
ACCS 5001 [0.5]	Critical Disability Studies
ACCS 5002 [0.5]	Accessibility and Inclusive Design Seminar
<b>3. 0.5 credit in</b> a course designated as having sufficient accessibility content and approved by the Women's and Gender Studies graduate advisor.	0.5
<b>4. 2.0 credits in</b> Women's and Gender Studies courses or approved electives. With Institute permission 0.5 credit may be selected from courses at the 4000-level.	2.0
<b>Total Credits</b>	<b>5.0</b>

## M.A. Women's and Gender Studies with Collaborative Specialization in African Studies (5.0 credits)

### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 0.5 credit in:</b>	0.5
WGST 5900 [0.5]	Program Seminar
<b>4. 0.5 credit in:</b>	0.5
WGST 5906 [0.5]	Feminist Theory
<b>5. 0.5 credit in:</b>	0.5
WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>6. 1.0 credit in</b>	1.0
additional course work chosen from available elective courses (see below)	
<b>7. 2.0 credits in:</b>	2.0
WGST 5909 [2.0]	M.A. Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

### Requirements - Research essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
<b>2. 0.0 credit in:</b>	0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
<b>3. 0.5 credit in:</b>	0.5
WGST 5900 [0.5]	Program Seminar
<b>4. 0.5 credit in:</b>	0.5
WGST 5906 [0.5]	Feminist Theory
<b>5. 0.5 credit in:</b>	0.5
WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>6. 2.0 credits in</b>	2.0
additional course work chosen from available elective courses (see below)	
<b>7. 1.0 credit in:</b>	1.0
WGST 5908 [1.0]	Research Essay (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

## M.A. Women's and Gender Studies with Collaborative Specialization in Latin American and Caribbean Studies (5.0 credits)

### Requirements - Thesis pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 0.5 credit in:</b>	0.5
WGST 5900 [0.5]	Program Seminar
<b>4. 1.0 credit in:</b>	1.0
WGST 5906 [0.5]	Feminist Theory

WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>5. 1.0 credits in</b>	1.0
<b>6. 2.0 credits in:</b>	2.0
WGST 5909 [2.0]	M.A. Thesis (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

### Requirements - Research essay pathway (5.0 credits)

<b>1. 0.5 credit in:</b>	0.5
LACS 5000 [0.5]	Interdisciplinary Approaches to Latin American and Caribbean Studies
<b>2. 0.0 credit in:</b>	0.0
LACS 5800 [0.0]	Scholarly Preparation in Latin American and Caribbean Studies
<b>3. 0.5 credit in:</b>	0.5
WGST 5900 [0.5]	Program Seminar
<b>4. 1.0 credit in:</b>	1.0
WGST 5906 [0.5]	Feminist Theory
WGST 5907 [0.5]	Researching Women's and Gender Issues
<b>5. 2.0 credits in</b>	2.0
<b>7. 1.0 credit in:</b>	1.0
WGST 5908 [1.0]	Research Essay (in the specialization)
<b>Total Credits</b>	<b>5.0</b>

## Elective Courses

Electives may be taken from a selection of courses offered outside the program in a related discipline, subject to the approval of the Graduate Supervisor.

Elective courses may include but are not limited to:

ANTH 5704 [0.5]	Anthropology of the Body, Health, Illness and Healing
COMS 5509 [0.5]	Gender, Sexuality, Culture
HIST 5803 [0.5]	History of Women, Gender and Sexuality: Foundations
INAF 5609 [0.5]	Development Project Evaluation and Analysis
LAWS 5302 [0.5]	Feminism, Law and Social Transformation
LAWS 6003 [0.5]	Human Rights, Citizenship and Global Justice
PADM 5213 [0.5]	Gender and Public Policy
PHIL 5304 [0.5]	Tutorial in Selected Problems of Philosophy I
PHIL 5350 [0.5]	Topics in Ethics or Political Philosophy
PHIL 5500 [0.5]	Topics in Contemporary Philosophy
PSCI 5200 [0.5]	Nationalism
PSCI 5202 [0.5]	Development Theory and Issues
PSCI 5208 [0.5]	Global Social Policy
PSCI 5209 [0.5]	Forced Migration and Global Politics
PSCI 5210 [0.5]	Politics and Popular Culture
PSCI 5407 [0.5]	Reproductive Rights Policy in North America
PSCI 5506 [0.5]	Gender and Politics
PSCI 5607 [0.5]	Politics of North America
PSCI 6301 [0.5]	Political Theory II

PSYC 5001 [0.5]	Qualitative Research Methods in Psychology
SOCI 5308 [0.5]	Decolonizing Feminist Analyses
SOCI 5404 [0.5]	Race, Ethnicity and Class in Contemporary Societies
SOCI 5409 [0.5]	The Politics of Social Movements and the State
SOCI 5809 [0.5]	The Logic of the Research Process
WGST 5000 [0.5]	Issues for Feminist Scholarship
WGST 5001 [0.5]	Research Seminar in Women's and Gender Studies
WGST 5901 [0.5]	Advanced Topics in Women's and Gender Studies I
WGST 5902 [0.5]	Advanced Topics in Women's and Gender Studies II
WGST 5910 [0.5]	Directed Studies
WGST 5911 [0.5]	Directed Studies
WGST 5920 [1.0]	Internship in Women's and Gender Studies

### Progress through the program

The first year of study is essentially the same for all full-time students entering the program regardless of whether their intention is to pursue the Thesis, Research Essay or Course work option (the schedule for program completion for part-time students is in consultation with the unit). All full-time students will be expected to complete the core feminist theory and methodologies courses in the first year.

At the end of the winter term of the first year of study, and in consultation with the Graduate Supervisor, full-time students will be required to declare their intention to pursue the Thesis, Research Essay, or Course work option. The deadline for this decision will normally be in writing on or before April 1st.

### Thesis option

At the end of the winter term of the first year of study, all full-time students will be expected to submit a research proposal that has been approved by their Thesis supervisor. The deadline for submitting the proposal is April 28.

### Research Essay option

At the end of the winter term of the first year of study, all full-time students will be expected to submit a research proposal that has been approved by their Research Essay supervisor. The deadline for submitting the proposal is April 28. Students pursuing the Research Essay option will also be required to complete two additional half-course electives. Typically, these courses will be completed in the fall term of the second year.

### Coursework option

Students pursuing the coursework option will be required to complete four additional half-course electives. Typically, these courses will be completed over the fall and winter terms of the second year.

### Regulations

See the General Regulations section of this Calendar.

Academic standing of B- or higher must be obtained in each course counted towards the fulfillment of the degree requirements. Candidates must also maintain a CGPA of 9.0 or higher and achieve Satisfactory or better on the M.A. thesis and its oral defence.

### Admission

The minimum requirement for admission to the MA program in Women's and Gender Studies is a BA Honours degree in Women's and Gender Studies or related areas with high honours standing. Students who have completed a degree with a significant focus on gender and gender-related coursework from disciplines including Sociology, History, English, Philosophy, Anthropology, Canadian Studies and Political Science, for example, will be considered for admission to the program. Applicants without the requisite background may be required to take a maximum of 2.0 credits from designated courses at the undergraduate level in Women's and Gender Studies in addition to their normal MA program requirements.

### Qualifying Year Program

Applicants without a B.A. Honours degree in Women's and Gender Studies but who have a three year degree with a Women's and Gender Studies major, minor or a degree in a related discipline with a minimum average of B+ will be required to complete successfully a qualifying year of full-time study, before proceeding to apply to the Master's program. At this time, the Institute will determine the student's eligibility to enter the program.

### Accelerated Pathway

The accelerated pathway in Women's and Gender Studies is a flexible and individualized plan of graduate study for students in their final year of a Carleton B.A. Honours degree in Women and Gender Studies.

Students in their third-year of study in the B.A Honours degree in Women's and Gender Studies should consult with both the Undergraduate Advisor and the Graduate Advisor determine if the accelerated pathway is appropriate for them and to confirm their selection of courses and Honours project supervisor for their final year of undergraduate studies.

### Accelerated Pathway Requirements

1. Two courses at the 5000-level with a grade of B+ or higher.
2. Minimal overall CGPA of B+

Students may receive advanced standing with transfer of credit of up to 1.0 credit which can reduce their time to completion.

### Women's and Gender Studies (WGST) Courses

#### WGST 5000 [0.5 credit]

#### Issues for Feminist Scholarship

Selected issues based on the research expertise of the Instructor, designed to provide students with a broad introduction to the diversity of women's experiences within that issue. Critical issues related to race, class, gender and ability.

**WGST 5001 [0.5 credit]****Research Seminar in Women's and Gender Studies**

An examination of the Instructor's research focus (topics will vary from year-to-year) with respect to issues of feminist methodologies and epistemology related to developing and conducting feminist or women-centred research. The focus is interdisciplinary.

**WGST 5003 [0.5 credit]****Traversing Feminisms**

Interdisciplinary overview of key historical concepts in Women's and Gender Studies in the areas of theory, epistemology, and research design. Topics will vary from year to year. The course provides additional background for students entering Women's and Gender Studies from other disciplines.

Prerequisite(s): permission of the Institute.

Also offered at the undergraduate level, with different requirements, as WGST 4003, for which additional credit is precluded.

**WGST 5060 [0.5 credit]****African Feminisms**

African feminisms as theoretical interventions and as political practice, and as diverse forms. Gender as a marker of power: status, hierarchy, social capability, and as a system of distribution of resources, responsibilities and solidarities.

Includes: Experiential Learning Activity

Also listed as AFRI 5060.

Also offered at the undergraduate level, with different requirements, as WGST 4060, for which additional credit is precluded.

**WGST 5102 [0.5 credit]****Queer Theory**

A critical approach to gender and sexuality by engaging in key debates and texts in the field of queer theory and studies.

Includes: Experiential Learning Activity

Prerequisite(s): Graduate student standing and permission of the institute.

Also offered at the undergraduate level, with different requirements, as SXST 4102, for which additional credit is precluded.

**WGST 5900 [0.5 credit]****Program Seminar**

MA candidates are required to take part in a seminar in which faculty members and students discuss new work in the field, analyze current issues in Women's and Gender Studies, and pursue topics of professional development. Students will prepare their thesis or research paper.

Includes: Experiential Learning Activity

Precludes additional credit for WGST 5905 (no longer offered).

Prerequisite(s): Permission of the Institute.

**WGST 5901 [0.5 credit]****Advanced Topics in Women's and Gender Studies I**

The applications of gender to different fields of knowledge, cultural expression, and institutional regulation. Gender will be interrogated as it intersects with race, class, ethnicity, age, ability and cross-cultural perspectives.

**WGST 5902 [0.5 credit]****Advanced Topics in Women's and Gender Studies II**

Selected topics may include: gender, power and social inequalities; women's writing; gender history; gender, sexuality and music embodiment; race, gender and imperialism; gender, criminology and criminal justice; queer theory; transnational feminisms.

**WGST 5906 [0.5 credit]****Feminist Theory**

An analysis of contemporary feminist theoretical debates that provides students with competence in the application of a range of theoretical models, and an appreciation of their specific historical contexts and development.

**WGST 5907 [0.5 credit]****Researching Women's and Gender Issues**

Consideration of a range of research methodologies and approaches relevant to women's and gender studies. In particular, students will examine the impact of gender studies on epistemological and methodological issues in a variety of academic disciplines.

**WGST 5908 [1.0 credit]****Research Essay**

An examination of an approved topic in an area of specialization of either the Institute faculty or associated faculty from across the University. Students will have a supervisor and a second reader.

Includes: Experiential Learning Activity

**WGST 5909 [2.0 credits]****M.A. Thesis**

A substantial investigation of a topic in Women's and Gender Studies that will be determined in consultation with the Institute. Students will have a primary supervisor selected from within the Institute or from associated Faculty across the University. The candidate will be examined orally.

Includes: Experiential Learning Activity

**WGST 5910 [0.5 credit]****Directed Studies**

Directed study on selected topics may be arranged with a faculty member or visiting scholar with the permission of the Institute. Students cannot accumulate more than 1.0 credit in directed studies towards their degree requirements.

**WGST 5911 [0.5 credit]****Directed Studies**

Directed study on selected topics may be arranged with a faculty member or visiting scholar with the permission of the Institute. Students cannot accumulate more than 1.0 credit in directed studies towards their degree requirements.

**WGST 5920 [1.0 credit]****Internship in Women's and Gender Studies**

Experience in applied feminisms through a combination of classroom seminars and internship. Each project will be negotiated individually as a contract between the student, instructor and institutional partner. Students must complete both the in-class and the internship portion of the course. Includes: Experiential Learning Activity  
Prerequisite(s): Enrollment in the M.A. Women's and Gender Studies program.

Also offered at the undergraduate level, with different requirements, as WGST 4801, for which additional credit is precluded.

## Work and Labour

This section presents the requirements for programs in:

- **M.A. Political Economy with Concentration in Work and Labour**
- **Graduate Diploma in Work and Labour**

**M.A. Political Economy with Concentration in Work and Labour (5.0 credits)****Requirements - Thesis pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy
PECO 5001 [0.5]	Methodologies of Political Economy
<b>2. 0.5 credit in:</b>	<b>0.5</b>
PECO 5002 [0.5]	Political Economy of Work and Labour
<b>3. 0.5 credit from:</b>	<b>0.5</b>
PECO 5503 [0.5]	Special Topics in Work and Labour I
PECO 5504 [0.5]	Special Topics in Work and Labour II
<b>4. 0.5 credit from:</b>	<b>0.5</b>
PECO 5904 [0.5]	Placement in Political Economy
PECO 5905 [0.5]	Reflective Practice in Work and Labour
<b>5. 0.5 credit in approved elective</b>	<b>0.5</b>
<b>6. 2.0 credits in:</b>	<b>2.0</b>
PECO 5909 [2.0]	M.A. Thesis (on a Work and Labour topic)
<b>Total Credits</b>	<b>5.0</b>

**Requirements - Research essay pathway (5.0 credits)**

<b>1. 1.0 credit in:</b>	<b>1.0</b>
PECO 5000 [0.5]	Theories of Political Economy
PECO 5001 [0.5]	Methodologies of Political Economy
<b>2. 0.5 credit in:</b>	<b>0.5</b>
PECO 5002 [0.5]	Political Economy of Work and Labour
<b>3. 0.5 credit from:</b>	<b>0.5</b>
PECO 5503 [0.5]	Special Topics in Work and Labour I
PECO 5504 [0.5]	Special Topics in Work and Labour II
<b>4. 0.5 credit from:</b>	<b>0.5</b>
PECO 5904 [0.5]	Placement in Political Economy
PECO 5905 [0.5]	Reflective Practice in Work and Labour
<b>5. 1.5 credits in approved electives</b>	<b>1.5</b>
<b>6. 1.0 credit in:</b>	<b>1.0</b>
PECO 5908 [1.0]	Research Essay
<b>Total Credits</b>	<b>5.0</b>

**Graduate Diploma in Work and Labour (2.5 credits)****Requirements (2.5 credits):**

<b>1. 0.5 credit in:</b>	<b>0.5</b>
PECO 5002 [0.5]	Political Economy of Work and Labour

<b>2. 0.5 credit from:</b>		<b>0.5</b>
PECO 5503 [0.5]	Special Topics in Work and Labour I	
PECO 5504 [0.5]	Special Topics in Work and Labour II	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
PECO 5904 [0.5]	Placement in Political Economy	
PECO 5905 [0.5]	Reflective Practice in Work and Labour	
<b>4. 1.0 credit in approved electives</b>		<b>1.0</b>
<b>Total Credits</b>		<b>2.5</b>

## Admission

### Type 2 Diploma

Applicants must be enrolled at Carleton University in a master's or doctoral program in a related discipline. Not available to students enrolled in the MA in Political Economy.

### Type 3 Diploma

Applicants must possess an honours bachelor or equivalent four-year undergraduate university degree in a social sciences, humanities, or disciplinary program relevant to Work and Labour. Applicants without these qualifications may be considered for admission with a non-honours bachelor's degree and significant relevant work or volunteer experience in the area of labour issues.

## Political Economy (PECO) Courses

### PECO 5000 [0.5 credit]

#### Theories of Political Economy

Students analyze and synthesize the core concepts and ideas proposed by both the founders and modern practitioners of political economy. The course focuses on theories of power relations and inequalities and assesses the consequences of these theories.

### PECO 5001 [0.5 credit]

#### Methodologies of Political Economy

Students conceptualize, design, and conduct an interdisciplinary research project in political economy, using an appropriate methodological approach. Methodological alternatives are compared.

### PECO 5002 [0.5 credit]

#### Political Economy of Work and Labour

Students analyze and synthesize key concepts and debates in the political economy of work and labour, with particular attention to divisions of labour, power structures, and histories of struggle.

### PECO 5501 [0.5 credit]

#### Special Topics in Political Economy I

Topic varies from year to year. Students should check with the Institute regarding the topic offered. Also listed as SOCI 5504, PSCI 5501.

### PECO 5502 [0.5 credit]

#### Special Topics in Political Economy II

Topic varies from year to year. Students should check with the Institute regarding the topic offered. Also listed as SOCI 5505, PSCI 5502.

### PECO 5503 [0.5 credit]

#### Special Topics in Work and Labour I

Topics and emphasis vary from term to term according to current policies and events influencing the distribution and benefits of work and labour including migration, technological and environmental change, privatization, austerity, and transnational legislation. Also listed as PSCI 5504, SOCI 5503.

### PECO 5504 [0.5 credit]

#### Special Topics in Work and Labour II

Topics and emphasis vary from term to term according to current policies and events influencing the distribution and benefits of work and labour including migration, technological and environmental change, privatization, austerity, and transnational legislation. Also listed as PSCI 5505, SOCI 5502.

### PECO 5505 [0.5 credit]

#### Special Topics in Political Economy III

Topic varies from year to year. Students should check with the Institute regarding the topic offered.

### PECO 5506 [0.5 credit]

#### Special Topics in Political Economy IV

Topic varies from year to year. Students should check with the Institute regarding the topic offered.

### PECO 5900 [0.5 credit]

#### Tutorial in Political Economy

Directed readings on selected aspects of political economy, involving preparation of papers as the basis for discussion with the tutor. Offered when no regular course offering meets a candidate's specific needs. Prerequisite(s): permission of the Director.

**PECO 5904 [0.5 credit]****Placement in Political Economy**

Course participants earn credit by contributing to organizations engaged in research, policy, and advocacy activities related to IPE. Students will have opportunities to participate in and contribute to the mission of their placement organizations, develop professional skills, and reflect on career goals.

Includes: Experiential Learning Activity

Precludes additional credit for PECO 5907 (no longer offered).

Prerequisite(s): permission of the Institute. Completion of PECO 5002 and completion or concurrent registration in PECO 5503/5504 for Work and Labour students. For all other IPE students, completion of PECO 5000 and at least one elective.

**PECO 5905 [0.5 credit]****Reflective Practice in Work and Labour**

This course is designed for students already engaged as staff or active volunteers in unions or other work- and labour-focused community organizations. Written work and discussion offers a space to reflect on questions of strategy, organization, and analysis relevant to their organization's mission.

Includes: Experiential Learning Activity

Precludes additional credit for PECO 5906 (no longer offered).

Prerequisite(s): PECO 5002 and completion of or concurrent registration in PECO 5503 or 5504 and permission of the Institute.  
unscheduled

**PECO 5908 [1.0 credit]****Research Essay**

Directly linked to the student's course work, the research essay must be interdisciplinary in approach.

Includes: Experiential Learning Activity

**PECO 5909 [2.0 credits]****M.A. Thesis**

The thesis is an alternative to the research essay. It must also be interdisciplinary in approach, and requires greater substance and originality than the Research Essay.

Normally, a student's thesis committee will be composed of members from more than one discipline.

Includes: Experiential Learning Activity

**PECO 6000 [0.5 credit]****Political Economy: Core Concepts**

Students analyze and synthesize the historical evolution of, and contemporary debates in, political economy through interdisciplinary dialogue. Students develop knowledge of political economy theories compatible with their own research interests.

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