

# **Academic Calendar**

## **2021/2022**

Graduate Studies

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# Calendar 2021/2022

## Important Notices

Students are advised that the matters dealt with in this Calendar are subject to continuing review and revision. The content of this calendar is subject to change without notice, other than through the regular processes of Dalhousie University, and every student accepted for registration in the University shall be deemed to have agreed to any such deletion, revision or addition whether made before or after said acceptance. Additionally, students are advised that this calendar is not an all-inclusive set of rules and regulations but represents only a portion of the rules and regulations that will govern the student's relationship with the University. Other rules and regulations are contained in additional publications that are available to the student from the Registrar's Office, and/or the relevant faculty, department, or school.

Dalhousie University does not accept any responsibility for loss or damage suffered or incurred by any student as a result of suspension or termination of services, courses or courses caused by reason of strikes, lockouts, riots, weather, damage to university property or for any other cause beyond the reasonable control of Dalhousie University.

Inquiries should be directed to:

The Registrar  
Dalhousie University  
PO Box 15000  
Halifax, Nova Scotia  
Canada B3H 4R2  
Telephone: (902) 494-2450  
Fax: (902) 494-1630  
Email: [Registrar@dal.ca](mailto:Registrar@dal.ca)

## Other Programs

Information on programs offered by the Faculties of Architecture and Planning, Arts and Social Sciences, Computer Science, Engineering, Health, Management, and Science can be found in the [Undergraduate Calendar](#). Information on programs offered by the Faculties of Dentistry, Law, and Medicine can be found in the [Dentistry, Law, Medicine Calendar](#). Information on Graduate programs can be found in the [Graduate Studies Calendar](#).

Accurate as of March 2, 2021

## Graduate Calendar

### Faculty of Graduate Studies

## Academic Dates 2021/2022

[Drop Dates for Courses without Part of Term](#)

**ACADEMIC CLASS ADD/DROP DATES** (For financial deadlines and refund dates, visit [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca).)

Term Identifier	Part of Term Description	Duration of Classes	Last Day to Change and Add Classes for registered students	Last Day to Drop without "W"	Last Day to Drop with "W"
				Last Day to Change from Audit to Credit and Vice Versa	

### Summer Term 2021

1 (UG), 2 (GR) 9	Full Term  12-week Term	May 3 - July 26, 2021 June 3 - August 27, 2021	May 14, 2021 June 16, 2021	May 31, 2021 June 30, 2021	June 28, 2021 July 29, 2021
A	7-week Term	May 10 - June 28, 2021	May 17, 2021	May 25, 2021	June 10, 2021
D	3-week Term	May 10 - June 1, 2021	May 12, 2021	May 14, 2021	May 21, 2021
E	3-week Term	June 3 - June 24, 2021	June 7, 2021	June 9, 2021	June 16, 2021
B	7-week Term	July 5 - August 23, 2021	July 12, 2021	July 20, 2021	August 5, 2021
F	3-week Term	July 5 - July 26, 2021	July 7, 2021	July 9, 2021	July 16, 2021
G	3-week Term	July 28 - August 19, 2021	July 30, 2021	August 3, 2021	August 10, 2021
<b>Fall Term 2021</b>					
Multi-Term Courses	Full Year Class	September 7, 2021 - April 6, 2022	September 17, 2021	November 1, 2021	January 31, 2022
1 (UG), 2 (GR)	Full Term	September 7, 2021 - December 7, 2021	September 17, 2021	October 1, 2021	November 1, 2021
<b>Winter Term 2022</b>					
1 (UG), 2 (GR)	Full Term	January 5, 2022 - April 6, 2022	January 14, 2022	January 28, 2022	March 7, 2022
<b>Summer Term 2022</b>					
1 (UG), 2 (GR) 9	Full Term  12-week Term	May 2, 2022 - July 26, 2022 June 2, 2022 - August 26, 2022	May 16, 2022 June 16, 2021	May 31, 2022 June 30, 2022	June 28, 2022 July 29, 2022
A	7-week Term	May 9, 2022 - June 27, 2022	May 17, 2022	May 26, 2022	June 13, 2022
D	3-week Term	May 9, 2022 - May 31, 2022	May 12, 2022	May 16, 2022	May 24, 2022
E	3-week Term	June 2, 2022 - June 23, 2022	June 7, 2022	June 9, 2022	June 16, 2022

B	7-week Term	July 4, 2022 - August 22, 2022	July 12, 2022	July 20, 2022	August 8, 2022
F	3-week Term	July 4, 2022 - July 25, 2022	July 7, 2022	July 11, 2022	July 18, 2022
G	3-week Term	July 27, 2022 - August 18, 2022	August 2, 2022	August 4, 2022	August 11, 2022

## Other Academic Dates 2021

### *May*

Monday, 24	Victoria Day - University closed
Wednesday, 20	Convocation (Faculty of Agriculture)
Thursday, 21 - Wednesday, 27	Spring Convocations

### *July*

Thursday, 1	Canada Day - University closed Last day to apply to graduate in October without paying a fee
-------------	-------------------------------------------------------------------------------------------------

### *August*

Monday, 2	Halifax/Dartmouth Natal Day - University closed
Tuesday, 31	Last day for those expecting to receive graduate degrees in October to make <a href="#">electronic submission</a> of approved thesis to FGS  Last day to have Leave of Absence or change of student status approved by Graduate Studies for Fall term

### *September*

Monday, 6	Labour Day - University closed
Tuesday, 7	Classes begin, fall term

### *October*

Monday, 11	Thanksgiving Day - University closed
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### *November*

Thursday, 11	Remembrance Day - University closed
Monday, 8 - Friday, 12	Fall Study Week (except students in Co-op Clinicals, or Internships)

### *December*

Wednesday, 1	Last day to apply to graduate in May without paying the late fee
Tuesday, 7	Classes end, fall term <b>Tuesday, December 7, 2021 - Monday classes will be held</b>
Thursday, 9	Examinations begin
Sunday, 19	Examinations end
Friday, 17	Last day to make <a href="#">electronic submission</a> of approved thesis to FGS for those convocating in May without registering for Winter term



	Last day to have Leave of Absence or change in student status approved for Winter term
Wednesday, 29	Grades due for courses with formal exams

## 2022

### *January*

Monday, 3	University closed in lieu of New Years Day holiday
Tuesday, 4	University reopens
Wednesday, 5	Classes begin, winter term

### *February*

Friday, 4	Munro Day - University closed
Monday, 21 - Friday, 25	Winter Study Break
Monday, 21	Nova Scotia Heritage Day - University closed

### *April*

Wednesday, 6	Classes end, regular session <b>Wednesday, April 6, 2022 - Friday classes will be held</b>
Friday, 8	Examinations begin
Thursday, 14	Last day to make <a href="#">electronic submission</a> of approved thesis to FGS for those convocating in May
Friday, 15	Good Friday - University closed
Tuesday, 26	Examinations end
Friday, 29	Last day to make <a href="#">electronic submission</a> of approved thesis to FGS for those convocating in October without registering for Summer term Last day to have Leave of Absence or change in student status approved for Summer term

### *May*

Tuesday, 3	Grades due for courses with formal exams
Monday, 23	Victoria Day - University closed
TBD	Spring Convocations

### *July*

Friday, 1	Canada Day - University closed Last day to apply to graduate in October without paying a fee
-----------	-------------------------------------------------------------------------------------------------

### *August*

Monday, 1	Halifax/Dartmouth Natal Day - University closed
Wednesday, 31	Last day for those expecting to receive graduate degrees in October to make <a href="#">electronic submission</a> of approved thesis to FGS  Last day to have Leave of Absence or change of student status approved by Graduate Studies for Fall term

# General Information

## Admission Dates 2021/2022

### Final Dates for Receipt of Applications for Admission

#### *Regular Session - September Start Date*

- **Graduate Studies**<sup>1,2</sup> (except as below) June 1
- Non-Canadian Students (Graduate Studies) April 1

Several programs have different application deadlines. **Please refer to the specific departmental sections in the calendar for these dates**

<sup>1</sup>All supporting documentation must be submitted by the appropriate deadline.

<sup>2</sup> Consideration for scholarship support often requires applications to be completed before the indicated deadlines to allow for program review and nomination. Please review scholarship deadlines on the Faculty of Graduate Studies Funding Opportunities website, and plan to submit complete applications in advance of these deadlines.

#### *Admission in January or May*

Some programs allow for a student to start either January 1 or May 1. Check the detailed program descriptions or with the department directly to see if such start dates are permitted. See Faculty Regulation 4.2, for appropriate application deadlines.

#### General Application Deadlines Canadian Applicants Non-Canadian Applicants

For September Admission	June 1	April 1
For January Admission	October 31	August 31
For May Admission	February 28	December 31

## Definitions

The following definitions are intended to facilitate an understanding of the calendar and not to define all words and phrases used in the calendar which may have specific meanings.

#### *Academic Dismissal*

A student's required withdrawal from a program due to unsatisfactory academic performance.

#### *Academic Program*

A distinct group of courses and other requirements which lead to eligibility for a degree or other university-awarded credential.

#### *Academic Terms*

- Fall term: September - December
- Winter term: January - April
- Summer term: May - August
- Regular term: September - April

#### *Advanced Standing*

Students possessing advanced knowledge of a subject will be encouraged to begin their studies in that subject at a level appropriate to their knowledge, as determined by the department/school/college concerned. However, such students must complete, at Dalhousie, the full number of credit hours required for the particular credential being sought.

#### *Audit Student*

A student permitted to attend courses but not expected to prepare assignments, write papers, tests, or examinations. Credit is not given nor is a mark awarded for courses. Courses appear on the transcript with the notation "Aud". If not already admitted to the University, audit students must apply. Students may register to audit a course only after the first day of courses.

### ***Candidate***

The term candidate for a doctoral degree is used to identify a student who has fulfilled all the requirements for the PhD except for the submission and defence of the thesis; thus, a candidate will have successfully completed the residency requirement, all course work, qualifying and comprehensive examinations (as applicable), and the thesis proposal defence (if applicable). This status is equivalent to the common terms "all but the thesis" or "all but dissertation" used at some institutions. The term candidate cannot be employed with regard to a Masters degree student.

### ***Clerkship***

See Internship

### ***Clinical Practice***

See Internship

### ***Continuing Fees***

The tuition fees charged to graduate students who have fulfilled their program fee requirements but have yet to complete all their degree requirements. See [Faculty of Graduate Studies Regulations](#).

### ***Co-operative Education***

A program where academic study is combined with career related work experience.

### ***Co-requisite***

Requirement which can be fulfilled concurrently with the course being considered.

### ***Course***

A unit of study in a subject area. Such a course is identified by a course/subject label, number, credit value and title (e.g., ENGL 1100.03: Writing for University).

### ***Credit***

A unit by which University course work is measured. One course is normally worth one half credit or three credit hours.

### ***Credit Hours***

One course is normally equal to three credit hours (e.g., ENGL 1100.03: Writing for University = 3 credit hours).

### ***CRN***

Each course has a course reference number (CRN) attached to it. This number is to be used when registering for courses.

### ***Crosslisted Courses***

Courses are crosslisted based upon course content that deals with more than one subject area in a substantive way. The crosslisting recognizes the interdisciplinary nature of the course.

### ***Email***

Email is an authorized means of communication for academic and administrative purposes within Dalhousie. The University will assign all students an official email address. This address will remain in effect while the student remains registered and for one academic term following a student's last registration. This is the only email address that will be used for communication with students regarding all academic and administrative matters. Any redirection of email will be at the student's own risk. Each student is expected to check her or his official email address frequently in order to stay current with Dalhousie communications.

### ***Exclusion***

An exclusion is when one course is sufficiently similar to another course that credit will only be given once if both are taken.

### ***Externship***

See Internship.

### ***Fieldwork***

See Internship.

### ***Full-time Students***

Those registered for 18 credit hours for UG, AC, HP level; 12 credit hours for TC level or more in the Regular term OR the equivalent of nine credit hours for UG, AC, HP level; six credit hours for TC level courses or more in either the Summer, Fall or Winter term.

### ***Good Standing***

Students who meet the required GPA are considered to be in good academic standing.

### ***Grade Point Average (GPA)***

Weighted sum of the grade points earned, divided by the number of credit hours enrolled.

- Term GPA: Courses taken in a single term.
- Cumulative GPA: All courses taken while registered in a level of study.

In the case of a course that has been repeated, only the highest grade is included.

### ***GSIS***

Graduate Student Information System. The electronic database used to approve graduate student program requirements and progress.

### ***Graduate Student***

A student with a Bachelor's degree, usually with Honours or equivalent, enrolled in a Master's or Doctoral program, or a graduate diploma program.

### ***Internship, Fieldwork, Clinical Practice, Externship, Practicum, Clerkship***

These terms are used in programs to describe practical professional educational experiences that are conducted in a non-university setting such as a health or social service agency.

### ***Letter of Permission***

A Letter of Permission authorizes a Dalhousie student to take a course(s) at another institution for credit towards a Dalhousie qualification. Such permission must be obtained in advance of taking the course(s).

### ***Level of Study***

The following are levels of study:

TC	Technology Diploma - Faculty of Agriculture
AC	Architecture/Engineering (Years 3 and 4)
HP	Health
UG	Agriculture
	Arts & Social Sciences
	Computer Science
	Engineering (Years 1 and 2) and Bachelor of Food Science
	Management
	Science

### ***Multi-Term Course***

**Undergraduate Multi-Term Course:** A course that spans multiple terms in an academic year. A final grade is awarded upon successful completion of the course

**Graduate Multi-Term Course:** A course that spans multiple terms in an academic year. A final grade is awarded upon successful completion of the course.

**Graduate In-Progress Course:** The grade of "In Progress" (IP) is used to identify and report on-going satisfactory progress in thesis, research projects, and courses/seminars structured to progress over a flexible number of academic terms. Students are expected to register in the course in each term that they are engaged in course-related activities. A final grade will be assigned in the academic term where course requirements are met.

### ***Non-thesis Program***

A Master's program of study based on course work which may also include a research project. This includes many of the professional graduate programs. Some of these programs also offer a thesis option.

### ***Part-time Students***

Students registered for fewer than 18 credit hours for UG, AC, HP level; 12 credit hours for TC level OR the equivalent of nine credit hours for UG, AC, HP level; six credit hours for TC level courses in either the Summer, Fall or Winter term.

### ***Part-time Graduate Student (Program Fee)***

A part-time graduate student paying program fees is a student who has been approved by the department and the Faculty of Graduate Studies as working part-time on their graduate degree. A part-time graduate student is taking less than nine credit hours per term.

### ***Part-time Student (Per Course Fee)***

A student who is taking less than nine credit hours in a term is considered a part-time student.

### ***Per Course Fee***

The fees charged to students in a Per-Course Fee Degree. Students pay fees according to the number of courses taken in any given term.

### ***Practicum***

See Internship.

### ***Prerequisite***

A requirement that must be fulfilled prior to registering in a specific course.

### ***Probation***

Warning to students that their academic performance is unsatisfactory and that they will be dismissed from their program unless their performance improves by the end of the next term.

### ***Program Fees***

The tuition fees charged to students in a program-fee degree. The program fee is based on total tuition for a specified number of years, varying according to academic program. Students who have not completed their program after the specified number of years are required to pay a continuing fee.

### ***Qualifying Students (Master's only)***

A full-time or part-time student with a Bachelor's degree or its equivalent in whom a department has expressed an interest as a potential graduate student, but who is without a sufficient GPA or academic background in a particular discipline to be enrolled directly in a Master's program.

### ***Residency***

The period of time that graduate students are expected to be on campus for fulfillment of their formal program requirements. In some programs, part of the residency period may, with permission, include some time off campus (e.g., for fieldwork or research).

### ***Scholarship GPA***

See [Awards section](#).

### ***Special Students***

Students who are not candidates for a degree or diploma but who wish to take courses which may be allowed for credit. This is not the same as auditing a course. Special students must satisfy normal admission requirements.

### ***Special Student - Graduate Studies (SSGS)***

A Student who is not registered in a graduate program but is taking graduate courses. Special students must satisfy normal admission requirements.

### ***Supervisor***

The supervisor is a member of Faculty of Graduate Studies who is directly responsible for the supervision of a graduate student's program. In this capacity, the supervisor assists the student in planning a program, ensures that the student is aware of all program requirements, degree regulations, and general regulations of the department and Faculty of Graduate Studies, provides counsel on all aspects of the program, and stays informed about the student's research activities and progress. The supervisor is also charged with ensuring that a student's research is effective, safe, productive, and ethical. Specific duties of the supervisor include

preparation of a program of study with the student, arrangement of and attendance at all supervisory committee meetings and candidate examinations, while ensuring that these exams are scheduled and held in accordance with Faculty of Graduate Studies and Departmental regulations and reviewing the thesis both in draft and in final forms.

### ***Thesis Only Fees***

See Continuing Fees.

### ***Thesis Program***

A Master's or Doctoral program of study involving a major research component in the form of a written thesis. Some programs offer a non-thesis option.

### ***Transcript***

A transcript is a complete history of a student's academic record at Dalhousie. Partial transcripts, e.g., a portion of a student's record pertaining to registration in a particular degree, faculty, or level of study, are not issued.

### ***Transfer Student***

A transfer student is one who is awarded credit towards a Dalhousie degree for academic work completed at a previous university or equivalent institution of higher learning.

### ***Undergraduates***

Students who are candidates for an undergraduate degree or diploma.

### ***Visiting Student***

A person permitted to take courses at Dalhousie for transfer of credit to another university.

### ***Visiting Student Graduate Studies (VSGS)***

- a. A person permitted to take courses at Dalhousie for transfer of credit to another university (Letter of Permission required).
- b. A person permitted to work with a Dalhousie researcher for thesis work at another university (Research).

### ***Work Term***

Career related work experience required in Co-operative Education programs. Work terms are usually 13-16 weeks in duration.

### ***Writing Intensive***

Writing Intensive courses are those which emphasize the process of writing, frequency of writing assignments, and weighting of those assignments in the course grades. A Writing Intensive course is normally taken as a sequel to a Writing Requirement course but does not satisfy the Writing Requirement.

## **Course Codes**

### ***Numbers***

0010-0099 pre university preparation courses

0100-0300 technology level courses

1000 level courses are introductory

2000-4000 level courses are advanced

5000-9000 level are Graduate level (with some exceptions)

### ***Credit Hours—examples only***

.06 credit hours = 6 credit hours = 1 full credit UG, AC, HP level

.03 credit hours = 3 credit hours = ½ credit UG, AC, HP level

.02 credit hours = 2 credit hours = ½ credit TC level

### ***Subject Codes***

Four letter codes are used to describe the subject area of a particular course. The following list of codes reflects subject areas courses are currently offered in:

ACAD - Academic

ACSC - Actuarial Science

AGRI - Agriculture

AGRN - Agronomy

ANAT - Anatomy & Neurobiology  
 ANSC - Animal Science  
 APSC - Applied Science  
 AQUA - Aquaculture  
 ARBC - Arabic  
 ARCH - Architecture  
 ARTC - Applied Health Services Research  
 ARTS - Art  
 ASSC - Arts and Social Sciences Interdisciplinary  
 BIOA - Biology (Faculty of Agriculture)  
 BIOC - Biochemistry and Molecular Biology  
 BIOE - Biological Engineering  
 BIOL - Biology  
 BIOT - Bioethics  
 BMNG - Biomedical Engineering  
 BUSI - Business Administration  
 BVSC - Bioveterinary Science  
 CANA - Canadian Studies  
 CH&E - Community Health & Epidemiology  
 CHEE - Chemical Engineering  
 CHEM - Chemistry  
 CHIN - Chinese  
 CHMA - Chemistry (Faculty of Agriculture)  
 CIVL - Civil Engineering  
 CLAS - Classics  
 CMMT - Communications  
 CNLT - Centre for Learning and Teaching  
 COMM - Commerce  
 CPST - Complimentary Studies  
 CRWR - Creative Writing  
 CSCA - Computer Science (Faculty of Agriculture)  
 CSCI - Computer Science  
 CTMP - Contemporary Studies  
 DEHY - Dental Hygiene  
 DENQ - Dentistry Qualifying  
 DENT - Dentistry  
 DISM - Disability Management  
 DMUT - Diagnostic Medical Ultrasound Technology  
 ECED - Electrical and Computer Engineering  
 ECMM - Electronic Commerce  
 ECOA - Economics (Faculty of Agriculture)  
 ECON - Economics  
 EGLA - English (Faculty of Agriculture)  
 EMSP - Early Modern Studies  
 ENGI - Engineering  
 ENGL - English  
 ENGM - Engineering Mathematics  
 ENGN - Engineering (Faculty of Agriculture)  
 ENSL - English Language (Continuing Education)  
 ENVA - Environmental Sciences (Faculty of Agriculture)  
 ENVE - Environmental Engineering  
 ENVI - Environmental Studies  
 ENVS - Environmental Science  
 EARTH - Earth Sciences  
 EURO - European Studies  
 EXTE - Extension Education  
 FIGA - First Year Interest Groups - Arts and Social Sciences

FIGS - First Year Interest Groups - Science  
 FILM - Film Studies  
 FOOD - Food Science (Faculty of Agriculture)  
 FOSC - Food Science  
 FREN - French  
 FRNA - French (Faculty of Agriculture)  
 GELA - Geology  
 GEOA - Geography (Faculty of Agriculture)  
 GEOG - Geography  
 GENE - Genetics  
 GERM - German  
 GWST - Gender and Women's Studies  
 HAHP - Health and Human Performance  
 HESA - Health Administration  
 HINF - Health Informatics  
 HISA - History (Faculty of Agriculture)  
 HIST - History  
 HLTH - Health Professions  
 HORT - Horticulture  
 HPRO - Health Promotion  
 HSCE - Health Sciences Education  
 HSTC - History of Science and Technology  
 HUCD - Human Communication Disorders  
 IAGR - International Development (Faculty of Agriculture)  
 IDHS - Interdisciplinary Health Studies  
 INDG - Indigenous Studies  
 IENG - Industrial Engineering  
 INFB - International Food Business  
 INFO - Information Management  
 INFX - Informatics  
 INTA - Internship (Faculty of Agriculture)  
 INTD - International Development Studies  
 INTE - Interdisciplinary Studies (Graduate)  
 INWK - Engineering Internetworking  
 IPHE - Interprofessional Health Education  
 ITAL - Italian  
 JOUR - Journalism  
 KINE - Kinesiology  
 KING - King's Foundation Year Programme  
 LARC - Landscape Architecture  
 LAWS - Law  
 LEIS - Leisure Studies  
 LJSO - Law, Justice and Society  
 MARA - Marine Affairs  
 MARI - Marine Biology  
 MATH - Mathematics  
 MATL - Materials Engineering  
 MCRA - Microbiology (Faculty of Agriculture)  
 MDLT - Medical Lab Technology  
 MECH - Mechanical Engineering  
 MEDI - Medicine  
 MEDP - Medical Physics  
 MEDR - Medical Research  
 MEDS - Medical Sciences  
 MGMT - Management  
 MGTA - Management (Faculty of Agriculture)  
 MICI - Microbiology & Immunology



MINE - Mineral Resource Engineering  
MRIT - Magnetic Resonance Imaging Technology  
MTHA - Mathematics (Faculty of Agriculture)  
MUSC - Music  
NESC - Neuroscience  
NUMT - Nuclear Medicine Technology  
NURS - Nursing  
NUTR - Nutrition  
OCCU - Occupational Therapy  
OCEA - Oceanography  
ORAL - Oral & Maxillofacial Surgery  
PATH - Pathology  
PEAS - Process Engineering and Applied Science  
PERF - Performance Studies  
PERI - Periodontics  
PETR - Petroleum Engineering  
PGMD - Post-Graduate Medicine  
PGPH - Post-Graduate Pharmacy  
PHAC - Pharmacology  
PHAR - Pharmacy  
PHDP - PHD Program  
PHIL - Philosophy  
PHLA - Philosophy (Faculty of Agriculture)  
PHYC - Physics and Atmospheric Science  
PHYL - Physiology  
PHYS - Physics (Faculty of Agriculture)  
PHYT - Physiotherapy  
PLAN - Planning  
PLSC - Plant Science  
POLI - Political Science  
POLS - Political Science (Faculty of Agriculture)  
PROS - Prosthodontics  
PSYC - Psychology (Faculty of Agriculture)  
PSYO - Psychology  
PSYR - Psychiatry  
PUAD - Public Administration  
RADT - Radiological Technology  
REGN - Registration Course - Graduate  
RELS - Religious Studies  
RESM - Research Methods/Project Seminars  
RSPT - Respiratory Therapy  
RURS - Rural Studies  
RUSN - Russian Studies  
SCIE - Science  
SLWK - Social Work  
SOCI - Sociology (Faculty of Agriculture)  
SOIL - Soils  
SOSA - Sociology and Social Anthropology  
SPAN - Spanish and Latin American Studies  
SPEC - Special Topics  
SPNA - Spanish (Faculty of Agriculture)  
STAA - Statistics (Faculty of Agriculture)  
STAT - Statistics  
SUST - Sustainability  
THEA - Theatre  
TYPR - Transition Year Program

# Dalhousie University

## Executive Officers

### ***President and Vice-Chancellor***

Deep Saini, PhD

### ***Provost and Vice-President, Academic (Acting)***

Frank Harvey, BA, MA, PhD

### ***Vice-President, Research and Innovation***

Alice Aiken, CD, BScPT, BSc (Kin), MSc, PhD

### ***Vice-President, Finance and Administration***

Gitta Kulczycki, CPA, CA, MBA

### ***Vice-President, Advancement***

Peter Fardy, BA, MBA

### ***Associate Vice-President, Academic***

Vivian Howard, MA, MLIS, PhD

Christopher Moore, BA, PhD

### ***Associate Vice-President, Research***

Graham Gagnon, PhD, PEng

### ***Associate Vice-President, Research (Ocean) and Scientific Director, Ocean Frontier Institute***

Anya Waite, PhD

### ***Vice-Provost, Equity and Inclusion***

Theresa Rajack-Talley, PhD

### ***Vice-Provost, Planning and Analytics***

Susan Spence, MHA

### ***Vice-Provost, Student Affairs (Acting)***

Verity Turpin, MEC, CPA, CMA

### ***Assistant Vice-Provost, Student Affairs***

Emily Huner, MBA, CPA, CMA

### ***Assistant Vice-Provost (Student Affairs) & University Registrar***

Adam Robertson, BA, MA

### ***Assistant Vice-Provost, Planning and Strategy***

Leanne French-Munn

### ***Assistant Vice-President, Alumni and External Engagement***

Sheila Blair-Reid, BComm

### ***Assistant Vice-President, Ancillary Services***

Heather Sutherland, BSc, MEd

### ***Assistant Vice-President, Communications and Marketing***

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### ***Assistant Vice-President, Development***

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***Assistant Vice-President, Facilities Management***

Peter Coutts, PEng, GSC

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***Assistant Vice-President, Government Relations and Economic Development***

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***Assistant Vice-President, Human Resources***

Jasmine Walsh, BA, LLB

***Assistant Vice-President, Industry Relations and Executive Director, Industry Liaison and Innovation***

Stephen Hartlen, BComm

***Assistant Vice-President - Chief Information Officer, Information Technology Services***

Joshua Leon, BSc, MSc, PhD, PEng

***Assistant Vice-President, Research Services***

Nancy Hayter, MA

***General Counsel and Managing Director***

John Hope, BA, LLB

***University Librarian***

Donna Bourne-Tyson, BA, MA, MLIS

**Deans of Faculties**

***Agriculture***

David Gray, BSc, PhD; Dean and Campus Principal

***Architecture and Planning (Acting)***

John Newhook, BEng, MAsC, PhD, PEng

***Arts and Social Sciences (Acting)***

Roberta Barker, BA, MA, PhD

***Computer Science***

Andrew Rau-Chaplin, BCS, MCS, PhD

***Dentistry***

Benjamin Davis, Bsc, DDS, FRCD(c), Dip OMFS and Anaesthesia

***Engineering***

John Newhook, BEng, MAsC, PhD, PEng

***Graduate Studies***

Marty Leonard, BSc, MSc, PhD

***Health***

Brenda Merritt, BS, MS, PhD

***Law (Acting)***

Richard Devlin, LLB, LLM

***Management***

Kim Brooks, BA, LLB, LLM

***Medicine***

David Anderson, MD, FRCPC, FACP

### ***Science***

Christopher Moore, BA, PhD

### ***College of Continuing Education***

Dianne Tyers, MA, MPA, PhD

### ***College of Arts and Science, Provost***

Christopher Moore, BA, PhD

Roberta Barker, BA, MA, PhD (Acting)

## **Executive Directors**

### ***Advancement Marketing and Donor Relations (Acting)***

Trista Walker

### ***Advancement Operations***

Kevin MacDonell

### ***Athletics and Recreation***

Tim Maloney

### ***Centre for Learning and Teaching***

Brad Wuetherick, BA, MA

### ***Dalhousie Analytics (Chief Analyst and Director)***

Claudia Rangel Jiminez, MS, MSc, PhD

### ***Environmental Health and Safety***

Jerry Aguinaga, MSc, CRSP, CHRP

### ***Innovation and Entrepreneurship***

Jeff Larsen

### ***Sustainability Office***

Rochelle Owen, BSc, MES

## **Directors**

### ***Art Gallery***

Peter Dykhuis, BFA

### ***Health Services***

Glenn Andrea, MD

### ***Internal Audit Services***

Margaret Sterns, BBA, CA

## **Board of Governors**

The Board of Governors of Dalhousie University is responsible for the overall conduct, management, administration and control of the property, revenue, business, and affairs of the university. The basic responsibility of the board is to represent the interests of the university in directing its affairs and to do so within the statutes relating to Dalhousie University. The Board consists of representatives named by the Government of Nova Scotia, Senate, the alumni, and students.

### ***Chancellor***

Scott Brison

### ***Chancellor Emeriti***

Rueben Cohen

Graham Day

Richard Goldbloom

Frederick Fountain

Anne McLellan

***Ex-Officio***

Scott Brison, University Chancellor

Deep Saini, President and Vice-Chancellor

Kevin Hewitt, Chair of Senate

***Order-in-Council***

Robert Hanf, Chair, Board of Governors

Sherry Porter, Vice-Chair, Board of Governors

Level Chan

Cassandra Dorrington

Joyce Hoeven

Angeline Gillis (appointment in progress)

Laurie Jennings

Jay MacIsaac

Michelle Williams

***Board Appointed Representatives***

Kristan Hines

Merle MacIsaac

Robert Richardson

***Alumni Representatives***

Paul Beesley

Cheryl Fraser

Brian R. Johnston

Devarsh Sood

***Student Representatives***

Aparna Mohan

Fatima Beydoun

Madeleine Stinson

***Faculty Representatives***

Ahsan Habib

Carolyn McLarney

***Observer for Faculty Association***

Julia Wright, PhD

President, Dalhousie Faculty Association

***University Secretary***

Susan Brousseau

**Senate**

The Senate is the University's senior academic decision-making body. It is responsible for the approval of new programs and academic units and it manages the reviews of Faculties, Centres, and Institutes. Senate approves the granting of degrees and diplomas, including the conferral of Honorary Degrees. It is responsible for setting academic regulations which affect the University as a whole, including regulations governing student conduct and discipline, as well as regulations concerning faculty tenure and promotion.

Senate has 96 members - 3 Executive Officers; namely, Chair of Senate, Vice-Chair (Academic Programs) and Vice-Chair (Student Affairs), 62 elected Faculty representatives, 19 academic administrators (President, Provost and Vice-President Academic, Vice-President, Research, University Librarian, and the Deans of each Faculty), 11 students elected by the Dalhousie Student Union (one

of whom shall be a graduate student and one who should represent the Agricultural Campus), and a representative from the University of King's College.

Senate normally meets on the second Monday of each month from 3:00 - 5:00 pm. In addition, if there are sufficient items of business, Senate will meet on the fourth Monday of the month, from 3:00 - 5:00pm

***Chair of Senate***

Kevin C. Hewitt, PhD

***Vice-Chair (Academic Programs) (Interim)***

Louise Spiteri, PhD

***Vice-Chair (Student Affairs)***

Maria Pacurar, PhD

## **Dalhousie University**

Dalhousie University blends the finest academic traditions with innovative thinking and outstanding educational opportunities. Located on Canada's east coast - an area long known for its natural beauty and friendly people - Dalhousie is a warm and welcoming university that attracts students from around the globe.

Dalhousie has been at the heart of Halifax, Nova Scotia - a lively coastal city - for almost 200 years. The university features both a historic, tree-lined urban campus and a rural agricultural campus, located about an hour from the city in Truro/Bible Hill. Dalhousie combines a welcoming atmosphere with the international prestige of a big-name school. With 13 faculties and more than 4,000 classes in over 180 areas of study, the university offers its more than 19,000 students a wealth of choice and innovative degree programs.

Dalhousie encourages student learning through exchange programs, fieldwork, community service and cooperative education. Its collaborative learning environment encourages students to interact with one another and with faculty experts to share ideas and offer new perspectives. A member of the U15, Canada's elite research-intensive universities, Dalhousie features the culture of a more intimate undergraduate college with the opportunities of a larger research institution.

This collaborative spirit also extends off campus. Dalhousie conducts research in partnership with teaching hospitals, professional organizations, businesses and industry, non-profit agencies and other universities. As Atlantic Canada's leading research university, Dalhousie attracts more than \$150 million in external research funding annually. The university serves as the regional hub for health research, has significant expertise in clean technology, and is a world leader in ocean initiatives.

Atlantic Canada's only Faculty of Agriculture, offering programs in areas such as international food business, pre-veterinary medicine, and plant sciences, is located at Dalhousie's Agricultural Campus.

The University of King's College, situated adjacent to the Dalhousie campus, is an affiliated institution, and its students in arts and science receive Dalhousie degrees in the name of both institutions.

Dalhousie University is a member of the Association of Universities and Colleges of Canada, the Association of Atlantic Universities, and the Association of Commonwealth Universities.

## **University Regulations**

### **General**

1. The Senate is charged with the internal regulations of the University, including all matters relating to academic affairs and discipline, subject to the approval of the Board of Governors. Within the general policies approved by Senate, academic requirements are administered by the Faculty concerned.
2. All students must agree to obey all the regulations of the University already made or to be made. Students must also comply with the regulations of the Faculty in which they are registered and pay the required fees and deposits before entering any course or taking any examinations. Additionally, students are advised that this Calendar is not an all-inclusive set of rules and regulations but represents only a portion of the rules and regulations that will govern the

student's relationship with the University. Other rules and regulations are contained in additional publications that are available to the student from the Registrar's Office and/or the relevant Faculty, Department or School.

3. Students are bound by the regulations of the home faculty regardless of the faculty in which the student takes courses.
4. Students should be aware that certain courses at the University involve required laboratory work where potentially hazardous materials are in use. These may include animals, other biological materials which may include crops and products, tissues, fluids, wastes, but also microorganisms and toxins as well as a wide variety of chemicals. Examples of physical hazards may include noise, radioactive isotopes, and non-ionizing radiation (e.g., lasers). Since there are potential health risks associated with the improper handling of such materials resulting in exposure, Dalhousie University requires that, as a condition of taking a course where such materials are to be used, students must read and agree to comply with the instructions for the safe handling of such materials. In the event that students do not comply with the instructions for the safe handling of such materials, students will receive no credit for the required laboratory work unless other acceptable alternatives are arranged with the instructor. In many cases, alternate arrangements are not possible, and students should consider enrolling in a different course.

## **Rescission of Acceptance into a Program**

Dalhousie University reserves the right to rescind any acceptance of an applicant into a program or to rescind an offer of admission of an applicant into a program. Such rescission shall be in writing and may be made by the President or the Vice-President (Academic) and Provost, in consultation with the appropriate Dean, at any time prior to the applicant's registration being confirmed by the Registrar. Any such rescission shall be reported to the Senate in camera.

## **Official Examination Regulations**

1. Candidates will not be admitted to the Examination Room more than thirty minutes after the beginning of the examination. Candidates will not be permitted to leave the examination within the first 30 minutes.
2. Candidates are required to present their valid Dalhousie ID card at all examinations scheduled during the official examination periods and sign the signature list when used.
3. No articles such as books, papers, etc. may be taken into the examination room unless provision has been made by the examiner for reference books and materials to be allowed to the students. All electronic computing, data storage, electronic dictionary and communication devices must be turned off, placed, and sealed in the opaque storage bag on the exam writing surface. Calculators may be used at the discretion of the instructor.
4. Candidates may not leave their seats during an examination except with the consent of the invigilator.
5. If more than one book is used, the total number should be marked in the space provided above. The other books should be properly marked and placed inside the first book. All books supplied must be returned to the invigilator.
6. Candidates found communicating with one another in any way or under any pretext whatever, or having unauthorized books, papers, electronic computing, data storage, or communication devices in their possession, even if their use be not proved, will be investigated by the Chief Invigilator. A written report will be submitted to the Faculty Academic Integrity Officer.
7. After the first thirty minutes have elapsed, students may hand in their examination book(s) to an invigilator and quietly leave the examination room. Candidates may not leave the examination room during the last 15 minutes of the examination.

## **Policy in the Event that a Formal Examination Cannot be Completed at the Regularly Scheduled Time**

Formal examinations, up to three hours in length, are scheduled by the Registrar each December and April during formal examination periods, as laid out in the Calendar. If, in the unusual event that one of these examinations must be postponed or abandoned at short notice, the following policies will apply.

1. If more than 50 percent of the time allocated for the examination has elapsed, students' work up to the premature end of the examination, but prorated for the actual time written, will lead to the mark to be obtained from the formal examination.

2. If less than 50 percent of the time allocated for any examination has elapsed, the examination will be rewritten as soon as possible, normally on a day when examinations are not scheduled. Students will be informed by the Registrar of the time and place of the rewrite on the Website of the Registrar (see link below).
3. In all cases in which a formal examination cannot be written at its scheduled time and special arrangements must be made, it is essential that faculty ensure that all students in the course are treated fairly and equitably and according to the evaluative criteria in the course description given to students at the beginning of the term. If an examination is terminated as under point #1, any student who feels disadvantaged by not having been able to write an examination for the length specified in the course description, may appeal through the appropriate departmental or school appeal mechanism for an examination of the specified length. Appeals will be in writing and in a timely fashion. If the appeal is granted, arrangements for such a makeup examination will be made between the student and the course professor.
4. If a formal examination cannot be written at its scheduled time, it is the responsibility of students to check the Registrar's Website for when the examination will be rewritten. Announcements will be made as soon as possible after the original time, normally within 24 hours, and rewrites will normally take place within the regular examination period.

<http://www.dal.ca/exams>

## Policy for the Scheduling of Courses/Examinations

Normally, the University schedules and conducts courses on weekdays (e.g., Monday to Friday and sometimes Saturday between 8:30am (start time) and 10pm (end time) Atlantic time), and sometimes Saturday, and examinations on weekdays and Saturdays, but not Sundays or statutory Holidays. No examinations or courses should be scheduled on Good Friday, Easter Saturday, or Easter Sunday. Otherwise, exams will be scheduled Monday through Saturday between 8:30am and 10pm Atlantic time, and sometimes Sunday between 12 noon and 10pm Atlantic time. However, the University reserves the right, in exceptional circumstances and with the approval of Senate, to schedule courses or examinations on Sundays or statutory holidays, as the case may be.

### Requests for an Alternative Final Examination Time Policy

A student requesting an alternative time for a final examination will be granted that request only in exceptional circumstances. Such circumstances include illness (with medical certificate) or other mitigating circumstances outside the control of the student, including technology failure in the case of online examinations. Students writing online tests or exams in other time zones may request an alternative exam time if they are scheduled to write a test or exam during a restricted time period after 10pm or before 8:30am local time. Elective arrangements (such as travel plans) are not considered acceptable grounds for granting an alternative examination time. In cases where it is necessary to make changes to examination arrangements late in the term, or Senate has approved exceptional examination arrangements, a special effort will be made to accommodate difficulties the changes may cause for individual students.

Instructors are expected to accommodate all reasonable requests for alternative examination times although the ultimate decision whether to grant a student's request for an alternative examination time lies with the instructor of the course concerned as does the responsibility for making the alternative arrangements.

This policy may also be applied at the discretion of the instructor to tests and examinations other than final examinations.

**Assistance and Support:** The Centre for Learning and Teaching (CLT) is available to provide assistance to Instructors in preparing examinations and in considering alternative forms of assessment. Academic Technology Services (ATS) can provide technical support to instructors offering online exams.

## Retention of Student Work

### *Faculties of Architecture & Planning and Engineering*

All work executed by students as part of their academic programs in the Faculties of Architecture & Planning and Engineering automatically becomes the property of the University and may be retained for exhibition or other purposes at any time and for an indefinite period.

### *Faculty of Computer Science*

The Faculty of Computer Science has the right to retain the original or a copy of any work handed in by students. This will only be used for evaluation or for administrative purposes. The permission of the originator of the work is required if it is to be used in any other way.



# Communication to Students

1. All students must report their local address while attending the University to the Registrar's Office, on registration or as soon as possible thereafter. Subsequent changes must be reported promptly. This may be done through <http://dalonline.dal.ca>
2. Email is an authorized means of communication for academic and administrative purposes within Dalhousie. The University will assign all students an official email address. This address will remain in effect while the student remains a student and for one academic term following a student's last registration. This is the only email address that will be used for communication with students regarding all academic and administrative matters. Any redirection of email will be at the student's own risk. Each student is expected to check their official email address frequently in order to stay current with Dalhousie communications.
3. Students who change their name while attending Dalhousie must provide proof of name change to the Registrar's Office.

## Student Absence Regulation

This regulation applies to all credit-bearing courses and programs.

Schedule A lists the Faculties, Colleges, and Schools whose programs and courses are excluded from this regulation. The Senate Office will add and remove academic units from this list based on direction from the Senate Learning and Teaching Committee (SLTC).

Students experiencing short-term or long-term absences that result in missed or late academic requirements may seek alternate arrangements with their instructors.

Students must review Faculty, College, School, course or instructor-specific syllabi and guidelines, and work-integrated learning handbook policies for the remediation of missed or late academic requirements. Absences may also result in the loss of class participation grades.

Course instructors may approve exceptions to this regulation to provide additional flexibility to students and to support students in successful completion of academic requirements. Faculties, Colleges, and Schools may approve changes to absence reporting timelines and to methods for providing absence information for the academic unit.

Any student who believes they will suffer undue hardship from the application of this academic regulation may [apply](#) for relief by completing an "[Application of a Waiver of an Academic Regulation](#)" form. Students wishing to appeal a decision denying the application for a waiver may appeal to the Academic Appeals Committee of the Faculty, College or School in which they are registered.

Requests for alternate arrangements for missed University-scheduled final exams are handled under a separate University regulation, "[Requests for an Alternative Final Examination Time](#)".

Students who provide false or fraudulent medical or other evidentiary documentation for their absences are subject to University discipline under the [Code of Student Conduct](#).

Information on managing absences may be provided by Dalhousie Student Health Services and Counselling Services and appear in the calendar entry with this regulation. Current information for the calendar appears in Schedule B and may be revised at their discretion.

### **Schedule A - List of Excluded Faculties, Colleges and Schools**

The following academic units have separate regulations to cover short-term and long-term absences that still meet the overall purpose of this regulation:

- Faculty of Dentistry
- Schulich School of Law
- Faculty of Medicine
- College of Pharmacy

Students in these Faculties, Colleges or Schools must refer to their current academic calendars for specific regulations or policies on missed or late academic requirements.

## **Schedule B – Supplementary information from Student Health and Wellness**

Dalhousie Student Health Services and Counselling Services will only provide sick notes or medical certificates to students for short-term absences in the following cases:

1. A student's Faculty or instructor is not using the "Student Absence Regulation",
2. The missed or late academic requirement is considered final coursework, or
3. The test or exam falls within the last two weeks of an academic term.

Students are encouraged to stay at home if they have a communicable illness (such as flu-like symptoms) that is manageable at home to prevent further spread of illness to other students, staff, or instructors.

For long-term absences, Dalhousie Student Health Services and/or Counselling Services will only provide documentation for students who have been under the care of a physician, registered nurse, social worker, psychologist, counsellor, or psychiatrist during the period of absence and/or for management of long-term or chronic physical or mental health conditions.

The full [Student Absence Regulation](#) is available.

## **Freedom of Information and Protection of Privacy**

The Freedom of Information and Protection of Privacy Act (FOIPOP) provides for the protection of an individual's right to privacy but also requires that certain records be disclosed upon request unless they are exempted from disclosure. The Act requires that the University not disclose personal information if that information would constitute an unreasonable invasion of personal privacy. Applicants to Dalhousie are advised that information they provide along with other information placed in a student file will be used in conjunction with university practices for internal university use and will not be disclosed to third parties except in compliance with the FOIPOP Act or as otherwise required by law.

## **Release of Information About Students**

The following information is available, without application through the Freedom of Information and Protection of Privacy Act:

### **I. Disclosure to students of their own records**

1. A transcript is a complete history of a student's academic record at Dalhousie. Partial transcripts, e.g. a portion of a student's record pertaining to registration in a particular degree, faculty or level of study only, are not issued.
2. Students have the right to inspect their academic record. An employee of the Registrar's Office will be present during such an inspection.
3. Students will, on submission of a signed request and payment of a fee where appropriate, have the right to receive transcripts of their own academic record. These transcripts will be marked "ISSUED TO STUDENT". Official transcripts will be sent on a student's request to other universities, or to business organizations, etc. The University will not release copies of transcripts if students owe monies to the University.
4. If transcripts are issued for a student while a senate discipline case is pending and the committee subsequently makes a decision that affects the student's transcript, revised transcripts will be sent to recipients if transcripts are issued while the case was pending.

### **II. Disclosure to Faculty, Administrative Officers, and Committees of the University**

Information on students may be disclosed without the consent of the student to University officials or committees deemed to have a legitimate educational interest.

### **III. Disclosure to Third Parties**

1. The following information is considered public information and may be released without restriction:
  - Name
  - Period of Registration
  - Certificates, Diplomas, Degrees awarded
  - Field of Study (as relates to degree awarded)

- Hometown and Awards/Distinctions\*

\*As indicated in the convocation program.

2. Information will be released without student consent to persons in compliance with a judicial order or subpoena or as required by federal or provincial legislation.
3. Necessary information may be released without student consent in an emergency if the knowledge of that information is required to protect the health or safety of the student or other persons. Such requests should be directed to the Registrar.
4. In compliance with Statistics Canada requirements, a student's national personal identification number assigned by the university or college first attended will routinely appear on a student's transcript of record.
5. The Federal Statistics Act provides the legal authority for Statistics Canada to obtain access to personal information held by educational institutions. The information may be used only for statistical purposes, and the confidentiality provisions of the Statistics Act prevent the information from being released in any way that would identify a student. Students who do not wish to have their information used are able to ask Statistics Canada to remove their identifying information from the national database by contacting us by:

Email: [PSIS-SIEP\\_contact@statcan.gc.ca](mailto:PSIS-SIEP_contact@statcan.gc.ca)

Mail: Institutional Surveys Section  
Centre for Education Statistics  
Statistics Canada Main Building  
SC2100-K Tunney's Pasture  
Ottawa, ON K1A 0T6

6. Students should also be aware that the Maritime Provinces Higher Education Commission (MPHEC) collects data on behalf of Statistics Canada, and that it uses the data for similar purposes. Statistics Canada will notify the MPHEC of any student choosing to have their personal information removed from the national database, and their information will subsequently be removed from the MPHEC's database. Further information on the use of this information can be obtained from the Statistics Canada Website [www.statcan.gc.ca](http://www.statcan.gc.ca).
1. Other than in the above situations, information on students will be released to third parties only at the written request of the student, or where the student has signed an agreement with a third party, one of the conditions of which is access to the student's record (e.g., in financial aid). This restriction applies to requests from parents, spouses, credit bureaus and police.

## Student Accommodation Policy

### D. Policy

1. Students experiencing barriers to participation in a University activity due to a characteristic protected under human rights legislation are entitled to accommodation to reduce or eliminate such barriers up to the point of undue hardship, as set out in this Policy.
2. All members of the University community share in the responsibility for compliance with this policy.
3. Students are encouraged to seek accommodation where they believe that they are experiencing a barrier to participation in a University activity, due to a characteristic protected under human rights legislation, which may be reduced or eliminated through accommodation.
4. All requests for accommodation shall be made by the student to the Centre in accordance with the Procedures and with all Guidelines and Protocols published by the Centre.
5. Accommodation requests shall be made prior to the University activity in question. There shall be no "after-the-fact" accommodation except in rare circumstances where significant psychological or mental health issues arise coincident with the activity in question.
6. Accommodation decisions will be reviewed on a regular basis and adjusted to the student's then current circumstances where necessary.
7. Accommodation decisions may be appealed by the student to the Vice-President Academic and Provost or delegate in accordance with the Procedures, and with the Guidelines and Protocols established by the Centre.

8. All documentation relating to a request for accommodation, including supporting documentation, shall be treated as strictly confidential, and shall not be disclosed to other persons without the consent of the student requesting the accommodation, except to the extent that such disclosure is necessary for the effective implementation of the accommodation decision or appeal of that decision.
9. Nothing in this Policy or Procedures shall take away from the student's right to seek the assistance of the applicable Human Rights Commission.

## C. Definitions

In this Policy:

"Centre" means the Student Accessibility Centre, Student Affairs;

"Student" means an individual registered in a course at the University, including the College of Continuing Education, but excluding residents in postgraduate medical or dental education programs;

"University activity" means an academic or non-academic activity conducted at, on behalf of, in connection with, or under the auspices of the University.

## A. Background and Purpose

This policy forms part of a broader, ongoing commitment to create a fully accessible university community, and acknowledges that, through dialogue, the university can better understand the nature and extent of campus barriers to accessibility. It is the responsibility of every member of the Dalhousie University community to be knowledgeable on institutional policies related to prohibited grounds for discriminatory practices and accessibility.

Pursuant to our obligations under human rights legislation, the purpose of this Policy is to affirm that Dalhousie University will make reasonable efforts to provide accommodations, up to the point of undue hardship, for students experiencing a barrier due a characteristic protected by human rights legislation, and to establish a framework for managing requests by students for accommodation in an appropriate and timely manner.

Accommodations are intended to reduce or eliminate barriers to participation in academic and student life experienced by individual students due to characteristics protected under human rights legislation.

## B. Application

This policy applies to academic and non-academic activity engaged in by students at, on behalf of, in connection with or under the auspices of the University.

Affirmative Action measures and programs aimed at correcting historic disadvantage for designated groups fall under distinct programs and do not form part of this policy.

Allegations of discrimination are addressed under the Statement on Prohibited Discrimination and the applicable procedures.

## E. Administrative Structure

1. Authority: This Policy and Procedures falls under the authority of the Vice-President Academic and Provost. The Centre is responsible for the day-to-day administration of this Policy and Procedures.
2. Guidelines and Protocols: Guidelines and Protocols published by the Centre will support the Policy and Procedures and facilitate the Centre's responsibility to administer the Policy.
3. Record-keeping: The Centre shall track and monitor data relating to accommodation requests, accommodation appeals, accommodation plans, and other matters relating to student accommodation.
4. Reporting: The Centre shall deliver an annual report to the Vice-Provost, Student Affairs and the Senate Committee on Learning and Teaching which will include:
  - a. Number of accommodation requests;
  - b. Representation of the nature of the requests and program of study;
  - c. Number of appeals and summary of decisions; and
  - d. Any service challenges or other issues presented.
5. Ongoing Training: Employees involved in administering this Policy and Procedures will participate in regular training on applicable human rights issues by the Human Rights and Equity Advisor, a minimum of once annually.

## F. Procedures

1. **Request for Accommodation:** A request for accommodation shall be made by the student to the Centre prior to the University activity in question in accordance with Guidelines and Protocols established by the Centre.
2. **Preliminary Assessment:** The Centre shall make a preliminary assessment of the request to determine the nature of the barrier experienced by the student and the connection of that barrier to a characteristic protected by human rights legislation. If both cannot be established, then the request shall be denied.
3. **Factors to be Considered:** Where an accommodation is to be provided, it must be reasonable, up to the point of undue hardship. The relevant factors to be taken into account in determining a reasonable accommodation will include, but are not limited to, the following:
  - a) Linkage – whether the proposed accommodation will have the practical effect of eliminating or reducing the identified barrier;
  - b) Safety – whether the proposed accommodation would pose a safety risk to faculty, staff or other students or to the student seeking accommodation;
  - c) Financial Cost – whether the anticipated expenses (estimated out-of-pocket expenses to put the accommodation in place together with any long-term expenses to sustain the proposed accommodation), are likely to be cost-prohibitive;
  - d) Size and nature of the program or service – whether the proposed accommodation would be exceedingly disruptive to the program or service, taking into consideration the number of students, faculty, staff and others affected as well as the nature and inter- relationships of their roles;
  - e) Impact on academic requirements – whether the proposed accommodation will substantially undermine the academic requirements of the program; and
  - f) Alternatives – where a requested accommodation appears to create an undue hardship based on the above factors, whether an alternative accommodation may be available.
4. **Consultation and Decision:** Having regard for the factors set out in section F.3, and following consultation, as appropriate to the circumstances, with:
  - a. the student;
  - b. the course instructor in the case of an academic accommodation;
  - c. the clinical coordinator in the case of an accommodation in a clinical placement;
  - d. the administrator responsible for the University activity in question;
  - e. administrators responsible for coordinating accommodations in professional Faculties; and/or
  - f. others that may be warranted by the circumstances; the Centre will decide what accommodation will be provided.
5. **Objection to decision:** If a student disagrees with the accommodation decision, the student should attempt to resolve the matter through informal discussions with the Centre.
6. **Appeal:** If the student's objection cannot be resolved, the student may appeal the decision by filing a written appeal to the Vice-President Academic and Provost within 10 calendar days of the date that the Centre made its final decision in accordance with the Guidelines or Protocols established by the Centre. The Vice-President Academic and Provost may designate an Associate Vice-President Academic to act in their place. The Vice-President Academic and Provost or designate may uphold the initial accommodation decision or may determine that an alternative form of accommodation should be provided. This decision is final and cannot be appealed further.

## Student Accommodation Policy

### Policy on the Submission of Student Papers

#### Procedures

If an instructor plans to use originality-checking software in a course, students shall be informed in the course syllabus that their written work may be submitted to a text-matching software service, which is meant to assure students that everyone will be evaluated on the basis of their own work and to warn students that plagiarism is likely to be detected. The planned use of originality-checking software will also be included in the oral presentation of the course syllabus in the initial course meeting.

Students shall also be informed in the course syllabus that they are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work.

Students shall inform instructors no later than two weeks after the commencement of courses of their intent to choose an alternate method.

Instructors shall provide students with at least two possible alternatives that are not unduly onerous and that are appropriate for the type of written work. Alternatives shall be chosen from the following:

- a) Submitting copies of multiple drafts demonstrating development of the work;
- b) Submitting an annotated bibliography;
- c) Submitting photocopies of sources; and
- d) Other alternatives devised by the instructor, provided that they are not unduly onerous.

## Policy on the Submission of Student Papers

Any instructor may require student assignments to be submitted in both written and electronic (computer-readable) form, e.g., a text file or as an email attachment, as defined by the instructor. Use of third-party originality checking software does not preclude instructor use of alternate means to identify lapses in originality and attribution. The results of such assessment may be used as evidence in any disciplinary action taken by the Senate.

## Intellectual Honesty

### Examples of Academic Offences

There are many possible forms of academic dishonesty. Since it is not possible to list all instances of academic dishonesty, the following list of examples should be considered only as a guide. The omission of a dishonest action from this list does not prevent the University from prosecuting an alleged instance of that action.

#### ***A. Plagiarism***

Members of academic communities are privileged to share in knowledge generated through the efforts of many. In return, each member of the community has the responsibility to acknowledge the source of the information used and to contribute knowledge that can in turn, be trusted and used by others. Consequently, the University attaches great importance to the contribution of original thought to learning and scholarship. It attaches equal importance to the appropriate acknowledgment of sources from which facts and opinions have been obtained.

Dalhousie University defines plagiarism as the submission or presentation of the work of another as if it were one's own.

Plagiarism is considered a serious academic offence that may lead to the assignment of a failing grade, suspension, or expulsion from the University. If a penalty results in a student no longer meeting the requirements of a degree that has been awarded, the University may rescind that degree.

Some examples of plagiarism are:

- failure to attribute authorship when using a broad spectrum of sources such as written or oral work, computer codes/programs, artistic or architectural works, scientific projects, performances, web page designs, graphical representations, diagrams, videos, and images;
- downloading all or part of the work of another from the Internet and submitting as one's own; and
- the use of a paper prepared by any person other than the individual claiming to be the author.

The proper use of footnotes and other methods of acknowledgment vary from one field of study to another. Failure to cite sources as required in the particular field of study in the preparation of essays, term papers and dissertations or theses may, in some cases, be considered to be plagiarism.

Students who are in any doubt about how to acknowledge sources should discuss the matter in advance with the faculty members for whom they are preparing assignments. In many academic departments, written statements on matters of this kind are made available as a matter of routine or can be obtained on request. Students may also take advantage of resources available through the Writing Centre at [writingcentre.dal.ca](http://writingcentre.dal.ca) or the Dalhousie Libraries at [www.library.dal.ca/services/infolit](http://www.library.dal.ca/services/infolit).

#### ***B. Irregularities in the Presentation of Data from Experiments, Field Studies, etc.***

Academic research is based on the presentation of accurate information and data that are obtained honestly. The trustworthiness of our findings is essential to building knowledge in and across fields of study. Therefore, the falsification of data in reports, theses,

dissertations, and other presentations is a serious academic offence, equivalent in degree to plagiarism, for which the penalties may include the assignment of a failing grade, suspension or expulsion from the University, or the withdrawal of a degree previously awarded.

### ***C. Other Irregularities***

Dalhousie University strives to provide equal opportunities for learners to demonstrate and to be recognized for their abilities. Any behaviour intended to gain unearned advantage over another person violates this principle. A member of the University who attempts, or who assists any other person in an attempt, to fulfill, by irregular procedures, any requirements for a course, commits an academic offence and is subject to a penalty.

In the absence of specific approval from the instructor of a course, all students should assume that every assignment is to be completed independently, without any form of collaboration.

Students should take reasonable precautions to prevent other students from having access, without permission, to their tests, assignments, essays, or term papers.

The following are some examples of irregular procedures. The list should be used only as a guide since it is not possible to cover all situations that may be considered by the Senate Discipline Committee to be irregular.

- writing an examination or test for someone else;
- attempting to obtain or accepting assistance from any other person during an examination or test;
- during the time one is writing an examination or test, having material that is not specifically approved by the instructor;
- without authorization, obtaining a copy of an examination or test, topic for an essay or paper, or other work;
- without authorization from the faculty member in charge of that course, submitting any work for academic credit when one is not the sole author or creator;
- without authorization submitting any work that has been previously accepted for academic credit in any other course in any degree, diploma, or certificate program, or has been completed as part of employment within the University, for example, as research activity. A repeated course is considered to be a separate course.

### ***D. Aiding in the Commission of an Academic Offence***

No student may encourage or aid another student in the commission of an academic offence, for example,

- by lending another student an assignment knowing that the other student may copy it for submission;
- by allowing another student to copy answers during an examination.

### ***E. Misrepresentation***

Any person who provides false or misleading information during an investigation of a suspected academic offence is guilty of an offence.

## **Intellectual Honesty**

A university should be a model of intellectual honesty. As such Dalhousie University shares in the academic values of honesty, trust, respect, fairness, and responsibility (Centre for Academic Integrity, 1999 - of which Dalhousie University is a member). Failure to meet the University's standards with respect to these values can result in an academic offence. The length of time a student has attended university, the presence of a dishonest intent and other circumstances may all be relevant to the seriousness with which the matter is viewed.

Violations of intellectual honesty are offensive to the entire academic community, not just to the individual faculty member and students in whose course an offence occurs.

Instructors are responsible for setting examinations and assignments as part of the learning process and for evaluating those examinations and assignments, including ensuring that any rules stated for the procedures used in an examination or assignment are followed. Any violation of such stated rules that could result in a student gaining an unfair or unearned advantage may be considered to be an academic offence.

## **Discipline**

1. Members of the University, both students and staff, are expected to comply with the general laws of the community, within the University as well as outside it.
2. Alleged breaches of discipline relating to student activities under the supervision of the Dalhousie Student Union are dealt with by the Student Union. Alleged breaches of discipline relating to life in the residences are dealt with by the residence discipline policy unless the President determines that some non-residence University interests are involved. Senate is charged with the authority to deal with cases of alleged academic offenses, see examples above, as well as with certain other offenses that are incompatible with constructive participation in an academic community.
3. On report of a serious breach of the law, or a serious academic offence deemed by the President, or in their absence by a Vice-President or the Dean of a Faculty, to affect vital University interests, a student involved may be temporarily suspended and denied admission to courses or to the University by the President, Vice-President, or Dean, but any suspension shall be reported to the Senate, together with the reasons for it, without delay.
4. No refund of fees will be made to any student required to lose credit for any course taken, required to withdraw or who is suspended or dismissed from any course or any Faculty of the University.

## Academic Dishonesty

### Faculty Discipline Procedures Concerning Allegations of Academic Offences

#### I. Preamble

These procedures deal with allegations of academic offences and do not deal with violations of the student code of conduct. The purpose of these procedures is to delegate assessment of certain allegations of academic offences to the Faculty level.

#### *Guideline for Evaluators*

An alleged first or later breach of any academic standard by a student should never be dealt with by an evaluator, but in all instances, should be referred to the Academic Integrity Officer in accordance with these procedures. Any attempt by any person or body other than the Senate, the Senate Discipline Committee, or the Academic Integrity Officers to impose a penalty for an alleged offence is null and void and leaves the student still liable to discipline for that offence. Further, a student remains liable to discipline for a suspected offence notwithstanding a failure on the part of an evaluator to report the allegation in accordance with these procedures.

Where an allegation of a breach of academic standards has been made or is pending, the evaluator should not reveal the mark or grade to anyone until the Vice Chair (Academic Administration) has confirmed the disposition of the matter by the Senate Discipline Committee or the Academic Integrity Officer.

#### II. Academic Integrity Officers

1. Academic Integrity Officers are associated with the Faculties of Dalhousie University.
2. The Academic Integrity Officer shall act between the student and instructor and may appear at Hearing Panels of the Discipline Committee or the Discipline Appeals Board to present the case against the student.
3. The Academic Integrity Officer is the Dean of the Faculty. The Dean may further delegate this role to one or more members of their academic staff except those who are Senate Officers, who are otherwise involved in the student discipline process, or who otherwise are in a potential conflict of interest relative to this role. Annually the name of the delegate(s) shall be communicated in writing to the Vice-Chair (Student Affairs) who shall report to Senate.
4. The Academic Integrity Officers shall meet as a group with the Senate Discipline Committee (SDC) at least once a year to discuss relevant policy issues and training requirements with a view to maximizing consistency and predictability in the administration of academic offences across the University. Such meetings will be convened and chaired by the Vice-Chair (Student Affairs).
5. **Penalties:** Penalties shall follow the guidelines contained within the University's Academic Regulations and the Senate Discipline Committee terms of reference set out in Section 10 of the Senate Constitution, which are reproduced below for convenience. "The range of penalties which may be imposed by the Senate Discipline Committee be circumscribed only by the requirement that such penalty or penalties be of an academic nature and, without restricting the generality of the foregoing, may include any one or more of:
  - 1) notation of the fact of discipline on the offender's transcript for a period of one or more years, but not exceed five years;
  - 2) repeat of the assignment that triggered the discipline;
  - 3) a failing grade or mark or assessment in the piece of work triggering the discipline;
  - 4) failure of the course or seminar or program;



- 5) failure of the academic year;
  - 6) suspension for an academic term or year (to a maximum suspension of three academic years);
  - 7) expulsion from the University;
  - 8) loss of a current or continuing scholarship, or both, or loss of eligibility to receive or to maintain scholarships or prizes or bursaries; and 9) removal from the Dean's List."
6. **Faculty Procedures** When an academic offence is suspected, the instructor shall submit a signed statement outlining the basis for the allegation, together with all relevant supporting evidence, to the Academic Integrity Officer of the Faculty which is responsible for the delivery of the course at issue, or in the case of an allegation in relation to a graduate thesis or other non-course graduate materials, to the Academic Integrity Officer of the Faculty of Graduate Studies, within 10 working days of becoming aware of the alleged offence, but in any event no later than the deadline for submission of final grades to the Registrar, except in extraordinary circumstances, as determined by the Academic Integrity Officer.
  7. Upon receipt of the material from the instructor, the Academic Integrity Officer shall determine whether or not the material supports a *prima facie* case that the student has committed an academic offence. If no *prima facie* case is made out, no further steps are taken in relation to the allegation, and the instructor and student will be so advised in writing.
  8. If a *prima facie* case is established, then the Academic Integrity Officer will take the following further steps:
    - a) Check the academic discipline database maintained by the Senate Office to determine if the student(s) has a record of prior academic offence(s);
    - b) With the exception of cases involving two or more students facing allegations arising from the same fact situation ("common allegation") which shall proceed in accordance with paragraph 9, if the student(s) has a record of prior academic offence(s), forward the allegation to the Senate Discipline Committee;
    - c) If the allegation appears to be a first offense, and in all cases of two or more students facing a common allegation, inform the student(s) in writing of the nature of the allegation, the instructor's statement, the evidence, the procedures to be followed, the possible penalties, and possible sources of advice and support (will be a standard document);
    - d) Convene a meeting with the student(s), the student(s)'s advisor, if any, and the instructor within five working days upon receipt of the allegation by the student, which time may be extended at the request of the student, instructor, or Academic Integrity Officer, in appropriate circumstances.;
    - e) If the meeting does not take place within the time set out above, the Academic Integrity Officer has the discretion to convene another meeting with the student(s), the student(s)'s advisor, if any, and the instructor. The Academic Integrity Officer also has the discretion to convene additional meetings as may be reasonably required. In the event an initial meeting does not occur within a reasonable time after a *prima facie* case is established, the Academic Integrity Officer shall refer the allegation to the Senate Discipline Committee.
  9. Notwithstanding paragraph 8b, in the case of two or more students facing allegations arising from the same fact situation ("common allegation"), the Academic Integrity Officer has the authority to convene a meeting with all such students in accordance with paragraphs 8d and 8e and to make findings for all such students under these Procedures, regardless of the fact that one or more of such students may have a record of prior academic offence(s). If the Academic Integrity Officer's assessment is that there is sufficient evidence to support a finding that a student facing a common allegation has committed an academic offence, for any such student who has no record of prior academic offence(s), subject to paragraph 14, the Academic Integrity Officer shall assess an appropriate penalty for the student in accordance with these Procedures; and for any such student who has a record of prior academic offence(s), the Academic Integrity Officer shall forward the matter to the Senate Discipline Committee for assessment of an appropriate penalty.
  10. Following the meeting convened in accordance with paragraph 8, the Academic Integrity Officer shall make a preliminary assessment of whether there is sufficient evidence to support a finding that the student has committed an academic offence, and if there is sufficient evidence, make a preliminary assessment of what penalty would be appropriate in the circumstances. In making the latter assessment, the Academic Integrity Officer shall exercise broad discretion in considering possible mitigating circumstances including but not limited to extraordinary personal circumstances and lack of educational experience.
  11. If the Academic Integrity Officer's assessment is that there is insufficient evidence to support a finding that the student has committed an academic offence, the Officer shall inform the student in writing with a copy to the Instructor within five working days of the meeting. This does not preclude an Academic Integrity Officer from proceeding with the allegation at a later date, should new evidence become available.
  12. If the Academic Integrity Officer's assessment is that there is sufficient evidence to support a finding that the student has committed an academic offence, AND that the appropriate penalty for the student's conduct is any of the penalties described in paragraph 5, above, except those listed in subparagraphs 5 to 9 the Academic Integrity Officer shall provide the student with the option of accepting the finding and the proposed penalty, or of proceeding to the Senate Discipline Committee for a full hearing. The option shall be presented to the student within five working days of the meeting, and the student shall have two working days to respond. In the event that the student elects to accept the finding and proposed penalty, the Academic Integrity Officer shall so advise the Vice-Chair (Student Affairs).

13. Within 14 calendar days of the Vice-Chair (Student Affairs) being advised of the finding and agreed penalty under paragraph 12, the Vice-Chair (Student Affairs), or in their absence, the Chair or Vice-Chair (Academic Programs), and a student Senator appointed by the Dalhousie Student Union shall jointly review the finding and agreed penalty to determine whether the process is consistent with the Faculty Discipline Procedures Concerning Allegations of Academic Offences. If so, they shall ratify the matter on behalf of Senate and the Vice-Chair shall notify the student and the Academic Integrity Officer of such ratification. For ratification to occur, the decision must be unanimous. The finding and agreed penalty shall stand, despite possible insubstantial procedural errors. The Vice-Chair (Student Affairs) shall ensure that the offence is recorded on the Senate Discipline database and that the Registrar and any others are notified of the finding and penalty for immediate implementation. If the Vice-Chair (Academic Administration) and/or the student Senator have any material concerns about the process, the Vice-Chair (Student Affairs) shall consult with the Academic Integrity Officer to determine whether the concerns can be resolved. If the Vice-Chair (Academic Administration) and the Academic Integrity Officer are unable to resolve any concerns, the matter shall be referred back to the Academic Integrity Officer for further consideration under these Procedures, after which the Vice-Chair (Academic Administration) and a student Senator shall jointly re-consider ratification. Should ratification still not occur, the matter shall be referred to the Senate Discipline Committee for a hearing.
14. If the Academic Integrity Officer's assessment is that there is sufficient evidence to support a finding that the student has committed an academic offence, but that the appropriate penalty for the student's conduct is one of those listed in subparagraphs 5 to 9 of paragraph 5 of these Procedures, the Academic Integrity Officer shall, within five working days of the meeting, notify the student in writing, with a copy to the instructor, that the matter will be forwarded to the Senate Discipline Committee for a full hearing.
15. Should a student request that an allegation be referred back to the Academic Integrity Officer after it has been forwarded to the Senate Discipline Committee, the Academic Integrity Officer has the discretion to grant such a request. A student's request shall be in writing and delivered to the Vice-Chair (Student Affairs) within five working days of the date the allegation letter is sent to the student by the Vice-Chair (Student Affairs).
16. Prior to a hearing by the Senate Discipline Committee of an allegation against a student, the Academic Integrity Officer shall provide a written allegation to the Senate office identifying the evidence initially presented by the instructor pursuant to paragraph 6 and any additional evidence obtained by the instructor in the course of the assessment of the matter. The written allegation shall not include reference to whether or not any meeting(s) did occur pursuant to paragraph 8d or 8e, any statements that may have been made by the student at such meeting(s), or any alternate versions of the facts and circumstances that may have been presented by one or more students at such meeting(s). The student shall have the opportunity to provide a written submission in response prior to the hearing by the Senate Discipline Committee. Notwithstanding the foregoing, in the event of a statement made by a student at a hearing of the Senate Discipline Committee that is inconsistent with a statement previously made by that student in the meeting(s) with the Academic Integrity Officer, then the Academic Integrity Officer may refer to statements that may have been made by the student at such meeting(s).
17. Confidentiality must be maintained by those involved in each case when an academic offence is suspected and the instructor submits an allegation to the Academic Integrity Officer, except as is reasonably necessary to implement the finding and agreed penalty or as required in subsequent disciplinary proceedings related to the same matter.

## Senate Discipline Committee

### Commentary on Penalties

#### *A. Proactive Measures*

Dalhousie University emphasizes education and proactive engagement, therefore a Proactive Measure, which is a form of recommendation, may be prescribed as an educational aid in addition to a Penalty. It may include but not necessarily be restricted to suggesting that the student seek some form of professional help from the Advising and Access Services Centre or Counseling Services or elsewhere which, for example may be time management or stress management, etc., and/or an apology for the infraction. The main purpose of a Proactive Measure is to help the student learn how to reduce the likelihood of future violations of academic integrity. It is important to note that it is the student's responsibility to decide whether or not to follow the Proactive Measure since it is not a formal Penalty but rather a recommendation. Therefore, there is normally no oversight by the University (AIO or SDC) to ensure that a Proactive Measure is followed.

#### *B. Consequence*

A Consequence is an outcome of the application of a Penalty. A Consequence is not imposed by the University's academic integrity policies but arises from the University's academic policies. For example, the consequences of the Penalty of a failing grade may include but not necessarily be limited to failure in a program, delay of graduation, loss of full-time student status, change in visa

status (for a visa student), loss of eligibility for student aid, removal from the Dean's list. Similarly, a notation on a transcript may have serious unforeseen consequences for future opportunities, etc. This list is not intended to be exhaustive. Therefore, while the university's academic integrity procedures (AIO or SDC) may foresee some consequences, ultimately the student bears the responsibility for any consequences of a Penalty.

## Senate Discipline Committee

### *Jurisdiction of the Senate Discipline Committee*

1. The Senate Discipline Committee has jurisdiction to hear:
  - a) Complaints referred to the Senate Discipline Committee under the Code of Student Conduct ("Code Complaints"); and
  - b) Allegations of academic offences referred to the Senate Discipline Committee under the Faculty Discipline Procedures Concerning Allegations of Academic Offences ("Integrity Allegations").
1. For the purpose of these procedures, the following definitions shall apply:
  - a) **Allegation** means a Code Complaint or an Integrity Allegation as the context requires.
  - b) **University Representative** means the President of the University or their designate in the case of Code Complaints, or the Academic Integrity Officer in the case of Integrity Allegations.
1. The Senate Discipline Committee's jurisdiction extends to Allegations against a student who, before or during the course of the disciplinary process involving the student, but prior to adjudication, has:
  - i) been compelled to withdraw academically;
  - ii) chosen to withdraw from the course, the program, or the University prior to being disciplined, or;
  - iii) chosen not to register at the University.
1. In the case of Integrity Allegations, a Hearing Panel of the Senate Discipline Committee may:
  - a) dismiss the allegation; or
  - b) impose any of the following:
    - i) notation of the fact of discipline on the offender's transcript for a period of one or more years, but not exceeding five years;
    - ii) repeat of the assignment that triggered the discipline;
    - iii) a failing grade or mark or assessment in the piece of work triggering the discipline;
    - iv) an imposed limit on the grade that can be given for the assignment or course;
    - v) failure of the course;
    - vi) suspension for an academic term or year (to a maximum suspension of three academic years);
    - vii) expulsion from the University;
    - viii) any other remedy of an academic nature that is within the power of Senate to grant.
1. In the case of a Code Complaint, a Hearing Panel of the Senate Discipline Committee may:
  - a) dismiss the complaint; or
  - b) impose any of the penalties set out under the Code of Student Conduct
1. In the case where an Allegation is proven and is not dismissed under section 4(a) or 5(a), the Hearing Panel of the Senate Discipline Committee may consider any mitigating or aggravating circumstances in its determination of the appropriate penalty.

### *Initiating a Hearing/Pre-Hearing Procedures*

1. To initiate a hearing of the Senate Discipline Committee the University Representative shall submit a written request to the Senate Vice-Chair (Student Affairs) or designate. The request shall include a written submission outlining the Allegation together with all supporting evidence, documentation, and a list of the witnesses on which the University Representative intends to rely.
2. The Senate Vice-Chair (Student Affairs) shall provide the student with a notice of the Allegation that shall include:
  - a) The material filed by the University Representative under section 7;
  - b) Notice of the deadline for the student to submit a written defence, any supporting evidence and a list of individuals who will attend at the hearing on the student's behalf; and
  - c) Notification of the student's right to be represented.
1. The student shall provide the Senate Vice-Chair (Student Affairs) with a written defence, supporting evidence and a list of the individuals who will also be attending, as well as their capacity (e.g., witness, support person, advocate) no later than the date specified in the notice of allegation. Any evidence or documentation provided after the deadline for submission may be ruled inadmissible by the Hearing Panel at the hearing.
2. The Chair of the Senate Discipline Committee shall constitute a Hearing Panel in a timely manner comprising three faculty and two students. No faculty member who is a current instructor of the accused student may serve as a member of the Hearing Panel. The student member of a Hearing Panel shall not be a member of the course from which the complaint originates. In the event that no student members of the Committee are able to participate on a Hearing Panel due to the provisions of this paragraph, the Dalhousie Student Union shall appoint an ad hoc member to the applicable Hearing Panel. The Committee Chair or an alternate faculty member shall chair the hearing.
3. The Student and University Representative shall be notified of the date, time, and location of the hearing, as well as the names of all individuals who will be in attendance, no less than 10 working days in advance of the hearing.
4. Preliminary objections or issues must be raised as far in advance of the hearing as reasonably possible. The Chair of the Hearing Panel has sole discretion to rule on any preliminary issues or objections raised by either party that must be dealt with prior to the commencement of the hearing. The Hearing Panel may rule on any preliminary issues or objections raised at the commencement of the hearing.

### ***Hearing Procedures***

1. The Chair of the Hearing Panel shall determine procedures for the hearing in a manner that is consistent with the principles of natural justice and these Procedures.
2. In extenuating circumstances, the Chair of the Hearing Panel may decide to proceed with the hearing in the absence of one faculty member of the Hearing Panel.
3. In the event that the student fails to appear at the hearing, the Hearing Panel shall satisfy itself that reasonable efforts were made to notify the student and may proceed in the student's absence.
4. The student may participate at an oral hearing in person, by way of teleconference, or by such other means approved in advance by the Hearing Panel. The student may waive the right to an oral hearing and choose to proceed solely by written submissions.
5. Hearings shall be in camera.

6. At the commencement of the hearing, the Chair of the Hearing Panel shall explain the procedures to be followed and provide an opportunity for introductions as well as any questions, objections, or opening statements.
7. The University Representative shall present the Allegation and witnesses, if any. The student and any members of the Hearing Panel may question the University Representative and the University Representative's witnesses following the presentation of the Allegation.
8. The student may present their defence and witnesses, if any, following the University Representative's presentation. The University Representative and any members of the Hearing Panel may question the student and any of the student's witnesses following the presentation of the defence.
9. At the discretion of the Chair of the Hearing Panel, the parties may make final arguments following the presentations. The student shall have the last word.
10. At the discretion of the Hearing Panel, any evidence sought to be admitted by either party from witnesses who are not available to give evidence in person may be received in writing or in some other form.
11. The student is considered innocent until the Allegation is proven on a balance of probabilities, the burden of which lies with the University Representative.
12. The decision of the Hearing Panel shall be by majority.
13. The Hearing Panel shall report its decision including reasons for the decision and any penalty imposed, to the Vice-Chair (Student Affairs) who shall forward a copy of the decision to the student and the University Representative.
14. An audio recording of each oral hearing shall be made. The recording and all correspondence and documentary evidence relating to appeal proceedings shall be kept in accordance with the records management policies of the University Secretariat. The student may obtain a copy of the audio recording by making written request to the Senate Vice-Chair (Student Affairs) and may use such recording only for the purpose of an appeal of the decision in question.
15. Appeals from decisions of the Senate Discipline Committee may be made to the Senate Appeals Committee in accordance with the Senate Appeals Committee - Jurisdiction and Appeals Procedures.
16. The Senate shall maintain a confidential database of discipline decisions for the purposes of general reporting and proper adjudication of repeat offences.

### ***University of King's College***

The University of King's College Registrar shall notify the Dalhousie Registrar in the event that academic discipline proceedings have been commenced in relation to a Dalhousie student, and shall advise the Dalhousie Registrar of the outcome of such proceedings, including any sanctions imposed against the student. Where the student has been previously sanctioned for academic misconduct, the Dalhousie Registrar will provide the University of King's College Registrar with particulars of the offence and the sanction imposed.

## **Code of Student Conduct**

### **I. Background**

Dalhousie University is a community of faculty, staff, and students, involved in teaching, research, learning and other activities. Students are members of the University for the period of their registration in an academic program and are subject to the disciplinary authority of the University during that time.

The University does not stand in loco parentis to its students. In the exercise of its disciplinary authority, the University treats students as adults free to organize their own personal lives, behaviour, and associations subject only to the law, and to University regulations that are necessary to protect:

- the integrity and proper functioning of the academic and non-academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;
- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members.

Other than this, regulation of student behaviour by the University is neither necessary nor appropriate.

Members of the University, including students, are not immune from the criminal and civil law. Provisions for non-academic discipline should not attempt to shelter students from the normal responsibilities of adult citizens nor add unnecessarily to these responsibilities. Thus, conduct that violates the Criminal Code or other statute should ordinarily be dealt with by the police and criminal courts. In cases, however, in which criminal or civil proceedings would not adequately protect the University's interest and responsibilities as defined above, proceedings may be brought under the Code of Student Conduct.

The University may also define standards of professional conduct for students in programs where these are appropriate, and this Code is not intended to replace or supersede such standards.

## **II. Code of Conduct**

### **A. DEFINITIONS**

1. In this Code, the word "premises" includes lands, buildings and grounds of the University, or other places or facilities used for the provision of the University's programs or services or for University-approved events and activities.
2. In this Code, "student" means a person:
  - (i) engaged in any academic work or placement which leads to the recording and/or issue of a mark, grade or statement of performance by the appropriate authority in the University or another institution; and/or
  - (ii) registered in, enrolled in, or attending any course or class, or otherwise participating as a learner in any activity which entitles the person to the use of a University library, library materials, library resources, computer facility or dataset.
3. In this Code, the words "Dalhousie University" refer to Dalhousie University and include any institutions affiliated with it, where such inclusion has been agreed upon by the University and the affiliated institution, with respect to the premises, facilities, equipment, services, activities, students, and other members of the affiliated institution.
4. Unless otherwise stated, a student will only be liable for conduct that the student knew or ought reasonably to have known would constitute conduct prohibited under this Code.
5. Nothing in this Code shall be construed to prohibit peaceful assemblies and demonstrations, or lawful picketing, or to inhibit freedom of speech.

### **B. APPLICATION**

Conduct shall be deemed to be an offence under this Code, when committed by a student of Dalhousie University, provided that such conduct:

- (a) occurs on the premises of Dalhousie University;
- (b) occurs elsewhere in the course of activities sponsored by Dalhousie University (or by any of its faculties, schools, or departments), or where the conduct is alleged to adversely affect, disrupt, or interfere with another person's reasonable participation in Dalhousie University programs or activities; or
- (c) occurs in the context of a relationship between the student and a third party and involves the student's standing, status, or academic record at the University.

However, this Code will not apply to conduct that:

- (i) is specifically assigned to another disciplinary body within the University; or
- (ii) is subject to action as an alleged failure to meet standards of professional conduct as required by a college, faculty, or school; or
- (iii) is subject to action under a residence discipline policy unless some non-residence University interests are deemed to be involved, in which case the President may specifically authorize proceedings under this Code; or
- (iv) is committed by a student in their capacity as an employee of the University unless some non-employment University interests are deemed to be involved, in which case the President may specifically authorize proceedings under this Code;
- (v) is subject to the disciplinary authority of the Dalhousie Student Union.

## C. OFFENCES

### 1. Offences Against Persons

- (a) No student shall otherwise assault another person, threaten any other person with bodily harm, or cause any other person to fear bodily harm.
- (b) No student shall create a condition that unnecessarily endangers the health or safety of other persons.
- (c) No student shall threaten any other person with damage to such person's property, or cause any other person to fear damage to their property.
- (d) No student shall engage in a course of vexatious conduct, harassment or discrimination that is directed at one or more specific persons and that is based on the age, race, colour, religion, creed, sex, sexual orientation, physical disability, mental disability, an irrational fear of contracting an illness or disease, ethnic or national or aboriginal origin, family status, marital status, source of income, political belief or affiliation or activity of that person or of those with whom that person associates.
- (e) No student shall engage in unwelcome or persistent conduct that the student knows, or ought to reasonably know, would cause another person to feel demeaned, intimidated or harassed. Examples of such conduct include, but are not limited to:
  - (i) following another person, or anyone known to that person;
  - (ii) unwanted communication with another person or anyone known to that person;
  - (iii) watching the residence or place of work of another person or anyone known to that person;
  - (iv) threatening another person or any member of the family, friends or colleagues of the other person;
  - (v) coercing, enticing or inciting a person to commit an act that is humiliating or demeaning to that other person or to others.

### 2. Disruption

No student shall, by action, threat or otherwise, disrupt, obstruct, or adversely affect any activity organized by Dalhousie University or by any of its faculties, schools or departments, or the right of other persons to carry on their legitimate activities, to speak or to associate with others.

### 3. Offences Involving Property

- (a) No student shall take without authorization, misuse, destroy, deface, or damage the property of Dalhousie University, or property that is not their own, or information or intellectual property belonging to Dalhousie University or to any of its members. (b) No student shall possess the property of Dalhousie University, property in the custody of Dalhousie University, or property that is not their own, if the student knows that property to have been taken without authorization.
- (c) No student shall create a condition that unnecessarily endangers or threatens destruction of the property of Dalhousie University or of any of its members.

### 4. Unauthorized Use of University Facilities, Equipment or Services

- (a) No student shall use any facility, equipment or service of the University, or enter or remain on any premises, to which the student does not have legitimate access, or contrary to the expressed instruction of authorized persons.
- (b) No student shall use any University computing equipment, facility, network or system for any disruptive or unauthorized purpose, or in a manner that violates any law, Dalhousie University regulations, policies and procedures or in any way that is incompatible with the principles in the Guide to Responsible Computing. Examples of inappropriate use of computer equipment, facilities, networks and systems include, but are not limited to:
  - (i) copying, removing or distributing software and/or data without authorization;
  - (ii) using another person's account, or misrepresenting themselves as another user;

- (iii) disclosing confidential passwords, access codes, etc., assigned to themselves or others;
- (iv) interfering with the work of others using computing equipment, facilities, networks, systems or accounts;
- (v) displaying, transmitting, distributing or making available information that is discriminatory, obscene, abusive, derogatory, harassing or otherwise objectionable;
- (vi) breaching terms and conditions of software licensing agreements;
- (vii) interfering with the normal operation of computing equipment, facilities, networks or systems by, among other things, flooding the network with messages, sending chain letters or pyramid solicitations;
- (viii) using the University's computing equipment, facilities, networks and systems for profit or commercial gain.
- (c) No student shall destroy, misplace, misfile, or render inoperable any stored information such as books, film, data files or programs from a library, computer or other information storage, processing, or retrieval system.
- 5. **Aiding in the Commission of an Offence**  
No student shall encourage or aid another student in the commission of an offence defined in this Code or encourage or aid behaviour by a non-student which, if committed by a student, would be an offence under this Code.
- 6. **Alcohol and Drug Use**  
No student shall contravene the Liquor License Act of Nova Scotia or a provision of the Campus Alcohol Policy, nor shall any student possess, use, or sell a drug to which access is restricted by the Narcotics Control Act.
- 7. **False Information and Identification**
  - (a) No student shall knowingly furnish false information to any person or office acting on behalf of the University.
  - (b) No student shall forge, alter, or misuse any document, record, or instrument of identification.
  - (c) No student shall knowingly furnish false information to any person regarding their standing, status, or academic record at Dalhousie University.
- 8. **Unauthorized Possession of a Firearm or Weapon**  
No student shall possess a firearm or other weapon on the University premises without the specific written permission of the Chief of Security.
- 9. **Contravention of University Regulations**  
When a rule, regulation or policy of the University prohibits or proscribes certain conduct but does not provide any penalty for breaches of the rule, regulation or policy, breaches shall be dealt with under this Code.
- 10. **Other**  
No student shall contravene any provision of the Criminal Code or any other federal, provincial, or municipal statute on the premises of the University or in the course of the University's programs or services, or University-approved events or activities.

## D. PROCEDURES

1. Any person may make a complaint under this Code against any student for misconduct. A complaint must be addressed in writing to Vice-Provost, Student Affairs and shall contain:
  - a. the basis for the allegation;
  - b. relevant supporting documents, evidence, and details (e.g., time and date(s) of the offence);
  - c. any other individual(s) with knowledge; and
  - d. names of witnesses, if any.
2. Whenever possible and appropriate, reasonable, and informal measures shall be used to resolve issues of individual behaviour. The Vice-Provost, Student Affairs, or designate, may recommend to a complainant that other avenues of resolution be pursued before resort is made to formal disciplinary measures pursuant to this Code.
3. All complaints shall be submitted within 30 calendar days of the date that the offence is alleged to have occurred. An extension of time to submit a complaint may be permitted by the Vice-Provost, Student Affairs, or designate, where there is a *bona fide* reason to do so and where those affected by the allegation will not be unduly prejudiced.
4. Upon receipt of a complaint, the Vice-Provost, Student Affairs, or designate shall determine whether or not the complaint has been properly brought under the Code or whether the material supports a *prima facie* case that an offence has been committed under the Code. The Vice-Provost, Student Affairs, or designate, may request more information from the complainant before any further steps are taken. If no *prima facie* case is made out, no further steps are taken in relation to the complaint, and the complainant will be so advised in writing.
5. In the event that the Vice-Provost, Student Affairs, or designate, determines that the material supports a *prima facie* case, the following steps shall be taken:
  - a. The Vice-Provost, Student Affairs, or designate shall inform the respondent in writing of the nature of the allegation, the complaint, the evidence, the procedures to be followed, the possible penalties, and possible sources of advice and



support. Along with notice of the complaint, the respondent shall be advised of their right to be represented throughout the process, including by a Student Advocate.

- b. If deemed necessary, an investigation will be conducted by the Vice-Provost, Student Affairs, or designate, which may include meetings with the complainant, respondent, and witnesses.
  - c. The Vice-Provost, Student Affairs, or designate shall convene a meeting with the respondent(s) to discuss the complaint and their response to the allegations.
6. Where there are criminal or civil proceedings pending against the student for conduct related to the complaint, the Vice-Provost, Student Affairs may defer investigation of the complaint on such terms and conditions as are appropriate in the circumstances (including an interim suspension) until the conclusion of all or part of such proceedings where the circumstances of the case warrant. Conviction of a criminal offence will be considered prima facie evidence of a parallel offence under this Code.
  7. Following the investigation, the Vice-Provost, Student Affairs, or designate shall determine whether there is sufficient evidence to support a finding that the student has committed an offence, and if so, will determine which disposition will be most appropriate in the circumstances:
    - a. Informal Resolution (resolution of the complaint is mutually agreed upon among the Vice-Provost, Student Affairs, or designate, the complainant and the respondent); or
    - b. Referral to the Senate Discipline Committee for a disciplinary hearing.
  8. If an informal disposition of the complaint results, such disposition shall be final, and there shall be no subsequent proceedings. An agreement that a student will voluntarily withdraw from the University for a period of time, or not re-register, may be part of an informal resolution of a complaint. In such instances, this will not be recorded on the student's academic record, but a 'block' on further registration may be imposed.
  9. Where the parties attempt to resolve the complaint through an informal resolution, but in the opinion of Vice-Provost, Student Affairs, or designate, an informal resolution cannot be reached, the Vice-Provost, Student Affairs, or designate, shall refer the complaint to the Senate Discipline Committee for a formal hearing.
  10. Notwithstanding paragraph 7, the Vice-Provost, Student Affairs, or designate, may determine at any time that the case is serious enough that a suspension or expulsion may be required, in which case the matter shall be referred to the Senate Discipline Committee for a disciplinary hearing (See Section E – Sanctions). The Vice-Provost, Student Affairs, or designate, shall notify the student in writing, with a copy to the complainant, that the matter will be forwarded to the Senate Discipline Committee.
  11. Hearings conducted by the Senate Discipline Committee shall be according to procedures determined by the Committee. The President, or designate, shall appoint a University Representative to present the complaint.
  12. Any statements a respondent makes to the Vice-Provost, Student Affairs, or designate in the course of an attempt to resolve a complaint through informal or formal dispositions may not be submitted to the Senate Discipline Committee as evidence in a subsequent hearing.
  13. The Vice-Provost, Student Affairs, shall report annually to Senate regarding the number and nature of all complaints, including the manner in which they are disposed of or resolved.

## **E. SANCTIONS**

1. In each case in which the Senate Discipline Committee determines that a student has violated this Code, the sanction(s) shall be determined and imposed by the Committee.
2. The following sanctions may be imposed upon any student found to have violated this Code:
  - a. Warning – A notice in writing to the student that the student is violating or has violated institutional regulations.
  - b. Probation – A written reprimand for violation of specified regulations. Probation is for a designated period of time and includes the probability of more severe disciplinary sanctions if the student is found to be violating any institutional regulation(s) during the probationary period.
  - c. Loss of Privileges – Denial of specified privileges for a designated period of time.
  - d. Restitution – Compensation for loss, damage, or injury. This may take the form of appropriate service and/or monetary or material replacement.
  - e. Discretionary Sanctions – Work assignments, service to the University or other such discretionary assignments that are considered appropriate.
  - f. Conditions – Conditions may be imposed upon a student's continued attendance.
  - g. University Suspension – Suspension of the student from the University for a specified period of time, after which the student is eligible to return. Conditions for readmission may be specified.
  - h. University Expulsion – Permanent separation of the student from the University.

## **F. INTERIM SUSPENSION**

In the following circumstances, the President of the University, or a designate, may impose an interim suspension prior to the hearing before the Committee.

1. Interim suspension may be imposed only: (a) to ensure the safety and well-being of members of the University community or preservation of University property; (b) to ensure the student's own physical or emotional safety and well-being; or (c) if the student poses a threat of disruption or of interference with the operations of the University or the activities of its members.
2. During the interim suspension, students may be denied access to specified campus facilities (including classes) and/or any other University activities or privileges for which the student might otherwise be eligible, as the President or the designate may determine to be appropriate.
3. A student who is the subject of an interim suspension may request a hearing before the Senate Discipline Committee on the issue of the interim suspension itself. This request shall be submitted in writing, with reasons, to the Secretary of Senate. The Committee shall hear the matter, including submissions by the President or designate, within ten working days, and shall have the authority to confirm, negate, or alter the terms of the interim suspension.

## Protection of Property

1. Dalhousie University is the owner and/or occupier of the lands and buildings which comprise its campuses. In addition to all other processes set out in this Calendar (including the Code of Student conduct), the University reserves the right to exercise all rights and remedies available to it pursuant to any statute, by-law, regulation, ordinance, order, or otherwise, in order to protect campus property and those who use it.
2. Without limiting the foregoing, Dalhousie University may issue a notice against a student pursuant to the *Protection of Property Act* prohibiting entry to all or part of the campuses or prohibiting a particular activity or activities on all or part of the campuses, where circumstances warrant. Such a notice may be issued either separately or in conjunction with the procedures set out in the Code of Student Conduct. The notice may be in force for the period stated in the notice which will normally be for up to one calendar year. If considered appropriate by the Vice-Provost, Student Affairs, a notice may be renewed for further periods.
3. A notice under the *Protection of Property Act* may also be issued by Dalhousie University in relation to the Student Union Building at the request of the Student Union. In the case of urgent or emergency situations, such a notice may be issued immediately. If the Student Union request is to have a prohibition extend beyond seven days for a registered Dalhousie University student, the Student Union shall make a written request to the Vice-Provost, Student Affairs, providing detailed reasons for the request and the process followed leading up to the request for the notice, including details of when the student was advised that their behaviour or activities were inappropriate and ought to cease, the reasons provided to the student, and whether the student was afforded the opportunity to respond or to rectify behaviors or cease the inappropriate activity.
4. A Dalhousie University student may appeal any notice issued against them under the *Protection of Property Act* in writing to the Vice-Provost, Student Affairs.

## Hazing Policy

### A. Background & Purpose

Members of the University community share values that are at the center of campus life. Members of the University community are expected to aspire to the highest standards of campus community life based on common principles, including:

- Community
- Respect
- Accountability
- Diversity
- Safety

To help ensure the best possible student experience, University community members share the responsibility for welcoming and orienting new members of the University community in a positive way.

The purpose of this Policy is to identify activities that breach generally accepted standards of conduct when participating in student group activities and provide a process for dealing with allegations of Hazing in an appropriate and timely manner.

## B. Application

This Policy applies to participation in Hazing by a member of the University community that occurs:

- (a) on the premises of Dalhousie;
- (b) off of Dalhousie premises in the course of activities sponsored by Dalhousie (or any of its Faculties, Schools, Departments, or administrative units) or the Dalhousie Student Union or Dalhousie Student Union societies; or
- (c) where the conduct is alleged to adversely affect, disrupt, or interfere with a student's reasonable participation in Dalhousie programs or activities.

## C. Definitions

1. In this Policy:
  - a. "Complainant" means an individual who makes an allegation of Hazing under this Policy.
  - b. "Respondent" means an individual against whom an allegation of Hazing is directed or who becomes the subject of an investigation. Respondents may include individuals who planned, implemented or participated (actively, passively or as a bystander) in Hazing.
  - c. "Hazing" means any activity expected of a student wishing to join a group (or of a student wishing to gain or maintain full status in a group) which humiliates, degrades, abuses, endangers, or subordinates that student, regardless of the student's apparent willingness to engage in the activity.
  - d. "Student Leaders" means students involved in a leadership position with a group, which students are not acting as Employees of Dalhousie
  - e. "Employee(s)" means any person employed by the University and may include students.
  - f. "Restorative process" refers to processes designed to create meaningful reflection and interaction between respondents and complainants (or others impacted by a Hazing incident) for educational and healing purposes. Use of restorative processes does not preclude other remedies or sanctions.
  - g. "Unit Head" means:
    - a. For Varsity Athletics, the Athletics Director.
    - b. For residences, the applicable Residence Life Manager.
    - c. For Dalhousie Student Union societies and clubs, the Vice President (Internal) of the Dalhousie Student Union.
    - d. For intramurals and clubs, the Student Life Manager.
    - e. For academic student activities, the Dean of the Faculty connected with the impugned activity.
    - f. For all other student activities not specifically addressed in this definition, the Executive Director, Student Life.

## D. Policy

1. No member of the University community shall be involved in planning, implementing, or participating (actively, passively or as a bystander) in Hazing.
2. It is no defence to an allegation of Hazing that:
  - a. Express or implied consent of the student was obtained, or participation was voluntary;
  - b. The conduct or activity was not part of an official group or was otherwise sanctioned or approved; or
  - c. The conduct was not an explicit condition or affiliation of membership with the organization or group.
3. Where a member of the University community has reasonable grounds to believe that Hazing is occurring or has occurred, the member is under a positive obligation to take all reasonable steps to stop the Hazing and report Hazing promptly under this Policy.
4. All members of the University community shall cooperate in any investigation process initiated under this Policy.
5. There will be no retaliation against any person on account of an allegation or an expressed intention to make an allegation under this Policy or on account of evidence or assistance given in relation to a proposed allegation under this Policy. Disciplinary action in response to retaliation will be addressed in accordance with applicable disciplinary processes.
6. Any communication or information gathered in any case is confidential except to the extent that disclosure is necessary to effectively implement this Policy or to undertake any disciplinary or remedial steps arising from a decision made under this Policy. Disciplinary action in response to a breach of confidentiality will be addressed in accordance with applicable disciplinary processes.

7. An allegation made in bad faith (with a conscious design to mislead or deceive, or with a malicious or fraudulent intent) may constitute grounds for disciplinary action against the Complainant, which will be addressed in accordance with applicable disciplinary processes.
8. All allegations of Hazing shall be reported in accordance with the terms of this Policy.

## E. Administrative Structure

1. Authority: This Policy falls under the authority of the Provost.
2. Executive Director, Student Life: The Executive Director, Student Life is responsible for promoting the objectives of this Policy, receiving allegations of Hazing, and determining the appropriate process for investigating allegations of Hazing.
3. Hazing Allegation Investigators: There shall be three Hazing Allegation Investigators who shall be responsible for conducting investigations into allegations of Hazing referred to the Investigation Committee. All Hazing Allegation Investigators shall be appointed by the Vice-Provost, Student Affairs. The Hazing Allegation Investigators shall include the Manager of Student Conflict Resolution, a representative from Security Services and an individual not from those offices who has investigative experience.
4. Hazing Committee: There shall be a Hazing Committee comprising the three Hazing Allegation Investigators, the Executive Director, Student Life, the Manager of Student Conflict Resolution, a representative from Security Services and a representative from Legal Counsel Office who shall meet at least once a year to discuss any issues arising out of this Policy.
5. Conflicts of Interest: Where the Vice-Provost, Student Affairs is unable to discharge their responsibilities under this Policy in relation to a particular allegation due to a potential conflict of interest, as defined by the University Policy on Conflict of Interest, their responsibilities under this Policy shall be assigned to the Vice-President Academic or designate. Where the Executive Director, Student Life is unable to deal with an allegation of Hazing, their responsibility under this Policy for the purpose of the allegation in question shall be assigned to the Vice-Provost, Student Affairs.
6. Record-keeping: Records of all allegations, investigations, and decisions made under this Policy will be kept separate from all other university records and will be maintained and stored securely and confidentially under the care and control of the Executive Director, Student Life.
7. Annual Reporting to the Vice-Provost, Student Affairs: At the end of each academic year, the Executive Director, Student Life will deliver an annual report to the Vice-Provost, Student Affairs which will include
  - a. The number of allegations received under this Policy;
  - b. A representation of the allegations by kind of outcomes (e.g., dismissal of allegations, departmental resolution, investigation through Code of Student Conduct, etc.);
  - c. A representation of the outcomes applied as a result of a finding of Hazing.

## F.1 Reporting Procedures

1. Safe Reporting: There may be exceptional situations where an individual has a reasonable concern that their personal safety may be compromised by raising an allegation of Hazing. Such persons may initiate a confidential conversation with the Executive Director, Student Life or submit an anonymous written allegation to the Executive Director, Student Life. Where considered appropriate, the Executive Director, Student Life may accept unwritten anonymous complaints in a form the Executive Director, Student Life, deems appropriate. Whether or not an anonymous allegation can proceed in the absence of an identified Complainant will be determined by the Executive Director, Student Life, in their sole discretion, having regard to all of the circumstances of the case and the evidence available. If the individual does not feel safe reporting to the Executive Director, Student life they may file an allegation through the Office of Human Rights and Equity Services.
2. Confidential Consultation: If a person is uncertain whether an activity or activities constitute Hazing, that person may contact the Executive Director, Student Life to discuss the matter on a confidential basis.
3. Who may make allegations? Allegations of Hazing may be made by any member of the University community who has reasonable grounds to suspect that Hazing is occurring or has occurred.
4. Filing Allegations of Hazing: Other than complaints arising from Varsity Athletics as set out in Section F.2 of this Policy, allegations of Hazing must be made in writing to the Executive Director, Student Life as promptly as possible upon becoming aware of the alleged Hazing. Allegations should include supporting documentation and information where available.
5. Process advice: The Executive Director, Student Life will provide any Complainant with a copy of this Policy and will explain the processes for dealing with allegations under this Policy.
6. Initial Assessment: Within 10 business days of receipt of the allegation, the Executive Director, Student Life shall make an initial assessment of the allegation. The Executive Director, Student Life may request further information from the

- Complainant or others if required to assist in the assessment. The Executive Director, Student Life may:
- a. Conclude that the allegation does not establish sufficient evidence to warrant further consideration and advise the Complainant that the matter will be discontinued.
  - b. Conclude that there is sufficient evidence of possible Hazing to warrant further consideration; or
  - c. Conclude that the allegation(s) may raise an issue of illegal activity and notify the appropriate authorities.
7. Process Determination: In the event the Executive Director, Student Life concludes that there is sufficient evidence of possible Hazing to warrant further consideration they will refer the matter to one of the following processes:
- a. Allegations shall be referred to the Unit Head in accordance with the terms of this Policy where the alleged Hazing involved no more than one Respondent and where the remedies and sanctions available to a Unit Head are sufficient for a reasonable resolution given the impact of the hazing.
  - b. Allegations shall be referred to the Code of Student Conduct in accordance with the terms of this Policy where the alleged Hazing involved no more than two Respondents and where the remedies and sanctions available to a Unit Head are insufficient for a reasonable resolution given the impact of the hazing.
  - c. Allegations shall be referred to the Investigation Committee where the alleged Hazing involved more than two Respondents.
8. Extraordinary Interim Remedies: In extraordinary circumstances, where the Executive Director, Student Life has reasonable basis to believe that evidence necessary to assess the allegation of Hazing will not be appropriately preserved or that there is a risk of significant continuing harm, the Executive Director, Student Life may, with or without notice to the Respondent(s), cause the appropriate administrative officers to locate, collect, inventory and secure all of the relevant original records, or copies if the originals are unavailable, to prevent the loss, alteration or fraudulent creation of records.
9. Extension of Time Limits: Any time limit set out in this Policy may be extended at the discretion of the Executive Director, Student Life where there is a bona fide reason to do so and where those affected by the allegation will not be unduly prejudiced.

## **F.2 Reporting Allegations – Varsity Athletics**

1. Filing of Allegations – Varsity Athletics:
- a. Allegations of Hazing in Varsity Athletics which are reported to the Varsity head coach, or which the Varsity head coach becomes aware of, shall be dealt with in the first instance by that head coach.
  - b. Each allegation of Hazing reported to the head coach shall be reported to the Director, Varsity Athletics and the Executive Director, Student Life, including a report of any restorative, remedial and disciplinary action taken by the head coach. The Director, Varsity Athletics shall determine if the matter needs to be referred to the Executive Director, Student Life for further action under this Policy.
  - c. Varsity athletes shall, in all circumstance, be permitted to report instances of Hazing directly to the Executive Director, Student Life.
  - d. In circumstances where the head coach has already taken action, the Executive Director, Student Life shall determine if further action is required under this Policy.

## **F.3 Procedures for Matters Referred to Unit Heads**

1. Referral to the Unit Head: If the Executive Director, Student Life concludes that there is sufficient evidence of possible Hazing to warrant a referral to the Unit Head for assessment the Executive Director, Student Life shall provide the Respondent with a copy of the Allegation, a copy of this Policy and notice of the Procedures under which the allegation will be investigated. A copy of the notice to the Respondent and the allegation will also be forwarded to the Unit Head.
2. Assessment: Within 10 working days of receipt of the referral the Unit Head will assess the allegation in accordance with the following process:
  - a. The Unit Head will meet with Complainant(s) to give them an opportunity to present their allegation and to identify other relevant information and witnesses;
  - b. The Unit Head will then meet with the Respondent (s), to give them an opportunity to address the allegation and identify relevant information and witnesses.
  - c. The Unit Head may meet with any other individuals whom they deem relevant to the allegation, and may request access to, or production of, records or information that they deem relevant to the assessment.
  - d. The Unit Head will document the information provided in each of the meetings set out in subsections (a), (b) and (c) above.
3. Referral Back to the Executive Director, Student Life: If at any point during the assessment process the Unit Head determines that the allegations of Hazing are more severe than initially anticipated, the Unit Head may, in consultation

with the Executive Director, Student Life, refer the matter back to the Executive Director, Student Life for a re-determination of the appropriate process.

4. **Decision:** The Unit Head shall, having regard to all information received during their assessment of the allegation, make a determination of whether there has been Hazing, and if there has been Hazing, what restorative processes, remedies and/or sanctions will be imposed.
5. **Restorative Process, Remedial Action and Sanctions:** In each case where the Unit Head determines that a student, who is not acting in the student's role as an Employee, has participated in Hazing the Unit Head may impose one or more of the following:
  - a. In conjunction with the advice of the Manager, Student Conflict Resolution, a restorative process to engage respondent(s) in meaningful reflection and action with those impacted by the Hazing incident;
  - b. Temporary removal from a group;
  - c. Temporary loss of access to facilities or support services;
  - d. Participation in educational or remedial programs;
  - e. Community service;
  - f. Any other sanction which does not otherwise permanently impact the individual's privileges.
6. **Employees:** In a case where the Unit Head determines that an Employee, including a student acting in their role as an Employee, has participated in Hazing, the matter shall be referred to Human Resources to be addressed in accordance with applicable employee disciplinary processes.
7. **Communication of Decision:** The Unit Head will report in writing the outcome of the case to the Respondent in ways that appropriately address any privacy and security issues. Where the Complainant has a legitimate interest in the outcome of an investigation, the Unit Head will report in writing to the Complainant in ways that appropriately address any privacy or security concerns.
8. **Reporting of Decisions:** The outcome of each assessment shall be reported to the Executive Director, Student Life, including a report of any sanctions or remedies imposed.

#### **F.4 Procedures for Matters Referred to the Code of Student Conduct**

1. **Referral to Vice-Provost, Student Affairs:** The Executive Director, Student Life shall forward the written allegation to the Vice-President Student Services in accordance with the Code of Student Conduct. Following referral to the Vice-Provost, Student Affairs all issues arising out of the allegation, including appeals, shall be dealt with in accordance with the Code of Student Conduct.

#### **F.5 Procedures for Matters Referred to the Investigation Committee**

1. **Notifying the Respondent:** If the Executive Director, Student Life concludes that there is sufficient evidence of possible Hazing to warrant a referral to the Investigation Committee the Executive Director, Student Life shall provide the Respondent with a copy of the Allegation, a copy of this Policy and notice of the Procedures under which the allegation will be investigated.
2. **Representation:** Respondents may have representation if they choose.
3. **Informal Resolution:** Prior to initiating an investigation, the Executive Director, Student Life will explore the possibility of informal resolution. Attempts at informal resolution may be made at any stage of the process. Any informal resolution shall be with the consensus of the Respondent(s) and, where the Complainant has a legitimate interest in the outcome of an investigation, the Complainant.
4. **Investigation:** If informal resolution is not reached within 10 working days of notifying the Respondent, the Executive Director, Student Life shall initiate an investigation. The investigation shall be concluded (including the delivery of the investigation report set out in section F.5.13) within 60 calendar days of its initiation, in accordance with the following process:
  - a. The Executive Director, Student Life will provide the Respondent(s) 10 working days to provide to the Executive Director, Student Life their written response to the allegation.
  - b. The Executive Director, Student Life will appoint an Investigation Committee comprising two of the Hazing Allegation Investigators.
  - c. The Executive Director, Student Life will provide the Investigation Committee with a copy of the Allegation, the Response, and will provide guidance on the process.
  - d. The Investigation Committee will meet with the Complainant(s) to give them an opportunity to present their allegation and to identify other relevant information and witnesses.
  - e. The Investigation Committee will then meet with the Respondent(s), to give them an opportunity to address the allegation and to identify other relevant information and witnesses.

- f. The Investigation Committee may meet with any other individuals whom they deem relevant to the allegation, and may request access to, or production of, information or records that they deem relevant to the allegation.
- g. The Investigation Committee may meet subsequently with the Complainant(s) and/or the Respondent(s) in light of information they have received in the course of the investigation.
- h. The Investigation Committee will have a note-taker present at all meetings with the Complainant(s), the Respondent(s) or other individuals who are deemed relevant to the allegation.
- i. Each interview will be summarized in writing by the Investigating Committee in the form of an interview report, which will be forwarded to the interviewee for confirmation that the report fairly summarizes the interview. In the event an interviewee believes that the report does not fairly summarize their interview they may provide written comments to the Investigating Committee which must be provided to the Committee within two working days of receiving the report.
5. Investigation Report: The Investigation Committee will review all of the information gathered in the course of the investigation and submit an investigation report to the Executive Director, Student Life that includes:
  - a. A summary of the allegation(s);
  - b. A summary of the response;
  - c. An analysis of the evidence relevant to the matters raised;
  - d. Findings of fact with respect to the allegation(s) together with supporting reasons;
  - e. A determination of whether there has been Hazing;
  - f. Where Hazing is found, an assessment of the severity of the Hazing and a review of any mitigating factors; and
  - g. Where Hazing is found, recommendations on appropriate restorative processes, remedies, and sanctions.
6. Consideration by Vice-Provost, Student Affairs: The Executive Director, Student Life will forward the investigation report to the Vice-Provost, Student Affairs. The Vice-Provost, Student Affairs may request additional information or clarification from the Executive Director, Student Life if necessary, to make a determination.
7. Outcomes:
  - a. The Vice-Provost, Student Affairs shall consider the report and, where a finding of Hazing has been made, make and record a decision as to what sanctions or remedies will be imposed.
  - b. In the event that the Vice-Provost, Student Affairs imposes remedies or sanctions which differ from the recommendations of the Investigation Committee, the Vice-Provost, Student Affairs shall also include in the record a summary of the nature and basis of the Investigation Committee's recommendations and the reason(s) forming the basis for the alternate recommendation.
8. Remedies and Sanctions: In each case where the Vice-Provost, Student Affairs determines that a student, who is not acting in their role as an Employee, has participated in Hazing the Vice-Provost may impose one or more of the sanctions and remedies:
  - a. Suspension of some or all individual or group privileges.
  - b. Placing the group or individuals on non-academic probation for a set period of time.
  - c. Removal from a group, including varsity athletic teams.
  - d. Removal from leadership positions with groups (group executive, team captaincy, etc.).
  - e. Loss of access to facilities or support services.
  - f. Mandatory education sessions for executive and/or members.
  - g. Community service.
  - h. Financial restitution and compensation for any loss, damage or injury.
  - i. Any other sanction which is considered appropriate in the circumstances.
9. Employees: In each case where the Vice-Provost, Student Affairs determines that an Employee, including students who are acting in their role as an Employee, has participated in Hazing the matter shall be referred to Human Resources to be addressed in accordance with the applicable employee disciplinary processes.
10. Communication of Decision: The Vice-Provost, Student Affairs will report in writing the outcome of the case to the Respondent in ways that appropriately address any privacy and security issues. Where the Complainant has a legitimate interest in the outcome of an investigation, the Vice-Provost, Student Affairs will report in writing to the Complainant in ways that appropriately address any privacy or security concerns.

## F.6 Appeals

1. Unit Head Decisions – All decisions of the Unit Head are final and there is no appeal of those decisions.
2. Varsity Head Coach Decisions - All decisions of the Varsity head coaches are final and there is no appeal of those decisions.
3. Vice President Student Services Decisions
  - a. Decisions made by the Vice-Provost; Student Affairs shall be appealable to the Senate Appeals Committee.
  - b. Appeals must be filed within 30 calendar days of the date the student was notified of the decision.

# Senate Appeals Committee

## *Jurisdiction of the Senate Appeals Committee*

1. The Senate Appeals Committee has appellate jurisdiction.
2. The Senate Appeals Committee is not an investigative body.
3. The Senate Appeals Committee does not receive or determine:
  - a) allegations of discrimination, which are addressed under the Statement on Prohibited Discrimination, or
  - b) requests for accommodation, which are addressed under the Accommodation Policy for Students.
4. The Senate Appeals Committee shall consider the following appeals initiated by students:
  - a) Academic appeals from decisions or the refusal to make decisions at the Faculty level regarding academic standards, academic evaluation, academic progression, academic advancement, or the application of other University or Faculty academic regulations.
  - b) Discipline appeals from decisions of the Senate Discipline Committee.
5. An appeal may be initiated on the following grounds:
  - a) the decision under appeal was made without jurisdiction,
  - b) a denial of natural justice, or
  - c) unfairness in the application of the relevant regulations regarding academic standards, academic evaluation, academic progression, academic advancement, or other University or Faculty academic regulations.
6. The Senate Appeals Committee shall not consider appeals:
  - a) by students in an academic appeal who have not exhausted the approved appeal processes of the relevant Faculty,
  - b) by students from the decision of a Faculty regarding professional unsuitability, said appeals falling under the jurisdiction of the Senate Steering Committee,
  - c) by a Faculty or faculty members,
  - d) by applicants for admission to University programs, or
  - e) by applicants for scholarships, awards, or bursaries.
7. A Hearing Panel of the Senate Appeals Committee may:
  - a) dismiss the appeal,
  - b) allow the decision under appeal to stand, despite possible insubstantial procedural errors,
  - c) in an academic appeal, allow the appeal, with an appropriate remedy within the authority of Senate,
  - d) in a discipline appeal, allow the appeal and:
    - a) quash the decision of the Senate Discipline Committee in its entirety,
    - b) re-hear the matter itself, with the consent of the Appellant and the Faculty, or
    - c) direct a re-hearing on the merits by a newly constituted panel of the Senate Discipline Committee, no members of which were on the hearing panel whose decision was under appeal.
8. In an academic appeal, the Hearing Panel shall not conduct a substantive evaluation of the work of a student, but if unfairness in the evaluation procedure is established, the Panel may direct a re-evaluation of the work to be conducted by qualified persons designated by the Panel.

## *Appeals Procedures*

1. An appeal shall be initiated by submitting a written Notice of Appeal to the Senate Vice-Chair (Student Affairs), or designate, containing:
  - a) the name, Banner identification number and mailing address of the Appellant,
  - b) a copy of the decision giving rise to the appeal,
  - c) a description of the matter under appeal,
  - d) the grounds for the appeal, and
  - e) the remedy sought by the Appellant.
2. An academic appeal alleging the refusal to make a decision at the Faculty level shall be submitted with reasonable promptness. All other appeals shall be submitted within 30 calendar days of the date that the decision under appeal was sent to the student. An extension of time to submit an appeal may be permitted by the Senate Vice-Chair (Academic Administration), or designate, if the Appellant establishes reasonable grounds for granting the extension.
3. The parties to an appeal are the student, as Appellant, and the Faculty, as Respondent. In an academic appeal, the Dean of the applicable Faculty shall designate one or more representatives to respond to the appeal. In a discipline appeal, the Academic Integrity Officer of the applicable Faculty, or designate, shall respond to the appeal.



4. Upon receiving notice of an academic appeal, the Senate Vice-Chair (Student Affairs) shall require a statement from the Dean of the applicable Faculty confirming that all appeal processes of the Faculty have been exhausted.
5. For each appeal, the Chair of the Committee shall constitute a Hearing Panel in a timely manner. The Hearing Panel shall consist of four faculty members and one student member of the Committee and shall choose its own Chair. None of the faculty members of a Hearing Panel shall be a member of the Faculty from which the appeal originally emanates or belong to the department or program in which the student is or was enrolled. The student member of a Hearing Panel shall not be a member of the course, department, program, School or College from which the appeal emanates. In the event neither student member of the Committee is able to participate on a Hearing Panel due to the provisions of this paragraph, the Dalhousie Student Union shall appoint an ad hoc member to the applicable Hearing Panel.
6. The Appellant is entitled to an oral hearing, in accordance with the principles of natural justice. The Appellant may participate at an oral hearing in person, or at their expense, by way of teleconference, or by such other means approved in advance by the Hearing Panel. The Appellant may waive the right to an oral hearing and choose to proceed solely by written submissions.
7. Each party is responsible for presenting to the Hearing Panel all relevant evidence and submissions for the Panel to consider in the determination of the appeal. Written submissions are required from each party and shall contain:
  - a) copies of all documents relevant to the appeal,
  - b) supporting arguments,
  - c) a list of all witnesses for that party and a brief description of their anticipated evidence, and
  - d) the decision and any remedy being sought.
8. Written submissions shall be made:
  - a) by the Appellant, within 15 calendar days of the Senate Vice-Chair (Student Affairs) requesting the submission, and
  - b) by the Respondent, within 15 calendar days of receiving the Appellant's submission.
 but these timelines may be extended or abridged by the Senate Vice-Chair (Student Affairs), or designate, in appropriate circumstances.
9. The hearing of each appeal shall be in camera. The Chair of the Hearing Panel shall determine procedures for the hearing in a manner that is consistent with the principles of natural justice and these Procedures. In extenuating circumstances, the Chair of the Hearing Panel may decide to proceed with the hearing in the absence of one faculty member of the Hearing Panel.
10. The decision of the Hearing Panel shall be by majority. The Hearing Panel shall deliver written reasons for its decision to the Senate Vice-Chair (Student Affairs). The decision of the Hearing Panel shall be final and binding on the parties, with no further appeal.
11. An audio recording of each oral hearing shall be made. The recording and all correspondence and documentary evidence relating to appeal proceedings shall be kept for a period of three calendar years from the date of the decision of the Hearing Panel, in accordance with the policy of the University Secretariat.

## **Suspension or Dismissal from a Program on the Grounds of Professional Unsuitability Faculty of Health Professions**

The Faculty of Health, acting through its Faculty Committee on Student Appeals and in consultation with the Directors and Dean, may suspend or terminate a student from a program if the student is judged to be unsuitable for the profession in which they are studying. Because of the nature of the study and practice of the various health professions, which places care givers in a position of special trust, certain impairments, or some types of conduct unbecoming to a member of a health profession may be grounds for suspension or dismissal.

The following list includes examples of behaviors that might indicate unsuitability for the various health professions. The nature of these behaviors is such that, should any of them ever be repeated, grievous harm could be caused to clients. This list should not be considered to be all inclusive:

1. a criminal act (e.g., assault, sexual assault, fraud, and drug trafficking) which according to established Faculty processes was determined to be of such a nature as to bring disrepute to the profession, or by which in the opinion of the Faculty, the student demonstrated poor judgment, lack of integrity or (other) unsuitability for the profession; or evidence that, on the balance of probability, the student had committed such an act;
2. being under the influence of alcohol or drugs while participating in client care, any other professional activity, or any activity related to the practice of the health profession;
3. in accordance with provisions of the Nova Scotia Human Rights Act, the occurrence of a health condition that impairs essential performance required for the health profession;

4. unethical behaviour as specified by the code of ethics/standard of practice of the health profession.

The student's situation will be considered with discretion throughout the investigation of the allegation of unsuitability and these deliberations shall determine whether suspension, dismissal or neither is recommended. The principles of natural justice and due process will be observed in all investigations.

Any member of the University community can bring to the attention of the Director behaviors that are deemed unsuitable. These behaviors will be investigated, and allegations heard.

Appeals will follow the appeal procedure for academic matters within the Faculty of Health notwithstanding that the criteria are different. At the University level, appeals will require formation of an *ad hoc* Senate Committee.

Where the rules of a faculty, such as Health, expressly provide that suitability, fitness, or aptitude for the practice of the profession is a requirement for advancement or graduation, or both, and a Faculty determines that a student should be suspended or dismissed or otherwise should not advance or graduate because of unsuitability for the relevant profession, an appeal from the Faculty decision may be made to an ad-hoc appeal committee established by the Senate Steering Committee. The Ad-hoc Appeal Committee shall:(1) hear an appeal by a student from the decision of a Faculty regarding suitability, fitness, or aptitude for the practice of the relevant profession when: a) the student has exhausted the approved appeal regulations and procedures of the relevant Faculty; and b) the student alleges that there were irregularities or unfairness in the application of the regulations in question. The Ad-hoc Appeal Committee shall not hear appeals: a) by students on a matter involving a requested exemption from the application of Faculty or University regulations or procedures; b) on substantive aspects of a finding of unsuitability.

## Acceptable Use of Information Technology Resources

### A. Purpose

The purpose of this policy is to outline appropriate use of Information Technology Resources owned, leased, controlled and/or operated by the University.

### B. Application

This policy applies to all individuals who have been granted a NetID and/or Banner account by the University.

This policy does not replace other policies, procedures or guidelines concerning the use of specific IT Resources or data management but rather sets out a minimum standard of acceptable use.

### C. Definitions

In this Policy,

"User Account" means a NetID and/or Banner account issued by the University;

"Information Technology Resources", or "IT Resources", means computing equipment, peripherals, facilities, networks or systems owned, leased, controlled or operated by the University, including those purchased through research funds;

"User" means an individual who has been issued a User Account.

### D. Policy

#### 1. Accounts

1.1 Authorized access to IT Resources requires a User Account. User Accounts are non-transferable.

1.2 Users are responsible for any and all uses of their User Account and are expected to take reasonable steps to ensure the security of their User Account.

#### 1. Acceptable Use

2.1 Users shall use IT Resources for authorized purposes only.

2.2 No User shall use IT Resources for any disruptive or unauthorized purpose, or in a manner that violates any law,

University regulations, policies, or procedures. Examples of unacceptable uses of IT Resources include, but are not limited to, the following:

- 2.2.1 using another person's User Account, or misrepresenting themselves as another User;
- 2.2.2 disclosing passwords or other access codes assigned to themselves or others;
- 2.2.3 interfering with the normal operation of IT Resources by, among other things, unauthorized network interception, network traffic, flooding the network with messages, sending chain letters or pyramid solicitations;
- 2.2.4 copying, removing or distributing proprietary software and/or data without authorization;
- 2.2.5 breaching terms and conditions of software licensing agreements;
- 2.2.6 accessing, displaying, transmitting, or otherwise making available information that is discriminatory, obscene, abusive, derogatory, harassing or otherwise objectionable in a university setting;
- 2.2.7 destroying, misplacing, misfiling, or rendering inoperable any stored information on a University administered computer or other information storage, processing or retrieval system;
- 2.2.8 unauthorized use of IT Resources for profit or commercial gain; and
- 2.2.9 attempting to or circumventing security facilities on any system or network.

## 1. Consequences of Unacceptable Use

3.1 If there is reason to suspect that a User has violated this policy, the Assistant Vice-President, Information Technology Services or the Information Security Manager may temporarily revoke or restrict User Account access privileges of any User, pending further investigation by the Information Security Manager

3.2 To aid in the investigation of a suspected violation of this policy, the Information Security Manager may examine a User's User Account information, including, but not limited to, emails, files, and any other material or data connected with the User Account, provided that they obtain the Assistant Vice-President Information Technology Services' prior written approval. If the User in issue works within the Information Technology Services Department, then approval must be obtained from the President

3.3 If the investigation concludes that a violation of this policy has occurred, the Assistant Vice-President Information Technology Services may restrict, suspend, or revoke the User's access to any or all of the University's IT Resources, and may

- 3.3.1 in the case of students, initiate disciplinary proceedings under the Code of Student Conduct;
- 3.3.2 in the case of employees, refer the matter for consideration of discipline in accordance with applicable collective agreements or human resource policies, as appropriate.

## Faculty of Graduate Studies

Location:

Henry Hicks Academic Administration Building

Studley Campus

Room 314

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2485

Fax Number: (902) 494-8797

Email Address: [graduate.studies@dal.ca](mailto:graduate.studies@dal.ca)

Website: [www.dal.ca/grad](http://www.dal.ca/grad)

## Administrative Officers

### Dean

**Leonard, M. L.**, BSc (Guelph), MSc (Carleton), PhD (Ottawa)

### Associate Deans

**Denovan-Wright, E. M.**, BSc, PhD (Dalhousie)

**Donaldson, A.**, BAsC, PhD (Ottawa)

**Admissions and Convocation Officer**

Berrigan, S., BSc (Dalhousie)

**Admissions and Convocation Officer**

Smart, J. P., BA (Calgary), MA (Dalhousie)

**Budget Officer and Administrative Assistant to the Deans**

Therault, S., BComm (Dalhousie)

**Curriculum Developer**

Ho, M., BA (Toronto), MA (Ryerson), PhD (UBC)

**Office and HR Administrator**

Kirk, A., BA (Westminster College)

**Program Officer**

Fraser, N., BSc (Dalhousie)

**Scholarships Liaison Officer**

Power, N., BComm (Saint Mary's)

**Senior Manager, Academic Regulations and Student Services**

Baxter, T.L., BA (University of King's College), MEd (MSVU)

**Senior Manager, Strategy and Communications**

Riley, A., BA (Calgary), MA (Western)

**Faculty Council (2020-2021)*****Faculty Representatives***

Budge, S., Engineering

Chappe, V., Medicine

Currie, T., King's

Fierlbeck, K., Arts & Social Science

Guibault, L., Law

Hamdan, N., Dentistry

Kreplak, L., Science

Macdonald, M., Health

McAllister, M., Computer Science

Parcell, S., Architecture & Planning

Price, G., Agriculture

Robinson, L., IDPhD

Tyedmers, P., Management

***Members-at-Large***

Anini, Y.

Cheng, Z.

Ladouceur, M.

Lauckner, H.

Wunker, E.

***DAGS Representatives***

Bajaj, A.

Khosravi, R.

Yans, A.

***Postdoctoral Fellows Representative***

Monfared, Y.

Monyoncho, E.

### ***Standing Members***

Paon, M., Dalhousie Libraries

Leonard, M., Dean, FGS

Donaldson, A., Associate Dean, FGS

Denovan-Wright, E., Associate Dean, FGS

Stone, S., Chair

Tyedmers, P., Vice-Chair

Kirk, A., (Secretary), FGS Staff

Detailed information about particular programs can be found in the academic unit entries in the subsequent sections of this calendar or obtained from academic unit web or print publications. **It is the responsibility of all graduate students to familiarize themselves with the regulations that govern the conditions of their programs of study at the University.** Except where noted, Faculty of Graduate Studies regulations take precedence over Faculty/academic unit regulations. The Faculty of Graduate Studies regulations are subject to change.

The Faculty of Graduate Studies forms are available on the Faculty of Graduate Studies website at [dal.ca/grad](http://dal.ca/grad). Forms are updated on a regular basis.

## **I. Membership in the Faculty of Graduate Studies**

Membership in the Faculty of Graduate Studies is required to teach graduate courses, serve on supervisory and examining committees and supervise or co-supervise graduate students. The conditions for engagement with graduate programs varies with the type of membership held in FGS.

The following membership categories are available:

- Regular
- Adjunct (Retired)
- Adjunct (FGS)
- Adjunct (Scholar)
- Adjunct (Scholar) for Dalhousie Postdoctoral Researchers

FGS should be notified when members in any of the above categories are no longer associated with a graduate program(s).

Detailed descriptions of the membership categories and application procedures can be found on the [Faculty of Graduate Studies website](#). Please see Section IX “Thesis Supervisors and Supervisory Committees” for the roles that members in different membership categories may play on supervisory committees.

Appointment and continuation of appointments are subject to approval by the Dean of the Faculty of Graduate Studies.

## **II. Graduate Programs**

Graduate programs at Dalhousie University are offered in a variety of research and professional fields at the Diploma, Master’s, and Doctoral level.

### **2.1 Degree Programs**

Academic Units in the Faculty of Graduate Studies offer programs leading to the following degrees and diplomas:

- Doctor of Philosophy (PhD)
- Master of Applied Computer Science (MACSc)
- Master of Applied Science (MASc)
- Master of Architecture (MArch)
- Master of Arts (MA)
- Master of Business Administration (MBA)
- Master of Computer Science (MCSc)
- Master of Development Economics (MDE)

- Master of Digital Innovation (MDI)
- Master of Electronic Commerce (MEC)
- Master of Engineering (MEng)
- Master of Environmental Design Studies (MEDS)
- Master of Environmental Studies (MES)
- Master of Fine Arts (MFA)
- Master of Health Informatics (MHI)
- Master of Health Administration (MHA)
- Master of Information (MI)
- Master of Information Management (MIM)
- Master of Journalism (MJ)
- Master of Laws (LLM)
- Master of Marine Management (MMM)
- Master of Nursing (MN)
- Master of Periodontics (MPerio)
- Master of Planning (MPlan)
- Master of Planning Studies (MPSP)
- Master of Public Administration (MPA)
- Master of Resource and Environmental Management (MREM)
- Master of Science (MSc)
- Master of Social Work (MSW)
- Graduate Diploma in Information Management (GDIM)
- Graduate Diploma in Orthoptics and Ophthalmic Medical Technology (OOMT)
- Graduate Diploma in Public Administration (GDPA)
- Graduate Diploma in Public Administration (Management) (GDPA (M))

#### Combined Degrees:

- Master of Business Administration/Master of Engineering (MBA/MEng)
- Master of Business Administration/Juris Doctor (MBA/JD)
- Master of Health Administration/JD (MHA/JD)
- Master of Health Administration/Master of Nursing (MHA/MN)
- Master of Information/Juris Doctor (MI/JD)
- Master of Information/Master of Public Administration (MI/MPA)
- Master of Information /Master of Resource and Environmental Management (MI/MREM)
- Master of Nursing/Master of Health Administration (MN/MHA)
- Master of Public Administration/Juris Doctor (MPA/JD)
- Doctor of Medicine/Master of Science (Oral and Maxillofacial Surgery) (MD/MSc)

## 2.2 Program Administration

Graduate programs at Dalhousie are administered at the Faculty, academic unit, and program levels.

The graduate coordinator of each program acts as the principle liaison between the unit/program and the Faculty of Graduate Studies.

## 2.3 Program Definitions and Fee Requirements

At Dalhousie, the academic year for graduate studies is divided into three terms: Fall (September-December), Winter (January-April), and Summer (May-August). Graduate degree programs are based either on a program fee structure or a per-course fee structure.

Fee schedule can be found on the Student Account's website at [dal.ca/moneymatters](http://dal.ca/moneymatters).

#### Program Fee Degrees

Program fee degrees have a pre-determined tuition fee each term, and typically have a set number of terms over which a student is required to pay those fees. Students are expected to maintain continuous registration in program-fee degrees at Dalhousie even when given permission to take courses or undertake research elsewhere. Some Masters programs require students to pay their program fees over two terms rather than three. Students who complete their degree requirements prior to paying the required

number of terms of program fees will be required to pay the remaining balance to be approved for convocation.

Master's students continuing beyond their initial program fee requirement period will be assessed continuing fees on a per-term basis. Doctoral students are required to pay full program fees for the duration of their degree.

Students entering or switching to a part-time Master's program are required to pay the part-time equivalent of full-time program fees. Three terms of part-time fees are typically considered equivalent to one term of full-time fees. There are no part-time PhD programs at Dalhousie.

**It should be noted that under program or continuing fees, students may take only the courses approved by their academic unit and recorded in the Graduate Student Information System (GSIS). If courses are not approved as part of degree requirements, additional fees will apply.**

Program fee students include those in the following programs:

- Doctor of Philosophy
- Master of Applied Science
- Master of Architecture (Post-Professional)
- Master of Arts
- Master of Business Administration (Corporate Residency)
- Master of Computer Science
- Master of Development Economics
- Master of Electronic Commerce
- Master of Engineering
- Master of Environmental Design Studies
- Master of Environmental Studies
- Master of Fine Arts
- Master of Health Informatics
- Master of Laws
- Master of Marine Management
- Master of Nursing
- Master of Planning Studies
- Master of Science
- Master of Business Administration/Juris Doctor
- Master of Engineering/Master of Planning
- Master of Health Administration/Juris Doctor
- Master of Health Administration/Master of Nursing
- Master of Information/Juris Doctor
- Master of Public Administration/Juris Doctor
- Doctor of Medicine/Master of Science

#### **Per-Course Fee Degrees**

Some graduate programs at Dalhousie University are based on a per-course fee, and students pay fees according to the number of courses they take in any given term. All such degrees have a minimum number of courses required to be completed for graduation. Per-course fee degrees apply to the following programs:

- Master of Applied Computer Science
- Master of Architecture
- Master of Business Administration (Financial Services Stream)
- Master of Business Administration (Leadership Stream)
- Master of Engineering - Only Internetworking
- Master of Health Administration
- Master of Information
- Master of Information Management
- Master of Journalism
- Master of Planning

- Master of Public Administration
- Master of Public Administration (Management)
- Master of Resource and Environmental Management
- Master of Social Work
- Master of Information/Master of Resource and Environmental Management
- Graduate Diploma in Public Administration
- Qualifying, Visiting or Special Graduate Students

#### **Master's/JD Combined Programs**

Master's students in programs combined with the JD are required to submit a Combined Degree Form to each program administrator confirming their admission into both programs. This will ensure the student's academic record is accurate and combined program fees are charged throughout so early declaration is important.

Master's/JD combined degrees, have a program fee (as opposed to a per-course fee) based on the typical duration of their program. For example, a four-year combined program requires a student pay four years of combined program fees, including auxiliary fees, where applicable. Upon approval of the Combined Degree Form, combined degree fees are retroactively charged for all appropriate terms. While some combined programs may have reduced degree requirements, the full combined program (and auxiliary) fees are required to be paid.

#### **2.3.1 General Program Definitions - Master's Level**

Master's programs are usually structured in one of three ways: 1. a thesis plus courses; 2. courses plus a graduate project; or 3. courses only. Some programs also have a work or internship component in addition to coursework and thesis/project requirements, and this usually adds to the time necessary for completion.

Some Master's programs may have minimum residency requirements, during which time students are expected to be on campus.

A thesis-based Master's degree normally consists of a total of at least 30 credit hours of study, where most of the work is dedicated to independent research.

<b>Fee Requirement</b>	<b>Thesis plus Courses</b>	<b>Courses plus Project</b>	<b>Courses Only</b>
<i>One-Year Program:</i> one-year program fee, followed by continuing fees as required; or per-course fees	Courses as specified by the program, (normally completed in one year) and a thesis	Courses as specified by the program, and a graduate project	Courses as specified by the program
<i>Two-Year Program:</i> two years of program fees, followed by continuing fees as required; or per-course fees	Courses as specified by the program, (normally completed in two years) and a thesis	As above	As above

Master's programs or combined Master's/Diploma programs exceeding the requirements for a two-year program are considered as three-year programs and fees are applied accordingly.

#### **2.3.2 General Program Definition - Doctoral Level**

A Doctoral degree normally consists of a thesis and courses, where most of the work is dedicated to independent research.

Students are required, as part of their graduate student program, to be on campus for at least four terms in the first two years of their program. Exceptions to this requirement must be approved by the Dean of the Faculty of Graduate Studies.

**Continuous registration is required.**

## **III. Admission Requirements for Graduate Programs**



Please note that entry into Dalhousie's graduate programs is competitive, and applicants who meet the minimum requirements are not guaranteed admission. Normally, successful applicants have academic records and qualifications that are well above the minimum required.

### 3.1 Admission Requirements

The Faculty of Graduate Studies sets the minimum admission standards that are required for entry into graduate programs. Individual academic units may require additional qualifications of their candidates, and enrollment limitations usually mean that successful applicants possess qualifications that considerably exceed the minimum requirements. The Faculty of Graduate Studies reserves the right to reject applications from candidates who meet or exceed the minimum admission requirements. Final decisions on all admissions are made by the Faculty of Graduate Studies, and there are **no appeals on admission decisions**.

In all cases, candidates for admission must possess degrees that the Faculty of Graduate Studies deems to be equivalent to those granted by Dalhousie University, and that have been granted by institutions that are recognized by Dalhousie.

### 3.2 Master's Degree Programs

Candidates for admission must hold at least a four-year Bachelor's degree with a minimum B average in the last 60 credit hours from a university recognized by Dalhousie, with the following conditions:

1. For entry into a Master's program with a thesis requirement, candidates must hold a four-year Bachelor's degree with an honours or the equivalent of honours standing as granted by Dalhousie University in the area in which graduate work is to be done or an area that is relevant to the graduate work. A four-year Bachelor's degree may be considered equivalent to honours if there is evidence of independent research capacity (such as a research project as part of a course) or if the degree is officially approved as an honours equivalent.
2. Dalhousie University recognizes some three-year degrees from select universities from Bologna-signatory countries as equivalent to a four-year honours degree but makes decisions in this regard on a case-by-case basis. To be considered for admission, such an applicant must also meet the following criteria: (1) evidence of senior matriculation at the high school level (e.g., A-level exams in Britain, the baccalaureate in France, Abitur in Germany), (2) a university program of study with completion of 180 to 240 ECTS, (3) an ECTS-based average of B or better, and (4) evidence of independent research capacity (e.g., senior paper or thesis).
3. Dalhousie University recognizes some three-year degrees from select Canadian universities where a student has taken a one-year *Collège d'enseignement général et professionnel*, or "General and Vocational College;" CEGEP before entering university.
4. For entry into all other programs, candidates must hold a four-year Bachelor's degree with at least four courses, or their equivalent, taken at a senior undergraduate level in the area that graduate work is to be done or an area that is relevant to the graduate work. Candidates must achieve an average of at least a B in those four courses, as well as the overall B average in the last 60 credit hours for their degree.
5. A small number of mid-career professional Master's degrees (see [7.4.3](#)) may admit candidates either with or without a Bachelor's degree, depending on the qualifications of the applicant. Admission to such programs, as with all graduate programs, is at the discretion of the Faculty of Graduate Studies.
6. All applicants who have not completed a degree where the medium of instruction is English in a country where English is an official national language are reminded that they must also demonstrate English language competency (see section [3.4](#)).

### 3.3 Doctoral Degree Programs

The criteria for admission to Doctoral programs are more rigorous than for Master's programs. The successful completion of a Master's degree does not guarantee admission to a PhD program. Only those with demonstrated ability to perform research at an advanced level will be considered for admission.

Candidates must:

1. hold a thesis Master's degree, or its equivalent, from a recognized university for entry into a Doctoral program.
2. in exceptional circumstances, hold a Bachelor's Degree from a recognized university with a first-class (i.e., a minimum of an A- average) honours standing (including a research dissertation), for entry into a Doctoral program. Applications for direct entry to a PhD will be considered for admissions on a case-by-case basis and are normally expected to provide evidence of independent research capacity (e.g., senior paper or thesis, peer-reviewed publications).
3. hold a first-class (i.e., a minimum of an A- average) non-thesis Master's Degree may be considered for admission to a PhD on a case-by-case basis where evidence of independent research can be clearly demonstrated, such as a major research

paper, presentations at scholarly conferences, publications in journals, etc. Such candidates may also be admitted into a Master's program with the possibility of transferring into the Doctoral program, as described below.

4. demonstrate English language competency if they have not completed a degree where the medium of instruction is English in a country where English is an official national language (see [section 3.4](#) in this Calendar).

### **3.3.1 Transferring from a Master's to a PhD Program**

A few academic units will admit a Bachelor's graduate with a first-class honours degree into the Master's program and, at a later point, recommend them for transfer to the Doctoral program. Also, in exceptional circumstances a student with a non-thesis Master's degree of first-class standing (average course grade of A- or better) may be admitted into a thesis Master's program with the possibility of transferring into a PhD on the basis of outstanding academic and research potential. Students who wish to transfer from a Master's to a Doctoral program should do so within the first five terms of initial registration. Such requests must be made before the term in which the transfer is to take effect.

## **3.4 English Language Competency**

English is the language of study at Dalhousie; therefore, all applicants, if they have not completed a degree where the medium of instruction is English in a country where English is an official national language, must demonstrate their capacity to pursue a graduate-level program in English before admission. The standard test is the TOEFL. The Faculty of Graduate Studies sets a minimum acceptable score of 92 for the internet-based test. Some programs within the Faculty of Graduate Studies set a higher **minimum**, such as a TOEFL of at least 100 (see academic unit listings for individual program admission requirements). The following tests will also be accepted with the stated minimum scores: IELTS, 7; PTE Academic, overall score of 65 and nothing below 54; MELAB, 85; CanTEST, average of at least 4.5 with no band score lower than 4.0; CAEL, 70 overall, with no band score lower than 60.

Alternatively, a prospective student may enroll in the ESL program with the Dalhousie College of Continuing Education and obtain a grade of at least A- on the final stage of that training (EAP level 2). The language competency test may be waived if the applicant has completed a degree at a recognized university where the language of instruction is English. The claims must be verified by the Faculty of Graduate Studies. Test scores are valid for two years from the date the test was written.

Further information on these tests may be obtained from:

#### **Test of English as a Foreign Language (TOEFL)**

TOEFL/TSE Service

PO Box 6151

Princeton, NJ

USA 08541

[toefl@ets.org](mailto:toefl@ets.org)

[www.toefl.org](http://www.toefl.org)

The Dalhousie code is 0915 for the TOEFL test.

#### **International English Language Testing System (IELTS)**

University of Cambridge Local Examinations Syndicate

1 Hills Road

Cambridge, UK CB12EU

[ielts@ucles.org.uk](mailto:ielts@ucles.org.uk)

[www.ielts.org](http://www.ielts.org)

#### **Dalhousie University College of Continuing Education**

College of Continuing Education

1459 LeMarchant Street, Suite 2201

PO Box 15000

Halifax, NS B3H 4R2

[cte@dal.ca](mailto:cte@dal.ca)

[www.cte.dal.ca](http://www.cte.dal.ca)

#### **Pearson English Test (PTE Academic)**

[pte-acustomersupportapac@pearson.com](mailto:pte-acustomersupportapac@pearson.com)

[pearsonpte.com](http://pearsonpte.com)

#### **Michigan English Language Assessment Battery (MELAB)**

English Language Institute (ELI)

University of Michigan

555 S. Forest Avenue  
Ann Arbor, MI,  
USA 48104-2584  
[melabelium@umich.edu](mailto:melabelium@umich.edu)  
[www.cambridgemicigan.org/melab](http://www.cambridgemicigan.org/melab)

**Canadian Test of English for Scholars and Trainees (CanTest)**  
CanTEST Project Office  
Language Testing Services  
University of Ottawa  
70 Laurier Avenue East, Room 130  
Ottawa, ON K1N 6N5  
[cantest@uottawa.ca](mailto:cantest@uottawa.ca)  
[cantest.uottawa.ca](http://cantest.uottawa.ca)

**Canadian Academic English Language Assessment (CAEL)**  
CAEL Assessment Testing Office  
School of Linguistics and Applied Language Studies  
Carleton University  
126 Paterson Hall, 1125 Colonel by Drive  
Ottawa, ON K1S 5B6  
[cael@carleton.ca](mailto:cael@carleton.ca)  
[www.ielts.org](http://www.ielts.org)

### 3.5 Conditional Admissions

Some admissions may be contingent on certain conditions. If a conditional admission is approved, the condition must be met within the specified period of time. If the condition is not met by the stated deadline, the student's admission will be rescinded.

Conditions on admission cannot subsequently be waived.

### 3.6 Graduate Examination

Some academic units require GRE or GMAT scores of applicants as a criterion for program admission. Check academic unit listings in this Calendar for information on specific program admission requirements.

### 3.7 Students Requiring Accommodation

See Accommodation Policy for Students in the [University Regulations](#) section of this calendar.

## IV. Graduate Application Process

### 4.1 Application Forms and Supporting Materials

All applicants for graduate programs at Dalhousie must complete the Faculty of Graduate Studies Application for Admission Form. Students can apply online at [dal.ca/admissions/graduate.html](http://dal.ca/admissions/graduate.html). A printable version of the Application Form can be found on the [Faculty of Graduate Studies website](#). The application must be accompanied by the application fee. All supporting materials (including academic reference letters, official transcripts from all post-secondary institutions attended, official GMAT or GRE scores where required, official ESL test scores, etc.) are to be sent directly to the academic unit to which the student is applying. **Note that supporting documents (transcripts, letter of reference, etc.) for all applications will be verified for authenticity.** Most documents submitted as part of the application cannot be returned or photocopied for the student.

Two letters of reference are required for admissions into a graduate degree. These letters are normally required to be from academics familiar with the applicant, but may be replaced in some course-based professional masters programs with relevant professional references according to the following schedule:

1. For applicants who completed their undergraduate (or related graduate) degree with the past 3 years: two academic references.
2. For applicants who completed their undergraduate (or related graduate) degree 3 to 5 years ago: a) one academic reference and one relevant professional reference, or b) two academic references.
3. For applicants who completed their undergraduate (or related graduate) degree more than 5 years ago: a) two relevant professional references or b) one academic reference and one relevant professional reference, or c) two academic references.

Reference letters provided in confidence to Dalhousie University for purposes of determining a candidate's suitability for admission to an academic program, receipt of an honour or award, or evaluating the applicant's research projects and materials will be kept confidential. This confidential reference may be used internally by Dalhousie University for the purposes of considering the applicant for institutional, provincial, and federal awards or scholarships.

## 4.2 Application Deadlines

At Dalhousie students normally begin their programs in the fall term (September) (see [Admission Dates](#)). However, some academic units may allow applicants to commence in the winter term (January) or the summer term (May) or may have different deadlines. General Deadlines for applications are as follows:

General Application Deadlines	Canadian Applicants	Non-Canadian Applicants
For September Admission	June 1	April 1
For January Admission	October 31	August 31
For Summer Admission	February 28	December 31

Please note, some academic units have application deadlines that are earlier than the Faculty of Graduate Studies deadlines. Refer to the specific academic unit listings in this Calendar for these dates.

## 4.3 Academic Unit and Faculty Approval

All applications are reviewed by academic units, and the academic units then make a recommendation to the Faculty of Graduate Studies for acceptance or rejection, including any required conditions of admission. At this stage, many academic units will contact the applicants to let them know of a positive recommendation to the program. **While this may be a useful indication to the applicant that their application is progressing, it does not constitute official acceptance into the graduate program, even if it is in the form of a written letter.**

## 4.4 Official Response

All successful applicants will receive an official email from the Registrar's Office indicating they have been accepted into the graduate program. This email is the only official notification that the university sends out. **All other forms of communication, including letters from an academic unit or a Faculty, do not constitute official acceptance by the University.**

## 4.5 Scholarships

Successful applicants who are also approved for a graduate scholarship will receive an email or letter of notification of their award from the Faculty of Graduate Studies. Unofficial funding discussions may occur between the applicant, supervisor and/or academic unit throughout the admission process. **Emails or letters from supervisors or academic units do not constitute official offers of financial support by the University.** An official statement of scholarship support can be requested from the Faculty of Graduate Studies.

## 4.6 Deferrals

Newly accepted applicants who, for reasons beyond their control, are unable to take up their position on the date for which they were accepted, may request a deferral of their start date to a later term. Students may request a deferral of one, two, or three terms. No student may receive more than one deferral. Students wishing to request a deferral should contact the academic unit to which they were accepted as soon as possible. Deferrals are not automatic. Deferrals require the permission of the academic unit and the Faculty of Graduate Studies. Students must ensure that their registration is removed before a deferral can be considered. If registration is not removed, fees may occur. If a student has not requested a deferral before the last day to register deadline, the student must reapply for the new term, pay a new application fee, and pay any fees associated with registration. At the discretion of the department, the student may also be required to submit new supporting documents.

# V. Registration Procedures and Regulations

**It is the student's responsibility to register.** Registration is the process by which students officially establish with the University (through the Registrar's Office) their degree program (MA, MSc, PhD, etc.) and status (full-time or part-time) and pay the appropriate academic fees (to Student Accounts). Both aspects of the process (program/status and fee payment) must be completed before a student can be considered registered. **Graduate students must maintain their registration status on a continuous basis and pay the required fees (see examples below).**

## 5.1 Registration Status and Fees

### ***Program-Fee Programs***

Graduate students in program-fee programs must maintain their registration on a continuing basis. Program-fee students must register for REGN 9999 in all three terms and pay the appropriate program fee. REGN 9999 is listed in the Academic Timetable as “Registration Course - Graduate”. In addition to REGN 9999, program fee students should be registered in a course, project or thesis every term.

Students who fail to register by the approved deadlines will be considered to have lapsed registration. Such students will not be permitted to submit a thesis, nor will they receive services from the University during that academic term. Students who allow their registration to lapse will be considered to have withdrawn and will be required to apply for readmission. (See [section 5.5.1](#)).

### ***Per-Course Fee Programs***

With approval of the student's academic unit and the Faculty of Graduate Studies, graduate students in programs where fees are paid on a per course basis can allow their registration to lapse for one term per academic year without penalty (*e.g.*, for a summer term when no appropriate courses are offered). Students who allow their registration to lapse for more than one term per academic year will be considered to have withdrawn.

Students who fail to register in a second term per academic year by the approved deadlines will be considered to have lapsed registration. These students are considered to have withdrawn and will be required to apply for readmission. (See [section 5.5.2](#)).

A per-course fee student, at the thesis-only stage of their degree requirements, such as MArch, MHA, MI, MSW must register for REGN 9999 and Master's Thesis, every term, in order to maintain their status as a thesis student.

### ***Thesis or Project Registration***

Once graduate students begin their thesis or project, they must continue to register in their thesis every term and work toward its completion until all degree requirements are met.

## **5.2 Registration Procedures**

All registration is carried out via the web at [www.dal.ca/online](http://www.dal.ca/online). Students are encouraged to register early to ensure course availability and to avoid scholarship payment delays.

Continuing students who require an extension to their program or have an outstanding annual progress report will not be permitted to register until the extension or annual progress report has been officially approved by the Faculty of Graduate Studies.

### ***5.2.1 Registration Deadline***

All students must be registered by the deadline for each term. Students who do not register on or before the University's last day to register must submit a course add/drop form (approved by the academic unit) to the Faculty of Graduate Studies for permission to register. A financial penalty will apply. Students who fail to register by the official deadline will not receive service from the University during that term.

## **5.3 Voluntary Withdrawal**

Students who withdraw from a degree program are to inform the Graduate Coordinator of their program immediately and the Faculty of Graduate Studies in writing. The immediacy of notification is important for two reasons: to mitigate as much as possible the consequences for the academic record; and the amount of possible fee reimbursement. Both are influenced by the date of the action. Students must contact Student Accounts directly to make arrangements to receive their fee reimbursement. Please see “Academic Dates” for academic and financial implications of withdrawal. **The decision to withdraw is not official until it has been processed by the Faculty of Graduate Studies and received in the Registrar's Office. In rare circumstances, and only if University approved regulations allow, will the Faculty of Graduate Studies back-date a withdrawal notice.**

## **5.4 Academic Dismissal**

A student can be dismissed from a program for *i*) academic reasons (*e.g.*, course failure, failure to meet admission requirements, program requirements, failure to maintain registration status, or lack of academic progress), *ii*) for academic offences such as plagiarism, irregularities in the presentation of data, *etc.*, (see [Intellectual Honesty](#) and [Senate Discipline Committee](#)), or *iii*) for non-academic reasons, (see [Code of Student Conduct](#)). The student will be notified of the reason for the dismissal by the appropriate body.

An academic dismissal is normally for one year; however, the student record notation is permanent. During this period, work completed at another institution while on Academic Dismissal may not be used for credit at Dalhousie.

#### **5.4.1 Final Dismissal**

A second academic dismissal is normally considered final dismissal from that program of study.

#### **5.4.2 Reinstatement of Students**

A student who is academically dismissed may apply in writing to their academic unit for reinstatement within the one-year dismissal period. Reinstatement is not automatic nor guaranteed. As part of the request, students must discuss transitions and any necessary supports, including program sequencing requirements. Only the request for reinstatement by the academic unit is sent to the Faculty of Graduate Studies for approval. All supporting documents requested/required by the department are not to be forwarded to the Faculty of Graduate Studies. Supporting documents must be housed at the departmental level. A student may be reinstated only once during the course of their program. Students who are denied reinstatement are still eligible to apply for readmission following a one year wait period, however, readmission is not guaranteed.

### **5.5 Readmission**

A student who has been dismissed for academic reasons and has not been reinstated, has voluntarily withdrawn, or whose registration has lapsed may apply for readmission within 10 years of initial registration and is expected to complete all degree requirements before the tenth anniversary of the original program start date. Readmission is not automatic and requires the permission of the academic unit and the Faculty of Graduate Studies.

#### **5.5.1 Readmitted Program-Fee Students**

Students who fail to register and pay tuition fees for any term before the degree program requirements have been fulfilled are considered to have withdrawn and will be required to apply for readmission. Readmission is not guaranteed, but if readmitted, program-fee students must pay lapsed registration fees for the terms in which they were not registered to a maximum of three terms at the rate of \$250 per term.

Readmitted students who were academically dismissed will not be charged lapsed registration fees for the three terms immediately following the official date of dismissal. Lapsed registration fees will be charged for any term thereafter, to a maximum of three terms at the rate of \$250 per term.

Students in thesis programs who have not maintained registration are normally required to have a timetable for completion via the progress report in GSIS, approved by the academic unit and the Faculty of Graduate Studies, before they can be readmitted. Students may be readmitted only once during the course of their program. Application for readmission must meet normal application deadlines.

#### **5.5.2 Readmitted Per-Course Fee Students**

With approval of the academic unit and the Faculty of Graduate Studies, per-course fee students can allow their registration to lapse for one term per academic year without penalty (e.g., for a summer term when no appropriate courses are offered). Students who fail to register and pay tuition fees for more than one term per academic year before the degree program requirements have been fulfilled are considered to have withdrawn and will be required to apply for readmission. Readmission is not guaranteed, but if readmitted per-course fee students must pay lapsed registration fees for the terms in which they were not registered, to a maximum of three terms at the rate of \$250 per term.

Readmitted students who were academically dismissed will not be charged lapsed registration fees for up to three terms immediately following the official date of withdrawal.

#### **5.5.3 Readmission after 10 years from program start**

Students may apply to a degree program after the 10-year limit. Readmission is not automatic but follows the procedures for normal admission. In addition, such admission does not constitute an automatic acceptance of credit for past work or past examinations. Requests to have past course work and exams recognized and assigned credit requires an independent advanced-placement assessment, that must be submitted to the Faculty of Graduate Studies. Advanced-placement credits must be approved both by the academic unit and the Dean of the Faculty of Graduate Studies. Students re-admitted under this clause should be aware that they will be assessed fees and tuition commensurate with a new incoming student, over the same period.

### **5.6 Concurrent Registration**

A student may, with written permission from the Deans of both programs, register for two concurrent programs or diploma programs, either at Dalhousie or one at Dalhousie and one elsewhere, for a maximum of 12 months, usually the first academic year of the Dalhousie graduate program. This does not apply to a prerequisite degree student finishing a Master's degree who has been accepted into a PhD program. In that case, the student must first complete the Master's and then register in the PhD program in January, May or September as applicable and approved by the academic unit. If the student fails to complete the Master's degree for a particular entry point, the student must request deferral of admission to the next available start date.

## 5.7 Student Categories

All graduate students must be registered in each year and in each term of their graduate program in one of the categories listed below. Master's students wishing to change status from full-time to part-time or *vice versa*, must submit their request, with academic unit approval, to the Faculty of Graduate Studies. Such requests must be made before the start of the term in which the change of status is to take effect.

### 5.7.1 Full-Time Student (Program-Fee)

A full-time graduate student paying [program fees](#) (see section 2.3) is a student who has been approved by the academic unit and the Faculty of Graduate Studies as working full-time on their graduate degree. All Doctoral students must register full-time throughout their studies. Program-fee students must maintain their registration for the summer, fall and winter terms. The following programs must register for REGN 9999 every term and pay fees for only two terms per academic year: LLM, MEC, MHI, and MSc (HUCD). Full-time students are expected to work on their degree requirements on a full-time basis. To maintain adequate progress, discretionary work not related to the program requirements should not exceed an average of 16 hours per week per term.

### 5.7.2 Full-Time Student (Per-Course Fee)

A student who is taking a minimum of nine credit hours per term is considered full-time. Per-course fee students who have completed all degree requirements except their thesis may be considered full-time or part-time. Full-time or part-time status for these students is determined based on the student's full-time or part-time thesis work. Full-time students are expected to work on their degree requirements on a full-time basis, therefore paid employment unrelated to their degree requirements should not exceed an average of 16 hours per week per term.

### 5.7.3 Part-Time Student (Program-Fee)

At the Master's level a part-time student paying [program fees](#) (see Section 2.3) is a student who has been approved by the academic unit and the Faculty of Graduate Studies as working part-time on their graduate degree. A part-time graduate student cannot carry more than eight credit hours per term. Program fee students must maintain their registration for the summer, fall and winter terms.

### 5.7.4 Part-Time Student (Per-Course Fee)

A student who is taking fewer than nine credit hours in a semester is considered part-time.

### 5.7.5 Continuing Student (Program-Fee Programs Only)

This status applies to a Master's student in a program that charges a program-fee and who has completed the program-fee requirement but has not yet finished all the degree requirements (usually the thesis). The student is required to pay a continuing fee on a per term basis.

### 5.7.6 Qualifying Student

Students who hold a recognized undergraduate degree, as defined in section 3.2, but who do not meet all admission requirements for a Master's program, may be recommended for admission to a qualifying program. Admission to a qualifying program may be recommended by academic units for students in the following circumstances:

1. The student has the required GPA in a recognized undergraduate degree program but may not have the required background for graduate studies in a specific discipline. The academic unit will specify the required advanced undergraduate courses that must be completed with B- or higher marks to qualify for admission to the graduate program.
2. The student does not meet the overall GPA requirements for admission to graduate programs. The academic unit will specify a set of advanced undergraduate courses that, upon satisfactory completion, will raise the GPA to the level defined in section 3.2.
3. The student has a three-year undergraduate degree. First-class candidates may be considered for admission to a Qualifying Year. Qualifying students are required to complete eight to 10 senior undergraduate courses with a minimum grade of B-.

Qualifying students can be full-time or part-time; take as little as three credit hours course or as many as 30 credit hours courses chosen from undergraduate courses or a mixture of undergraduate and graduate courses. Taking Qualifying-Year graduate courses does not affect tuition for students in program-fee graduate programs. Qualifying students are not eligible for Faculty of Graduate Studies scholarships or bursaries and must apply for admission to the appropriate graduate program in the usual way towards the end of the qualifying period. Qualifying students must pass all the courses with no grades below a B- and a minimum average of at least B, and fulfill additional requirements as required by their academic unit and the Faculty of Graduate Studies. Successful completion of the qualifying year does not guarantee admission.



Qualifying programs are not available for students applying to Doctoral programs. Some academic units admit students to the Master's program first and then consider them for transfer into the Doctoral program at a later date (see [Section 3.3.1](#)).

### **5.7.7 Special Student-Graduate Studies (SSGS)**

With permission from the Faculty of Graduate Studies, it is possible for individuals to take courses outside of a program for personal or professional enrichment. The registration category for non-program students taking graduate courses is Special Student-Graduate Studies (SSGS). Such students may take a maximum of 12 credit hours with the permission of the course instructor and the appropriate Graduate Coordinator. Because all graduate courses must be taught at a consistent standard to graduate level students, non-program students must have records that meet the minimum entrance requirements for a graduate program, though reference letters are not required except at the discretion of the department. Students are ineligible to apply for Special Student status in a course if their application to the program was rejected due to academic standing or have been academically withdrawn from the program. Applications must be approved by the Faculty of Graduate Studies as admissible to a graduate program and should adhere to the same application deadlines.

Students who register in this category do so normally as an enrichment to their professional fields. Students trying to qualify for entry to a graduate program must follow a different route: either a Qualifying Year program, if eligible, or a program of study as a Special Student in an undergraduate Faculty.

Graduate courses completed under SSGS status can be used for credit toward formal graduate programs with approval by the Faculty of Graduate Studies.

### **5.7.8 Visiting Students**

#### **5.7.8.1 Visiting Student Graduate Studies (VSGS) - Letter of Permission**

Students registered as graduate students at another university may register at Dalhousie to take courses on a Letter of Permission (LOP) from their home university. Visiting students must have records that meet the minimum entrance requirements for the course for which they are registering and must receive permission from the Dalhousie professor teaching the course(s). Students must submit the graduate application, the application fee and an approved Letter of Permission to the Registrar's Office.

#### **5.7.8.2 Visiting Graduate Research Students (VGRS) - Research**

Students registered as graduate students at another university may register at Dalhousie to conduct research under the supervision of a Dalhousie researcher as a visiting graduate research student. They are not attending Dalhousie University under the auspices of a signed, bilateral exchange agreement and will not be attending courses.

Visiting research students are normally at Dalhousie for up to three terms, and while here, they are expected to work full time on their research. They must provide to the Faculty of Graduate Studies written support for their research from their home university and from their Dalhousie supervisor. Students must submit the graduate application and the application fee to the Registrar's Office. The two letters of support must be submitted to the Faculty of Graduate Studies.

International VGRS may be able to opt-out of the Dalhousie Health Plan if they have comparable alternative insurance. To do so, international visiting graduate research students must take a copy of their health insurance plan to the Dalhousie Student Union (DSU) Health Plan Office to ensure it meets minimum coverage.

### **5.7.9 Letters of Confirmation**

A letter confirming a student's registration and/or scholarship status can be produced on request. Students should contact the Faculty of Graduate Studies for information on this service.

## **5.8 Leave of Absence**

The Faculty of Graduate Studies may approve a Leave of Absence (LOA) for medical reasons, unexpected emergencies, exceptional academic or career opportunities requiring interruption of your studies, or for other reasons supported by your department/program.

Students seeking a leave of absence should discuss their circumstances with their department. The department will submit an application on behalf of the student for a LOA to the Faculty of Graduate Studies, with approval signatures from the student, student's Supervisor (if applicable) and Graduate Coordinator. Faculty of Graduate Studies will consider departmental approval as sufficient justification for a LOA.



A LOA will not normally exceed three consecutive terms (12 months). The normal degree completion times listed in section 7.1 will be extended by number of terms that a student is on an approved LOA.

Applications for a LOA must normally be received before the term for which it is to take effect. A LOA frees a student from paying tuition fees and releases the university from providing student services and library privileges. Students who wish to maintain medical insurance coverage while on leave must contact the Dalhousie Student Union for more information.

Students may not hold any Dalhousie scholarships during a LOA. A Student may not study elsewhere and receive credit at Dalhousie University during a LOA.

Students requesting a LOA for their first term of academic study at Dalhousie will normally be directed to the deferral of admission process instead.

#### **5.8.1 Mid-term Leave of Absence**

Unexpected emergencies which may arise during the term can be accommodated by a LOA but may have financial implications or significant impact on a student's completion of course-work. Mid-term leaves are typically reserved for medical reasons or serious problems outside of the student's control. Students seeking a leave of absence mid-term must discuss their circumstances with their department. The department will then apply on behalf of the student for a LOA to the Faculty of Graduate Studies with all approval signatures. Faculty of Graduate Studies will consider departmental approval as sufficient justification for a LOA.

Retroactive approval of a LOA will only be granted in extraordinary circumstances.

A mid-term LOA relieves the student from responsibilities for completing coursework and other program requirements during the remainder of the term. The requested LOA can extend to subsequent terms.

Any class withdrawal impacts on course grades and fee rebates will be determined by the date the leave of absence is approved and is governed by the Withdrawal and Refund Schedule. The department should contact FGS ([program.officer@dal.ca](mailto:program.officer@dal.ca)) to discuss final grade options for LOA's starting after the deadline to drop courses with a W has passed.

#### **5.8.2 Returning from a Leave of Absence**

Students returning from a LOA are expected to plan for their return at the start of an academic term. Students are encouraged to reach out to their program and supervisor prior to their return to discuss transitions and any necessary supports, program sequencing requirements, and completion of any courses which may have had an ILL grade assigned previously.

Students who are considering returning from a Leave of Absence mid-term are encouraged to contact their department and [program.officer@dal.ca](mailto:program.officer@dal.ca) to discuss feasibility and fee implications.

### **5.9 Parental Leave**

Parental Leave will be granted at the time of pregnancy, birth, or adoption. Normally, a parent leave is up to three terms (12 months). Students may request a parental leave with each new child born or adopted during their program. The normal degree completion times listed in section 7.1 will be extended by number of terms that a student is on an approved LOA.

Students must contact their department to arrange for parental leave. The department will submit a Parental Leave request to the Faculty of Graduate Studies with signatures of approval from the student, student's Supervisor (if applicable) and Graduate Coordinator.

Students requesting parental leave who normally receive graduate funding must contact [fgs.slo@dal.ca](mailto:fgs.slo@dal.ca) to discuss how parental leave will affect their funding.

Parental leave frees a student from paying tuition fees and releases the university from providing student services and library privileges. Students who wish to maintain medical insurance coverage while on leave must contact the Dalhousie Student Union for more information.

#### **5.9.1 Mid-term Parental Leave**

If a birth or adoption requires a student to take parental leave mid-term, additional planning is required to limit financial implications or significant impact on a student's completion of course-work. Students seeking a parental leave mid-term must discuss their circumstances with their department. The department will then apply on behalf of the student for a Parental Leave to the Faculty of Graduate Studies with all approval signatures. Faculty of Graduate Studies will consider departmental approval as sufficient justification.

A mid-term parental leave relieves the student from responsibilities for completing coursework and other program requirements during the remainder of the term.

Any class withdrawal impacts on course grades and fee rebates will be determined by the effective date of the parental leave and is governed by the Withdrawal and Refund Schedule. The department should contact FGS ([program.officer@dal.ca](mailto:program.officer@dal.ca)) to discuss final grade options for LOA's starting after the deadline to drop courses with a W has passed.

#### **5.9.2 Returning from Parental Leave**

Students returning from parental leave are encouraged to plan for their return at the start of an academic term. Students are encouraged to reach out to their program and supervisor prior to their return to discuss transitions and any necessary supports, program sequencing requirements, and completion of any courses which may have had an ILL grade assigned previously.

Students who are considering returning from parental leave mid-term are encouraged to contact their department and [program.officer@dal.ca](mailto:program.officer@dal.ca) to discuss feasibility and fee implications.

### **5.10 International Tuition Fees**

Masters students who do not hold Canadian citizenship or permanent residency are required to pay an additional international tuition fee (the amount being determined by the University), in addition to regular tuition fees, according to the following schedule:

Full-time Master's student (except Oral and Maxillofacial Surgery)	2 years (or equivalent)
Full-time Master's/MD student Oral and Maxillofacial Surgery	4 years
Part-time Master's student	6 years

The annual graduate program international tuition fee is charged over two terms for programs requiring two terms of fee payment.

This fee is applied to each new graduate degree in which the student registers.

Per-course fee Master's students' international tuition fee is changed per term in proportion to course registration(s).

### **5.11 Identification (ID) Cards**

All students with active registration can obtain ID cards entitling them to University services. Distance education students should consult their academic unit. ID cards must be presented to write an officially scheduled examination or to use library facilities. In addition, some services require the presentation of a valid Dalhousie ID.

## **VI. Conflict of Interest and Intellectual Honesty**

At all times, faculty members and graduate students must maintain the highest levels of integrity in their research, teaching, and educational endeavours.

### **6.1 Conflict of Interest**

Faculty members and students are expected to declare any real or perceived conflict of interest of a personal or financial nature that may influence explicitly or implicitly their participation in graduate programs and graduate administration. In a small community such conflicts are sometimes unavoidable. It should nonetheless be possible to avoid conflict of interest in the following cases:

No faculty member shall evaluate in a teaching context or supervise the thesis or project of a student who is a daughter, son, spouse, partner, or other close relative.

A faculty member is not eligible to act as supervisor for: a) another faculty member who holds their primary academic appointment in the same academic unit; or b) an employee who is in a direct reporting relationship with that faculty member.

No student or supervisor shall have a financial or family interest in the industry or business in which the student is pursuing their thesis research. If a student is employed by the company in which the research is being conducted or the student's research is marketable under terms of the supervisor's grant or contract used to provide support for the student, protection must be given to the student's contribution to the research by means of an appropriate contract, finalized before the research for the degree is commenced and signed by all parties involved.

Should any of the above conflicts exist, it will be disclosed in writing to the Dean.

Please see the [Senate guidelines on conflict of interest](#).

## 6.2 Intellectual Honesty and Plagiarism

All students should read and be familiar with the University policies on Intellectual Honesty, as described in the [University Regulations](#) section of this Calendar.

It is highly recommended that all graduate students complete the [Dalhousie Writing Centre Academic Integrity online module](#) early in their academic programs.

## 6.3 Policy on Integrity in Scholarly Activity

In accordance with the Senate Policy on Integrity in Scholarly Activity, the Faculty of Graduate Studies has adopted guidelines that focus on the involvement of graduate students in research and scholarly activity. Guidelines are available on the Senate website at [senate.dal.ca](#).

# VII. Degree Requirements

Graduate students have a maximum period of time by which to complete all of the requirements for their graduate program.

The upper time limits for the completion of degrees are:

One-year Master's, full-time:	Four years
One-year Master's, part-time:	Five years
Two-year Master's, full-time:	Five years
Two-year Master's, part-time:	Seven years
Three-year Master's, full-time:	Five years
Three-year Master's, part-time:	Seven years
PhD, full-time only:	Six years
MBA - FS:	Seven years
MPA (Management):	Seven years

## 7.1 Maximum Time for Degree Completion and Extensions

Under exceptional and well documented circumstances, such as an approved Leave of Absence or Parental Leave extensions can be granted. However, under no circumstances can a student be registered in a program beyond 10 years, including leaves, from their initial registration in the program.

## 7.2 Program Requirements

Every graduate student must have an individually approved program of studies. The program of study for each graduate student must be approved by the Graduate Coordinator in each academic unit or program and submitted for final approval to the Faculty of Graduate Studies. By the end of the first term, the Graduate Academic Unit will enter and approve the proposed program (with the total number of credits required, the names and numbers of all courses required, including ancillary courses and any other requirements and conditions) on the Graduate Student Information System. The graduate program requirements must also be approved by the Faculty of Graduate Studies. At this early stage, the student and academic unit are approving the requirements for the degree. Once approved, the program requirements in GSIS constitutes an agreed contract between the student and the University and is used by the Faculty of Graduate Studies to audit the student's file for graduation. Any changes to the approved program requirement must be agreed to by the Graduate Coordinator and the Faculty of Graduate Studies by way of an update to the existing requirements already approved in GSIS.

## 7.3 Annual Progress Report

Every thesis-based graduate student is required to submit an Annual Progress Report on GSIS to the Faculty of Graduate Studies. Annual Progress Reports must be approved by the student's Supervisor and Graduate Coordinator. The approved report is due on an annual basis, one month before the anniversary of the student's admission date. Failure to submit this report will result in delays in registration and funding. Occasionally students are required to submit progress reports more than once a year.

Students who have external funding administered by the University must maintain Annual Progress Reports to maintain scholarships.

## **7.4 Requirements for the Master's Degree**

### **7.4.1 Thesis-based Master's Degrees**

The course of study for the research degree (MA, MASc, MArch, MCSc, MSc, MDE, MEDS, MES, MURP and the thesis options available in the LLM, MEDS, MEC, MHI, MN, MLIS, MSW, and certain MA and MSc programs) may include courses, seminars, preparation of fields of study, comprehensive examinations, demonstrations of foreign language proficiency, a thesis, and oral presentation and defence of the thesis.

Requirements vary considerably from program to program, and even within the same program, depending on the student's previous experience and qualifications.

### **7.4.2 Course-based Master's Degrees**

Course-based Master's programs include the MACSc, MBA, MEng, MHA, MIM, MMM, MPA, MREM, MPLAN, MEC, MEDS, MHI, LLM, MN, MLIS, MSW, and certain MA and MSc programs. The number of courses varies, and a graduate research project is often required.

### **7.4.3 Specialty and Mid-Career Master's Degrees**

A number of specialty Master's degrees have been and continue to be developed to meet specific needs and demands for graduate education in commerce, public service, and industry. Some, but not all, of these programs are degrees designed for mid-career professionals. These are primarily course-based programs, with some component of work and professional experience (either as part of the program or as pre-requisites for admission). All or part of the courses may be offered in a distance education mode. They currently include the MBA (Financial Services), MBA (Leadership), MPA (Management), MIM, MEng (Internetworking), and MFA (Creative Nonfiction).

## **7.5 Requirements for the Doctoral Degree**

A candidate must demonstrate the ability to carry out research of high quality leading to an advance of knowledge in a specific area of study. The candidate's course of study will be initiated with the advice and direction of a supervisory committee. See [section 9.3](#) for supervisory committee structure.

The course of study may include courses, seminars, comprehensive examinations, qualifying examinations, preparation of fields of study, demonstrations of foreign language proficiency, and any other requirements considered necessary for the clear demonstration of post-Master's-level comprehension, scholarship, and ability in the candidate's particular area of study. Comprehensive exams are only taken after all coursework is completed.

## **7.6 Modification of Degree Requirements**

Modification of the official degree requirements outlined within this Calendar must be approved by FGS. Requests for modification are submitted to FGS by the program on behalf of the student, and will only be considered for one of the following reasons:

### **7.6.1 Advanced Standing (Course Substitution)**

Within the first academic term of a student's program, the department may request to substitute required core courses or required list-electives (X credit hours from a list of specific electives) with an alternative course based on advanced knowledge/experience already possessed by a student. Examples may include specialization at the undergraduate level or extensive work experience/professional training which has enabled a student to already possess advanced competency in a given area. The substituted course is intended to provide advanced-level training in a similar competency or to enable a student to diversify their course selection. Advanced standing does not reduce the overall credit hour requirements of the degree.

### **7.6.2 Advanced Placement (Degree Requirement Exemptions)**

Within the first academic term of a student's program, a student may request advanced placement credits based on graduate courses completed within a previous undergraduate or graduate program. To be eligible, the courses must be comparably equivalent to graduate courses within the student's proposed graduate program at Dalhousie University. For courses that have been counted toward a previous degree, in which a minimum grade of "B" was attained, advanced placement may be used to reduce the overall course requirements in some Dalhousie graduate programs. Application for advanced placement must be made within the first term following admission and must be approved by the Graduate Coordinator and the Faculty of Graduate Studies. Credits completed outside Dalhousie University (advanced placement, letter of permission, and transfer credits) cannot normally exceed 33% of the program's overall course requirements. Courses must have been completed within 10 years of the first academic term of a student's program.

### 7.6.3 Transfer Credit

A transfer credit allows for courses completed outside of the student's program, normally at another institution, to be used as part of the student's degree requirements. Such courses must have a minimum grade equivalency of B- on the Dalhousie graduate grade scale, cannot have been used for credit for another degree. Credits completed outside Dalhousie University (advanced placement, letter of permission, and transfer credits) cannot normally exceed 33% of the student's overall course requirements. Application for transfer credits must be made within the first academic term of the student's program and must be approved by the Graduate Coordinator and the Faculty of Graduate Studies. An original transcript and course equivalency is required if the course was not completed at Dalhousie. Courses must have been completed within 10 years of the first academic term of a student's program.

## 7.7 Courses and Grades

Courses may be full or half year (six or three credit hours respectively) and may be designated by the candidate's committee as "Required" or "Ancillary" (pass mark is B-). Some academic units cross-list graduate courses with senior undergraduate courses: in which case the requirements for graduate students are more demanding than those for undergraduates.

In some Masters programs that require completion of general elective courses, approval may be given for a limited number of senior-level undergraduate courses to satisfy some of the elective requirements. The undergraduate course(s) must be approved by the supervising committee and program and must be completed while registered in the current program (no advanced placement or transfer credits). When satisfying an elective requirement for the graduate program, the undergraduate course cannot be a fundamental or pre-requisite version of a graduate course normally offered within the program. Undergraduate courses required to address a pre-requisite knowledge gap should be completed in addition to the normal required number of credits.

In some Masters and all Doctoral programs that require completion of a specific number of graduate credits, undergraduate courses may not be used to satisfy the required number of graduate credits. Undergraduate courses may be included within the required program of study in addition to the required number of graduate credits, and in some cases would be ancillary courses (see [section 7.7.3](#)).

If a student is permitted to take one or more undergraduate courses as part of their graduate program, a minimum passing grade of B- applies.

### 7.7.1 Academic Transcript

The academic transcript is a reflection of academic history and, therefore reflects both passes and failures. It cannot be altered after the fact. Accordingly, it is essential that students be fully aware of the deadlines for adding and withdrawing from graduate courses. See [section 7.7.7](#) and [section 7.7.8](#).

### 7.7.2 Course Assessment and Grading Policy

All course assessments follow the [Grading Practices Policy](#).

Course examinations may be oral, written (closed or open book) under supervision, take home or a combination.

Students will be provided with a course outline (syllabus) by the instructor at the first meeting of the class. In order to complete a course satisfactorily, a student must fulfill all the requirements as set down in the course outline. Changes to the outline that affect assessment components, the weight of individual assessment components, or examination requirements with a value of 10% or more must have the approval of at least two-thirds of enrolled students in order to be valid.

When collaboration is included as part of course expectations, as in group projects or group assignments, the instructor will provide in the course outline a statement of the degree of collaboration permitted in preparation and submission of assignments.

Within four weeks after the beginning of each term, course outlines must be placed on file with the appropriate home academic unit.

The official grading system at the University is a letter-grade system.

All instructors of graduate courses (*e.g.*, designated 5000 and above), with the exception of a few courses for which a pass/fail grading scheme has been approved, will use the following grading scheme:

Grade	Grade Point Value	%	Definition
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A+	4.30	90-100
A	4.00	85-89
A-	3.70	80-84
B+	3.30	77-79
B	3.00	73-76
B-	2.70	70-72
F	0.00	0-69
INC	0.00	Incomplete
W	Neutral and no credit obtained	Withdrew after deadline
ILL	Neutral and no credit obtained	Compassionate reasons, illness
P	Neutral	Pass
TR	Neutral	Transfer credit on admission
Pending	Neutral	Grade not reported
MT	Neutral	Not Graded: Part of a Multi-term Course

The date for the submission of Grades is set annually by the Senate Learning and Teaching Committee in conjunction with the Dalhousie Academic Dates for that year and will normally be between seven and ten calendar days from the final day of the exam period. The date will be based on three principles:

1. Transparency and timeliness for Students, to allow for informed Course planning, and registration in future terms before the term starts.
2. Appropriate time for Instructors, to enable the effective and appropriate grading of examinations and term assignments; and,
3. Adequate time to provide necessary services to Students to enable timely academic standing assessments, advising, and convocation approvals.

The final possible date for the submission of Grades will be published along with the Dalhousie Academic Dates for each academic year.

#### **Correction of Errors in Recorded Grades**

Students must request correction in the calculation or recording of final grades by:

Fall term courses	February 1
Winter and regular session (September - April) courses	June 1
May - June courses	August 1
May - August courses	October 1
July - August courses	October 1

#### **Reassessment of a Final Grade**

Students who have concerns about final grades are encouraged to first discuss them with the course instructor, supervisor and/or Graduate Coordinator. In addition, students are advised to consult the Chair of the academic unit, Director of the School/College, Dean of the Faculty in which the grade was assigned, a Student Advocate, or the Ombudsperson. If their concerns cannot be resolved, students may also use the formal process that follows for the reassessment of final grades. Once a final grade has been submitted to the Registrar, a student who wishes to have a final grade reassessed should make a written request to the Registrar and pay the requisite fee of \$50 per course. The request must identify the specific component that the student wishes reassessed and the grounds for the request. The Registrar's Office will then forward the reassessment request to the Faculty of Graduate Studies. Such requests must be made by:

Fall term courses	March 1
Winter and regular session (Sept - Apr) courses	July 1
May - June courses	Sept 1
May - August courses	Nov 1
July - August courses	Nov 1

The reassessment will be conducted according to procedures developed for this purpose by the academic unit. The procedures should reflect the nature of the academic discipline and assessment involved and should provide for a review of the assessment by a qualified person or persons not responsible for the original evaluation. A written notification of reassessments with reasons should be returned to the Faculty of Graduate Studies no later than 45 days after receiving the request. If the reassessment results in the assignment of a grade that is (higher or lower) than the original one, the new grade will replace the original one and the \$50 will be refunded.

Note that graduate students can only request a grade reassessment for written assignments and examinations within a FGS approved course.

Students who wish information about grade re-assessment procedures should contact the Registrar's Office.

#### **Pass Standard**

Faculty of Graduate Studies regulations stipulate that graduate students must achieve a minimum grade of "B-" in all courses required for their degree program. Any lower grade will be recorded as a failure (F). For the majority of graduate programs at the university, a student who fails to meet these requirements in any term is immediately and automatically dismissed from the program. Some programs allow for students to carry a failing grade for one course without automatic dismissal. In these programs, a second failing grade will result in immediate and automatic dismissal. These programs currently include: MArch, MBA, MCSc, MEng, MASc in engineering disciplines (except Biomedical Engineering), MEC, MLIS / MI, MPA, and the MScOT Post-Professional (does not include MScOT Entry to Practice).

A dismissed student may apply, in writing, to the academic unit for reinstatement, (see [section 5.4 and section 5.5](#)). Reinstatement to a program after a failing grade must be supported by the Graduate Coordinator and must be approved in writing by the Faculty of Graduate Studies. In all programs a failed core course must be repeated, electives may be repeated or replaced at the discretion of the academic unit. If reinstated, any subsequent "F" will result in a final program dismissal. Note that academic dismissal and reinstatement will be permanently recorded on the student's official transcript.

#### **7.7.3 Ancillary Courses**

Undergraduate courses recommended by an academic unit as advisable additional background to a graduate degree program, but not specifically required for that program, are termed ancillary courses. The pass grade in ancillary courses is the same as for all graduate course requirement (B-)s. Ancillary courses must be listed on the Graduate Student Information System, but do not count towards the required number of courses for the graduate program. Normally students are limited to six credit hours of ancillary courses during their program. Students who take ancillary courses on a Letter of Permission are responsible for the tuition fees at the other institution.

Students are not permitted to register for undergraduate courses that are not part of their program requirements unless they do so as a "Special Student Undergraduate" (SSUG) with program and Faculty of Graduate Studies approval. Courses taken as an SSUG must be admitted, registered, and paid for separately. SSUG courses will appear on the student's transcript under the distinct heading of Special Student Undergraduate, and these will not be included as part of the student's graduate program.

#### **7.7.4 Audits**

Students may take one audit (equivalent of six credit hours) in each residency year of their formal program. Audits must be listed as program requirements in GSIS, must be relevant to the student's program of study, and must have academic unit and the Faculty of Graduate Studies approval. For program-fee students, audits not approved as part of their program of study will be subject to



additional tuition on the student's account. Per-course fee students will be charged the normal audit tuition for each audit registration. Audits cannot be taken on a Letter of Permission and will not be approved as part of a Qualifying program.

### **7.7.5 Independent Study, Directed Readings, and Special Topics Courses**

Students enrolled in programs requiring 30 credit hours or less of coursework may not register for more than 6 credit hours of independent study, directed readings, or special topics courses (combined). This maximum is increased to 9 credit hours for programs requiring 31 to 45 credit hours of coursework, and 12 credit hours for programs requiring more than 45 credit hours of course work. Registration in each case requires written approval of the Graduate Coordinator of the unit. Note that some academic units place lower limits on the number of independent study, directed readings or special topics courses permitted within their programs.

### **7.7.6 Letters of Permission**

(i) Courses approved by the academic unit and Faculty of Graduate Studies (after examination of course descriptions) can be taken at other universities as part of the graduate degree program, provided the course is not available at Dalhousie.

Students in good academic standing, with no holds on their registration may receive permission to take courses for credit at another university. For the Letter of Permission form and guidelines, see [www.dal.ca/grad/currentstudents/forms/](http://www.dal.ca/grad/currentstudents/forms/).

Students may not take courses outside Dalhousie for graduate credit unless prior approval has been given by the Faculty of Graduate Studies. Courses are never approved retroactively.

The maximum number of courses taken outside Dalhousie University shall normally be confined to 33% of the course requirements, except in cases where a university-level agreement, governing specific cooperative arrangements, has been negotiated and is in operation.

The normal regulations governing grading policy (see [section 7.7.2](#)) apply to courses taken at other institutions (e.g., a C+ on a graduate course taken elsewhere will be deemed an “F” in the student's program and will render them liable to academic dismissal). Students who fail a course may not replace that course with a Letter of Permission except by special permission from the Faculty of Graduate Studies.

Students who are required to take courses at other institutions outside the Maritimes will be considered for a Letter of Permission on a case-by-case basis, (e.g., if the course is a necessary component of a student's program). Dalhousie will normally pay the tuition for students who pay a program-fee to take courses offered at other Maritime universities, to the equivalent cost of a Dalhousie course, provided the course is not available at Dalhousie. The tuition for an approved course taken at a university outside the Maritimes is normally the responsibility of the student. Any charges above that amount are the responsibility of the student.

Students who receive approval to take courses at institutions inside or outside the Maritimes for convenience or for non-academic reasons do so at their own expense. See regulation on concurrent registration (see [section 5.6](#)) whereby a student is required to receive approval to take any courses outside their degree requirements.

Graduate students who pay a program-fee must be registered at Dalhousie and have paid appropriate fees before receiving approval.

Students who pay on a per-course fee basis are responsible for paying fees for courses taken outside Dalhousie.

#### **(ii) Credit Courses at Non-Canadian Universities**

Grades received at an international institution will be recorded on the student's Dalhousie record as either “Pass” or “Fail”.

#### **(iii) Graduate International Exchange and Study Abroad Programs**

A number of graduate programs enable Dalhousie University students to pursue part of their studies in another country and culture. These are coordinated by the Study Abroad and Exchange Advisor in the International Centre (IC). Additional information is available at [www.isd.dal.ca](http://www.isd.dal.ca).

### **7.7.7 Withdrawal from Courses**

The last dates for adding and deleting courses are published in the schedule of Academic Course Add/Drop Dates at the front of this calendar.



Students may not transfer from full to part-time status by withdrawing from courses after the deadlines listed in the schedule of [Academic Course Add/Drop Dates](#).

All regularly scheduled courses may be added or dropped on the web at [www.dal.ca/online](http://www.dal.ca/online) by the deadline listed in [Academic Course Add/Drop Dates](#). Special dates and processes apply to courses involving open learning.

Please note that dropping or changing courses may affect your eligibility for student aid.

**Non-attendance does not, in itself, constitute withdrawal. Withdrawals are effective when a student withdraws from courses on the web at [www.dal.ca/online](http://www.dal.ca/online) or written notification is received at the Faculty of Graduate Studies.**

#### ***7.7.8 Incomplete Courses***

A student who fails to complete the required work for a particular course during the normal period of the course will receive a grade of “F”. However, where circumstances warrant, a grade of “Incomplete” (INC) may be assigned. Subsequent completion of the work following the end of the course may result in a change of grade by the course instructor, as long as the work is completed before the following deadlines:

Fall term courses	February 1
Winter and Regular (September-April) term courses	June 1
May-June courses	August 1
May-August courses	October 1
July-August courses	October 1
MBA(FS) - Please consult the academic unit entry.	

For GPA purposes a grade of INC holds a credit value of 0.0.

After these deadlines, an “INC” cannot be changed without permission of the Faculty of Graduate Studies.

Where the formal deadline for completion of work is beyond the INC deadline, the course instructor can request the Faculty of Graduate Studies extend the INC for an approved period of time.

At the discretion of the course instructor, alternate arrangements for examinations, tests or the completion of assignments may be made for students who are ill, or in other exceptional circumstances.

All outstanding grades, including ILL or INC, must be addressed before registration for the next term.

#### ***7.7.9 Incomplete due to Illness***

Students must have a plan to complete, repeat or replace any course with an outstanding grade, including ILL or INC, before registration for the next term. If grades are still outstanding into the next term and no arrangements have been made, students may be required to re-register in the course.

#### ***7.7.10 In-Progress Courses and Multi-Term Courses***

**In-Progress Courses:** The grade of “In Progress” (IP) is used to identify and report on-going satisfactory progress in thesis, research projects, and courses/seminars structured to progress over a flexible number of academic terms. Students are expected to register in the course in each term that they are engaged in course-related activities. A final grade is only assigned in the academic term where course requirements are met.

**Graduate Multi-Term Courses:** The grade of “Multi-Term” (MT) is used to temporarily identify a course sequence that spans multiple terms in an academic year in per-course fee graduate programs. The MT grade in each term is replaced by a final grade upon successful completion of the course sequence.

#### ***7.7.11 Academic Standards***

When the work of a student becomes unsatisfactory, (including insufficient progress), or a student’s attendance is irregular without sufficient reason, the Faculty of Graduate Studies may require withdrawal from one or more courses, or academic dismissal from the Faculty.

## **VIII. Examinations**

There are five types of examinations for graduate students:

1. Course Examinations;
2. Qualifying or Preliminary Examinations;
3. Comprehensive Examinations;
4. Thesis Proposal Examinations (Defences); and
5. Thesis Examinations (Defences).

This section deals with 1, 2, 3, and 4. Thesis examinations are covered in [Section 10](#).

## **8.1 Course Examinations**

There are no supplementary examinations for graduate students. For further information on the grading scheme and the regulations governing examination grading see [section 7.7.2](#).

## **8.2 Qualifying or Preliminary Examinations**

Some programs require Qualifying or Preliminary Examinations. These occur early in the program (often within the first year) and are sometimes used to assess the transfer of a student from a Master's to a Doctoral program. The exam may take the form of the presentation and defence of a research project, or it may involve a written or oral examination.

## **8.3 Comprehensive Examinations**

These examinations in the candidate's area of study are part of Master's degree programs in some academic units and all PhD degree programs. Refer to particular academic units entries for details. It is the responsibility of academic units to make the necessary arrangements for these examinations. Comprehensive exams should only be taken after the completion of all required coursework.

The comprehensive examination may be oral, written, or both and covers subjects relevant to the general area of the candidate's research and teaching competency. Academic units are required to set out their rules on PhD examinations in writing and to give a copy to each PhD student on or before registration for the comprehensive examination. Failure to pass will result in academic dismissal. The Faculty of Graduate Studies must be notified immediately upon the completion of the examination process, and the result becomes part of the student's official record.

## **8.4 Thesis Proposal Defence**

Thesis programs require a formal defence of a thesis proposal/proposition. Such defences are considered a form of graduate examination. The thesis Proposal Defence may be oral, written, or both. During such an examination a student should defend a proposed thesis question and the method(s) required to answer that question and prove that they have the depth of knowledge needed to answer the question. Academic units are required to set out their rules on Thesis Proposal Defences in writing and to give a copy to each student well before the examination.

## **8.5 Academic Accommodation**

See the Accommodation Policy for Students in the [University Regulations section](#) of this calendar.

# **IX. Thesis Supervisors and Supervisory Committees**

All thesis students must have a Supervisor (or two Co-supervisors) and a Supervisory Committee. In many academic units, the appointment of a supervisor is a pre-requisite for admission into the program. All graduate research projects must have an Advisor who supervises the project work and thus acts as an effective supervisor. In some academic units, graduate research projects also require an Advisory or Guiding Committee.

**The membership must be kept up to date as part of the student's program requirements in GSIS.**

## **9.1 Qualifications of the Supervisor**

A thesis Supervisor or Co-supervisor must be a member of the Faculty of Graduate Studies.

Regular members and Adjunct (Retired) members may solely supervise students. Adjuncts in all other categories may only co-supervise students. Regular members wishing to supervise/co-supervise students in units other than their unit of appointment may do so by seeking a cross-listing with the other academic unit. Cross-listing is not required for members to serve on graduate committees in other units. Adjunct (Retired) and Adjunct (FGS) members wishing to supervise or co-supervise students in another academic unit must seek an adjunct appointment through that unit. Adjunct (Retired) and Adjunct (FGS) members may serve on supervisory and/or examination committees in that unit without an adjunct appointment.

See the following tables for specific details:

#### **Serving on a Supervisory Committee (Unit of Appointment)**

<b>Appointment</b>	<b>Type of Committee</b>	<b>Supervisor</b>	<b>Co-supervisor</b>	<b>Serve on Committee</b>
Regular Member	PhD	Yes	Yes	Yes
	Master's	Yes	Yes	Yes
Adjunct (Retired)	PhD	Yes	Yes	Yes
	Master's	Yes	Yes	Yes
Adjunct (FGS)	PhD	No	Yes	Yes
	Master's	No	Yes	Yes
Adjunct (Scholar)	PhD	No	No	Yes (one only)*
	Master's	No	Yes (one only)*	Yes (one only)**

\* An Adjunct (Scholar) may serve on only one committee or co-supervise only one student in total.

\*\* An Adjunct (Scholar) Postdoctoral Researcher may not serve on the supervisory or examining committees of their supervisor's students. Only one Adjunct (Scholar) Postdoctoral Researcher may serve on a given Master's or PhD supervisory or examining committee.

#### **Serving on a Supervisory Committee (non-Appointment Unit)**

<b>Appointment</b>	<b>Type of Committee</b>	<b>Supervisor</b>	<b>Co-supervisor</b>	<b>Serve on Committee</b>
Regular Member	PhD	Needs Cross*	Needs Cross*	Cross-listing not required
	Master's	Needs Cross*	Needs Cross*	Cross-listing not required
Adjunct (Retired)	PhD	Need Adjunct**	Need Adjunct**	Adjunct not required
	Master's	Need Adjunct**	Need Adjunct**	Adjunct not required
Adjunct (FGS)	PhD	No	Need Adjunct**	Adjunct not required
	Master's	No	Need Adjunct**	Adjunct not required
Adjunct (Scholar)	PhD	No	No	No
	Master's	No	No	No
Adjunct (Scholar) Postdoctoral	PhD	No	No	No
	Master's	No	No	No

\* Cross-listing in the non-appointment unit is necessary.

\*\* Adjuncts Retired and FGS must seek an additional appointment as an Adjunct in the non-appointment unit.

Depending on the unit, experience on supervisory or examining committees, teaching graduate courses, or acting as a co-supervisor may be necessary before undertaking the role of thesis or project supervisor. Most natural science and engineering departments require faculty research funding as a criterion for supervision. All programs must maintain a copy of their criteria for supervision.

A Doctoral student must be supervised by a faculty member with a PhD or its equivalent, and a Master's student must be supervised by a faculty member with at least a Master's degree or its equivalent. Equivalency must be based on a faculty member's record of research activity and supervisory experience. In the case of co-supervision of a Doctoral student, at least one of the supervisors must have a PhD or its equivalent (or in the case of a Master's thesis, a Master's degree or its equivalent). See the [FGS website for membership details](#).

## 9.2 Co-supervision

The Faculty of Graduate Studies recognizes four types of co-supervision:

1. that dictated by regulation 9.1 above where a co-supervisor is added because the other supervisor does not have an appropriate academic qualification (e.g., a PhD or equivalent);
2. that which arises from the desire of a student to draw equally upon the expertise of two individuals, or where an interdisciplinary project may require the equal expertise of two supervisors from different disciplines;
3. that which introduces a new faculty member to the standards of the academic unit by providing an opportunity to work with an experienced supervisor; and
4. that which conforms to the Faculty of Graduate Studies membership requirements. Adjunct (FGS) and Adjunct (Scholar) members may be the academic co-supervisor of a Dalhousie student provided the student also has an internal co-supervisor who is a Regular Member of the Faculty of Graduate Studies.

## 9.3 Supervisory Committees

Graduate students in thesis programs must have a supervisory committee. All members of supervisory committees are Regular, Adjunct (Retired), Adjunct (FGS), or Adjunct (Scholar) members of the Faculty of Graduate Studies. Thesis candidates should have one supervisor or two co-supervisors and at least two additional members, at least one of whom is from the student's graduate academic unit. Regular members should constitute no less than 50% of the membership of a supervisory committee. The tables given in [Section 9.1](#), define explicitly the permission to serve on supervisory committees. Supervisory committees are selected by the supervisor in consultation with the student. A supervisory committee should complement the expertise available to the student in completing their research program. The membership of all supervisory committees must be recorded in GSIS, and changes to membership must be submitted on the student's program update form and recorded by the department in GSIS.

Supervisory committees should meet at least twice a year during the thesis research period and more often in the writing stages of a student's program. Normally the agreement of all committee members is required before an academic unit brings forward a thesis for examination.

## 9.4 Guidelines for the Supervision of Graduate Students

The responsibilities and rights of students, supervisors and academic units outlined in the sections below have been developed for students in thesis programs; however, where appropriate units are encouraged to adopt these practices for project students and their supervisors.

### 9.4.1 Selection of Supervisor

In disciplines that do not assign supervisors at the time of admission, the selection of a supervisor should be based primarily upon competence in the field of the proposed thesis topic. Within this restriction, the academic unit should seek to accommodate the student's choice of supervisor, although it is not obliged to guarantee the choice. Academic units are expected to maintain guidelines for determining the number of thesis supervisions a faculty member can concurrently undertake.

### 9.4.2 Responsibilities of Supervisors

Supervisors have the following responsibilities:

- to provide reasonable access to their student(s) and to be available for consultation at relatively short notice;
- to be as helpful as possible in suggesting research topics and in assisting students to define their theses;
- to tell students approximately how long it will be before written work, such as drafts of chapters, can be returned with comments;
- to be thorough in their examination of thesis chapters, supplying, where appropriate, detailed comments on such matters as literary form, structure, use of evidence, relation of the thesis to published work on the subject, footnoting, and bibliographical techniques, and making constructive suggestions for rewriting and improving the draft;
- to indicate clearly when a draft is in a satisfactory final form or, if it is clear to the supervisor that the thesis cannot be successfully completed, to advise the student accordingly;

- to know the academic unit and University regulations and standards to which the writer of a thesis is required to conform, and to make sure that the student is aware of them;
- to continue supervision when on leave, possibly with arrangements also being made for members of the supervisory committee to assist the student for the leave period;
- to advise and help the student to approach other faculty members for assistance with specific problems or even to request the reading of a chapter or section of the thesis;
- to see that all ethics and animal care approvals, as appropriate, are secured.

### **9.4.3 Responsibilities of Students**

Graduate students in thesis programs have the following responsibilities:

- to choose a topic (with the supervisor's aid and advice) and to produce a thesis that is essentially their own work;
- to produce a thesis that meets the standards of scholarship required by the academic unit and University, including demonstration of their capacity for independent scholarship and research in their field;
- to acknowledge direct assistance or borrowed material from other scholars or researchers;
- to realize that the supervisor has undergraduate or other duties which may at times delay the student's access to the supervisor;
- to give serious and considered attention to advice and direction from the supervisor;
- to submit their work to the judgment of the academic unit and to abide by its decision when any rights of appeal, if exercised, have been exhausted;
- to know the academic unit and University regulations and standards to which the writer of a thesis is required to conform;
- to comply with all ethics and animal care requirements.

### **9.4.4 Rights of Supervisors**

Supervisors have the following rights:

- to expect students to give serious and considered attention to their advice concerning what they regard as essential changes in the research and thesis;
- to terminate supervision and advise the student to find another supervisor where evidence shows the student does not heed advice and ignores recommendations for changes in the research and thesis, or if the student is not making a reasonable effort;
- to have their thesis supervision properly credited by the academic unit as an intrinsic part of their workload so that, in the assignment of duties, they are not overburdened to the point of having their effectiveness impaired as supervisors;
- to have the student acknowledge, by footnoting, all portions of the supervisor's own research over which the supervisor wants to retain future rights of authorship;
- to retain the right to use the results of research carried out under their supervision for the benefit of a larger project — with the understanding that students will retain scholarly credit for their own work and be given acknowledgment of their contribution to the larger project.

### **9.4.5 Rights of Students**

Students have the following rights:

- to have a clear understanding of what is expected in thesis writing (expected length, acceptable methodology, validity of topic, notification of progress);
- to expect help from their supervisor in establishing a feasible topic, in solving problems and assessing progress as the thesis is being written;
- to receive a fair assessment of the completed thesis and explanations of negative criticism;
- to be allowed to have a new supervisor when they can offer convincing reasons to the academic unit for the change and the change can be reasonably accommodated by the academic unit;
- to be protected from exploitation by their supervisor or other faculty members if the latter should:
  - a) intrude upon the student's right of authorship or fail to give a student authorship credit for team research (where applicable, the academic unit's protocols on authorship should be provided to students before they embark on research), or
  - b) divert the student's efforts from the timely completion of the thesis;

- to submit a thesis even if the supervisor is not satisfied, although such action should be taken only in extreme cases and after full consultation with the academic unit.

#### **9.4.6 Responsibilities of the Academic Unit**

Academic units have the following responsibilities:

- to provide necessary facilities and supervision for each student admitted, and not to accept more candidates than can be offered effective supervision. Academic units should carefully consider such matters as faculty retirements, sabbatical leaves, teaching loads, and library resources before admitting each student with a declared research interest. When, as is often the case in many disciplines, applicants are unable to choose a field of research until they have had some experience in graduate study or in a particular academic unit, the academic unit should still regulate admissions according to the number of faculty members available for supervision;
- to uphold a high academic standard for theses;
- to provide adequate supervision at all times, so that, when a supervisor leaves the University for another permanent position, substitute arrangements are made as soon as possible;
- to allow students to change supervisors if their research interests shift or develop in a new direction if the change can be reasonably accommodated by the academic unit;
- to provide processes which assist and encourage students to complete the thesis, such as early review and approval of topic and methodology, guidelines on access and appeals, oversight of the students' schedule, and a clearly stated system of thesis review and evaluation;
- to regard supervision of graduate students as a major consideration in making replacement appointments for faculty;
- to encourage students to give papers as they proceed, so that they can test their ideas on a wider audience than the supervisory committee;
- to ensure that the Graduate Coordinator acts as a general overseer of student progress;
- to instruct all students or see that they attend workshops on research ethics.

## **X. Thesis Regulations**

### **10.1 Ethical Review**

All research undertaken at Dalhousie University must comply with current institutional policies regarding responsible conduct of research, academic integrity, human ethics, and animal ethics. The policies on human and animal ethics are accessible through the Research Services - Ethics Review webpage.

### **10.2 Preparation of Manuscript and Submission of Theses**

Thesis manuscripts must be prepared in accordance with Faculty of Graduate Studies guidelines at [www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/format.html](http://www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/format.html).

#### **10.2.1 Preparation of Graduate Theses**

All graduate theses, whether for Master's or Doctoral degrees, must be completed according to the formal Faculty of Graduate Studies regulations for thesis preparation and submission. Failure to do so may cause delays in completion and may even result in the cancellation of a scheduled defence or examination.

#### **10.2.2 Thesis Originality and Editing**

The thesis must represent a coherent body of original work by the student. It must display a scholarly approach and thorough knowledge of the subject.

Plagiarism in any form is unacceptable ([plagiarism.dal.ca/](http://plagiarism.dal.ca/)). Students suspected of plagiarising any materials will be subject to Senate disciplinary processes.

In some disciplines it may be appropriate for the thesis to include published or submitted manuscripts, papers, or reports authored or co-authored by the student. Students who wish to pursue this option must have the prior consent of their supervisory committees and must obtain appropriate copyright permission.

It is expected that the student has made a substantial contribution to any such manuscripts. Where co-authored manuscript(s) are included in the thesis, the student's contribution must be clearly indicated ([www.dal.ca/faculty/gradstudies/currentstudents/thesisanddefences/forms.html](http://www.dal.ca/faculty/gradstudies/currentstudents/thesisanddefences/forms.html)). The publication or acceptance of such

manuscripts before the thesis defence in no way supersedes the examination committee's evaluation of the work, including requesting revisions.

The thesis is the primary and permanent record of the student's work. As such, it is important that it both be written by the student (with appropriate editorial advice as needed) and conforms to normal academic standards. Assistance in improving writing skills is available at both the Faculty and University levels (e.g., Writing Centre [www.dal.ca/writingcentre](http://www.dal.ca/writingcentre)).

### 10.2.3 Submission and Registration Deadlines

All thesis students must refer to the Schedule of Academic Dates in this calendar for submission deadlines and registration deadlines.

Students must be registered for the term in which they present their approved electronic theses to the Faculty of Graduate Studies, as well as for the term in which they have their defence. Students will not be permitted to submit their thesis or proceed to defence unless they are appropriately registered, and all fees have been paid.

Deadlines for the submission of fully completed and approved theses (following examination and revision) are final in all cases. Failure to meet the deadlines will result in additional registration fees.

Students must apply to graduate through [dalonline.dal.ca](http://dalonline.dal.ca) by the published deadlines.

For thesis students the published deadlines for the final approved thesis to be submitted to the Faculty of Graduate Studies office in order to be eligible to graduate in May or October are final in all cases.

It is the responsibility of the student to ensure that all regulations have been met. Failure to comply with the regulations can result in delay in graduation.

## 10.3 Master's Theses

Completed theses for the Master's degree must be submitted to the Faculty of Graduate Studies no later than the published deadlines (see [Academic Dates](#)).

### 10.3.1 Master's Examination

The mode of supervision and examination of Master's theses varies among academic units. This diversity recognizes differences in the nature of theses within Master's programs and differences in the culture of thesis examination within different disciplines at the Master's level. The Faculty of Graduate Studies requires the following minimum arrangements for the examination of Master's theses.

### 10.3.2 Master's Thesis Examining Committee

Each Master's thesis shall be examined by an examining committee, following the criteria given below:

1. There shall be a Chair, usually the Graduate Coordinator or designate, who is not a participating member of the Supervisory Committee, and whose duty is to ensure that the exam is appropriate and fair and to submit a report as noted below. The Chair is not an examiner.
2. The table below summarizes these minimum requirements and the examiners status with the Faculty of Graduate Studies. Additional examiners, who may or may not be members of the Faculty of Graduate Studies, are permitted beyond these minima.

	Single Supervisor	Co-supervised
Chair (independent)	1 (Grad. Co-ordinator or designate with Regular FGS membership)	1 (Grad. Co-ordinator or designate with Regular FGS membership)
Minimum Examiners	1 Supervisor with Regular FGS* Membership	1 Co-supervisor with Regular FGS* Membership
	1 Reader with Regular FGS Membership*	1 Co-supervisor with FGS Membership*
	1 Reader with FGS Membership*	1 Reader with Regular FGS Membership*
		1 Reader with FGS Membership*

\* See Section I of this Calendar

1. Voting: Only examiners with a Faculty of Graduate Studies appointment may vote on the outcome of an examination and sign the Master's Thesis Approval Form.
2. Defence format: Master's theses may be examined either through oral or written defence.  
*Oral Defence:* In the case of an oral defence, it shall be public and the defending student must be in physical attendance at the examination. The standard procedure for an oral defence shall be a short presentation by the student, questions from the Examining Committee (one or more rounds) and *in camera* deliberation by the committee. The results of the exam will be communicated to the student. If time permits, questions from the audience may be allowed before the *in-camera* session. *Written Defence:* Examination by written submission must provide for the candidate to be able to respond to the comments, criticisms, and recommendations of the examining committee through the exchange of written commentary.
3. Outcomes: Theses are either approved or rejected. The categories are a) approved as submitted. b) approved upon specific corrections with a clear timetable for completion, normally within one month, or c) rejected. The committee may recommend that the student be allowed to re-submit a revised thesis for re-examination.
4. Reporting: The examination Chair shall submit a written report to the Chair and Graduate Coordinator of the academic unit. In the case of failure, the Graduate Coordinator must send an additional written notification of failure to the Faculty of Graduate Studies.
5. Electronic Submission: See Electronic Submission of Final Thesis (see [section 10.7](#)).
6. The Faculty of Graduate Studies regulations on the examination of Master's theses constitute minimum requirements.

## 10.4 Doctoral Theses

Doctoral theses must display original scholarly work, expressed in satisfactory literary form, consistent with the discipline concerned, and be of such value as to merit publication.

## 10.5 Regulations for the Defence of a Doctoral Thesis

All Doctoral theses must be examined in a public oral defence, to be conducted by an Examining Committee, recommended by the academic unit, and approved by the Faculty of Graduate Studies. A candidate shall not be permitted to proceed with the oral defence and examination until all of the following requirements have been met: (i) all required coursework completed successfully; (ii) comprehensive examination passed; (iii) thesis title approved; (iv) Examining Committee established; (v) the style and format of the thesis meets the requirements of the University and appropriate copies of the thesis have been submitted as per regulations and deadlines in [10.6.1](#) below. Normally a candidate proceeds to oral defence with the approval of the Supervisor and Supervisory Committee. A candidate may proceed without the consent of the supervisor and committee, but a signed declaration included on the PhD Thesis Submission Form is required by the Faculty of Graduate Studies.

### 10.5.1 Doctoral Defence Procedures

1. Appointment of External Examiner:  
On the Request to Arrange Oral Defence of a Doctoral Thesis form, the head of the academic unit (or Graduate Coordinator where appropriate) shall recommend to the Associate Dean of the Faculty of Graduate Studies the name of the proposed External Examiner that was approved by the Supervisory Committee. Usually, the appointment of an External Examiner occurs three months before the anticipated date of defence. The person suggested should be an acknowledged expert in the field or discipline of the research being examined in the thesis, must not have been directly involved in the student's research in any way, should possess a Doctoral degree or equivalent, and should have demonstrated experience of Doctoral supervision to degree completion and examination. Evidence of these qualifications must be explicit in the C.V. submitted for the proposed External Examiner. The choice of the External Examiner must be approved by the Faculty of Graduate Studies. If the first choice External Examiner is unacceptable to the Faculty of Graduate Studies or if that person is unavailable, the Faculty of Graduate Studies will contact the academic unit and request information for an alternate External Examiner. The Graduate Coordinator may then confirm the availability of the External Examiner and propose dates and times for the defence. Once the date and time have been confirmed by the academic unit then the formal invitation to the External Examiner is issued by the Faculty of Graduate Studies.
2. Thesis Required for External Examiner: At least six weeks prior to the scheduled defence, the Candidate shall send a PDF copy of both the thesis and their current CV to the Faculty of Graduate Studies Office ([thesis@dal.ca](mailto:thesis@dal.ca)). The PhD Thesis Submission Form and PhD Examination Information Form with all signatures must be sent to the Faculty of Graduate Studies. FGS will send the thesis to the External Examiner once the PhD Thesis Submission Form has been received and



the date and time of the defence has been determined. The candidate shall also send the abstract from their thesis for publication in a public notice of defence (the abstract must be submitted in Word compatible format to [thesis@dal.ca](mailto:thesis@dal.ca)).

If the External Examiner requests a hard copy of the thesis, Faculty of Graduate Studies will send it via courier.

3. Thesis Required by Committee and Academic Unit: The candidate will provide the thesis to the Examining Committee (excluding the External Examiner) and the graduate secretary for use by other interested faculty and students. Interdisciplinary PhD students must submit this final copy to the Director of the Interdisciplinary PhD program.
4. No arrangements will be made for the oral examination until all these requirements are fulfilled. The examination will be held no earlier than four weeks after submission of the thesis, thereby allowing adequate time for the thesis to be read by the External Examiner.
5. The Faculty of Graduate Studies will establish the place for the examination. Wherever possible the Coburg Board Room in the Mona Campbell building will be used.
6. The Faculty of Graduate Studies will send a copy of the thesis to the External Examiner at least four weeks before the examination, with a request to submit the Examiner's Report of the thesis no later than one week prior to the defence date.
7. The External Examiner will submit by mail, fax, or email, a constructively critical and analytical report (the External Examiner's Report) to the Faculty of Graduate Studies at least one week prior to the scheduled date of the defence. The Examiner's Report must include a recommendation on whether or not the thesis should proceed to defence. Where the recommendation is not to proceed, the report should indicate what, if anything, would be required to make the thesis acceptable. Note that a decision to proceed to defence does not imply that the thesis is approved, only that it is acceptable for defence. The External Examiner and the Examining Committee will have questions that must be answered to their satisfaction, and a thesis can be rejected as a result of the defence. The Examiner's Report must not be disclosed to the candidate or the Supervisory Committee prior to the defence. If participation by the External Examiner is not possible, the defence should be rescheduled.
8. If the External Examiner does not recommend that the thesis proceeds to examination, then within 12 months, a revised thesis may be resubmitted and sent to either the original External Examiner or to a new External Examiner, as deemed appropriate by the Faculty of Graduate Studies. A doctoral thesis may be submitted to the Faculty of Graduate Studies for examination no more than twice.
9. If the External Examiner recommends that the thesis proceed to defence, notice of the public defence of the thesis will be published and sent to all relevant academic units by the Faculty of Graduate Studies. All interested faculty, students, and members of the public will be welcome to attend the defence.
10. Variation of the regulations outlined above may be permitted only with the written permission of the Faculty of Graduate Studies.

#### PhD Examination Committee Minimum Composition:

	Single Supervisor	Co-supervised
Chair (independent)	1 (appointed by FGS)	1 (appointed by FGS)
External Examiner	1 (External to Dalhousie, appointed by FGS)	1 (External to Dalhousie, appointed by FGS)
Minimum Examiners	1 Supervisor with Regular FGS* Membership	1 Co-supervisor with Regular FGS* Membership
	1 Reader with Regular FGS Membership*	1 Co-supervisor with FGS Membership*
	1 Reader with FGS Membership*	1 Reader with Regular FGS Membership*
		1 Reader with FGS Membership*
Departmental Representative	1 (Regular Membership)	1 (Regular Membership)
Minimum Total	6	7

\* See [Section I](#) and [Section 9.1](#) for further clarification. Regular members should constitute no less than 50% of the membership of a supervisory committee.

Voting: Neither the Chair nor the Departmental Representative may vote on the outcome. Only the External Examiner and examiners who hold Faculty of Graduate Studies membership may vote. They and the Departmental Representative will sign the PhD Thesis Approval Form.

### 10.5.2 Oral Examination

The oral examination of a doctoral thesis is the culmination of the candidate's research program. It exposes the work to scholarly criticism and gives to the candidate the opportunity to defend the thesis in public. The roles of the committee members are as follows:

1. Chair of the Defence: The Examination is chaired by a member of the Panel of PhD Defence Chairs.
2. Examining Committee: The Examining Committee consists of the research supervisor or co-supervisors, at least two additional members, and the External Examiner who shall be from outside the University. A Departmental Representative (the chair of the academic unit or a designate) is included as a non-voting and non-examining member of the committee.
3. The Departmental Representative attends the public and *in camera* sessions of the defence. The role of the Departmental Representative is to ensure the academic unit expectations are adhered to and reports such to the Defence Chair.
4. Order of Examination Proceedings: a) the Chair of the Defence opens the proceeding with a brief description of the protocol; b) the candidate is questioned on the thesis following a summary presentation no longer than 20 minutes; c) the Chair will give priority to questions from the External Examiner and then from the other members of the Examining Committee in some pre-arranged order; d) the audience will then be invited to ask questions; e) the Chair adjourns the examination when the Examining Committee decides that further questioning is unnecessary, and the candidate and all members of the audience are required to leave the room; f) the Chair then presides over the Examining Committee during its deliberations *in camera*; g) following the *in camera* session, the candidate is invited back into the room and is informed of the decision of the committee; h) the Chair oversees the completion of the PhD Thesis Approval Form as appropriate and completes the Defence Report and returns it immediately to the Faculty of Graduate Studies Office.
5. *In camera* Deliberations and Grading: The decision of the Examining Committee is based both on the thesis and on the candidate's ability to defend it. The thesis is graded approved or rejected. A thesis can be a) accepted by the Examining Committee as submitted; b) accepted on condition that specific corrections with a clear timetable for completion normally within one month are made or c) rejected. The thesis can be rejected on grounds of form as well as content. If specific corrections are required, the thesis will be returned to the candidate with a time limit for the completion of all corrections, normally no more than one month. Specific corrections will usually be left to the satisfaction of the research supervisor.
6. Proceedings in the Case of Rejection: If the thesis is rejected, the committee can recommend that the student be encouraged to re-submit a revised thesis. The revised thesis will be re-read by an Examining Committee, at least two of whose members were on the original committee. The thesis shall be submitted to an External Examiner who may be the original External Examiner if the Associate Dean of Graduate Studies considers this to be desirable. The candidate shall defend the thesis before an Examining Committee in the usual way. If the thesis is rejected again, there will be no third examination. Such a student will be academically dismissed without the possibility of reinstatement.
7. Variation of the procedures stipulated above may be permitted only with the written permission of the Faculty of Graduate Studies.

Anomalies or deviations from the procedures or actions detailed above will be dealt with solely by the Dean of the Faculty of Graduate Studies. The Dean(s) of the Faculty in which the student is enrolled cannot intercede in matters related to the defence of a thesis (Master's or PhD).

## 10.6 Electronic Submission of Final Approved Theses

All theses are submitted electronically to the **Dalhousie Institutional Repository (DalSpace)**, where they are searchable and available to the public via the internet.

All final, approved Master's and PhD theses, that is, after examination and approval of any required changes, are submitted directly to the Faculty of Graduate Studies as PDF/A files via DalSpace. These files are termed "electronic theses" or "E-theses". The procedures for E-theses approval and submission can be found on the Faculty of Graduate Studies website at: [dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/submission.html](http://dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/submission.html). It is the student's responsibility to meet Faculty of Graduate Studies formatting requirements for the thesis and to ensure that the thesis has been converted into a compatible PDF/A version. Electronic submission of the thesis must be accompanied by original, paper forms, which are retained on file at the Faculty of Graduate Studies. These include: Thesis Approval Form, Dalhousie Thesis Licence Agreement, and Student Contribution to Manuscripts form (if applicable). All forms must have original signatures.

Within one week of submitting the E-thesis to the Dalhousie Institutional Repository (DalSpace) it is reviewed by the Faculty of Graduate Studies, if it is not approved as complete it will be returned to the student for corrections. Once it is approved as complete it is then committed to the institutional repository and then harvested by Library and Archives Canada who circulates copies according to the International Inter-Library Loan Code, with full copyright protection for the author. Similarly, E-theses are also stored by DalSpace where they are searchable and available to the public via the Internet.

## 10.7 Thesis Embargo

When a thesis has been uploaded to DalSpace it will normally be included in the institutional repository and the Library and Archives Canada (LAC) collection unless there is a compelling reason for withholding it. Students who wish to have their thesis withheld from DalSpace and Library and Archives Canada can request an embargo for a one year period by filling out the Application to Embargo a Thesis form found at [www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/forms.html](http://www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/forms.html). Applications to Embargo a Thesis must be submitted to the Faculty of Graduate Studies before the student's defence.

When the submission is approved, the student and supervisor will be notified in writing of the thesis approval which will include an expiration date for the embargo, upon which the thesis will automatically be released. FGS does not send reminders regarding this date.

In certain cases, a one-year extension can be requested. Requests must be in writing to the Faculty of Graduate Studies ([thesis@dal.ca](mailto:thesis@dal.ca)) at least one month before the expiry of the initial one-year embargo. The request must include a detailed explanation of the reason for the additional one-year hold. This request will be reviewed by the Associate Dean for approval.

## XI. Convocation

Convocation ceremonies are held in May/June and October.

### 11.1 Applying to Graduate

Applications to graduate are made through [dalonline.dal.ca](http://dalonline.dal.ca) by December 1, for Spring Convocation and by July 2 for Fall Convocation. Dates and information are available on the Convocation website [dal.ca/convocation](http://dal.ca/convocation). A \$50 fee will be charged for applications submitted after the deadline. Applying to graduate is a requirement to graduate.

In the event that a student has applied to graduate but will not graduate, the student must complete the Request to Cancel Application to Graduate. Students must apply to graduate again by the appropriate deadline in order to be included at a later convocation.

### 11.2 Letter of Confirmation for Completion of Degree

When a student has fulfilled all the requirements for the degree in advance of the official graduation date, a letter to that effect can be obtained from the Faculty of Graduate Studies. The Confirmation Letter Request Form is located on the Faculty of Graduate Studies website under [Current Students/Forms and Documents](#).

### 11.3 Conferring of Degrees

Successful candidates for degrees are invited to appear at convocation in the proper academic dress to have the degree conferred upon them. Any graduating student who is unable to appear at the convocation is expected to notify the Registrar in writing before May 4 for the Spring Convocation, or September 15 for Fall Convocation, giving the address to which, the degree or diploma is to be mailed.

Detailed information regarding the upcoming ceremony dates, location, dress etc. is available on the Convocation website [dal.ca/convocation](http://dal.ca/convocation).

### 11.4 Academic Dress

Graduates of the University are entitled to wear gowns and hoods of black material. The distinctive part of the costume is the lining of the hood, which for the various degrees currently offered are as follows:

- JSD: Black gown faced with Olympic blue silk bordered with yellow silk; black corded hood silk/lining of Olympic blue silk and bordered with yellow silk; birretum is black velvet with blue and yellow cord
- LLM: Purple silk
- MA: Crimson silk
- MArch: White/two parallel stripes of red corded border

- MArch (Post-Prof.): White/vermilion border
- MAHSR: White silk/sky blue border with white piping
- MACSc: Emerald green/gold border with white piping
- MASc: Blue/gold border with white piping
- MBA: Turquoise silk
- MCSc: Emerald green/gold border with white piping
- MDE: Medium blue/scarlet border
- MEC: Emerald green/purple border with turquoise piping
- MEDS White/three parallel stripes of white and vermilion corded border
- MEng: Blue/gold border
- MES: Brown silk
- MFA: Royal blue lining/crimson silk border with white corded piping
- MHA: Sky blue silk/white border
- MHI: Scarlet silk/emerald green border
- MIM: Mint green satin/white border
- MJ: Royal blue/royal blue border with white corded piping
- MLIS: Mid-forest Green silk
- MMM: Navy silk/sea green border
- MN: Apricot silk
- MPA: Sky Blue silk
- MPer: Gold silk/scarlet silk border
- MPLAN: Peacock blue/green corded border
- MREM: Brown silk/white border
- MSc: Scarlet silk
- MSW: Citron silk
- PhD: Black gown faced with yellow silk; black hood with a lining of yellow silk; birretum is the doctor's bonnet of black velvet with yellow cord.

## XII. Appeals

The FGS [Student Appeals Committee](#) hears appeals from decisions (or the refusal to make decisions) regarding academic standards or the application of the Faculty of Graduate Studies academic regulations made by FGS staff, deans or its representatives (e.g., Chairs of Doctoral Thesis Defences).

Students may bring an appeal when they believe there has been unfairness, including bias or irregularity in decision making.

### 12.1 Appeal Procedures

Students should first attempt to resolve their concerns informally with the person(s) that made the decision in question.

If the concern cannot be resolved informally, a student may appeal the decision in writing to the Chair of the Faculty of Graduate Studies Student Appeals Committee ([Graduate.Studies@Dal.Ca](mailto:Graduate.Studies@Dal.Ca)) within **20 working days** of the decision being conveyed to the student. The student must deliver a [Notice of Appeal](#) to the Chair that includes the following information:

- a description of the exact nature of the appeal including a summary of events and chronology and any supporting arguments and evidence that the decision in question was unfair;
- names of witnesses, if any, to be called at the hearing;
- any other relevant considerations;
- supporting letters, if applicable and;
- the requested resolution.

The student has the right to be accompanied at the hearing by a support person or advocate.

### 12.2 Appeal of the Faculty of Graduate Studies Student Appeals Committee Decision

The student may appeal the decision of the committee to the [Senate Appeals Committee](#).

### 12.3 Jurisdiction

The jurisdiction of the Faculty of Graduate Studies Student Appeals Committee **does not** extend to the following, each of which may be addressed through home Faculty Student Appeals Committees, other processes in the University, or are not appealable:

- decisions made by faculty members and/or academic administrators in home Faculties. These could include decisions related to course work, course examinations, qualifying and preliminary exams, comprehensive exams, thesis proposal defences and Master's thesis defences.
- admissions decisions
- scholarship, awards, and bursary decisions
- grade reassessments
- requests to waive an academic regulation on a compassionate basis
- allegations of academic or scholarly misconduct
- allegations of non-academic misconduct
- allegations of discrimination (including failure to provide reasonable accommodation)
- allegations of professional unsuitability.

## XIII. Departmental and Program Listings

The following entries are designed to provide general information about particular graduate programs. Although general Faculty of Graduate Studies requirements apply to all graduate programs, the methods of fulfilling these requirements vary considerably among academic units.

Each academic unit entry includes the following information:

1. A list of faculty members engaged in the teaching of graduate courses and/or the direction of graduate research. Faculty members whose major appointments are in other academic units are so indicated. In addition, the names of other researchers in the academic unit and adjunct appointees may be listed. Beside each name there may be a list of keywords indicating the major areas of research expertise and interest of the faculty member.
  2. A description of facilities available may be included. Some general regulations may be described.
  3. A list of admission requirements in addition to those of the Faculty of Graduate Studies. In some cases, the minimum requirements outlined in Section 2 are not sufficient for entry into a particular program. Other particular requirements may be listed.
  4. A description of degree program requirements includes:
    - a) Program fee duration (if applicable), and typical time required to complete the program
    - b) Coursework, including credit hours, required
    - c) Other academic requirements
    - d) Thesis requirement
    - e) Other requirements
1. A representative list of course offerings and brief course descriptions. Not all of the courses will necessarily be offered in a given year.
  2. A list of areas of specialization.

## XIV. Centre for Learning and Teaching

The Centre for Learning and Teaching (CLT) works in partnership with academic units, faculty members, and graduate students to enhance the practice and scholarship of learning and teaching at Dalhousie University. CLT takes an evidence-based approach to advocating for effective learning and teaching practices, curriculum planning, services to support the use of technology in education, and institutional policies and infrastructure to enhance the Dalhousie learning environment (See page 288 for more information about CLT services and resources).

Certificate in University Teaching and Learning: The Certificate program is offered to Doctoral students and Postdoctoral researchers by the CLT in collaboration with the Faculty of Graduate Studies. The purpose of the program is to assist academic units in preparing students for their teaching responsibilities and to enhance their professional development opportunities for other careers.

CLT also offers a non-credit course: Learning and Teaching in Higher Education (CNLT 5000). This course may be taken as part of the Certificate program, or separately. CNLT 5000 is a seminar course designed to bring together practical and theoretical aspects of learning and teaching in post-secondary settings.

## Certificates

Please see the menu to the right for a full list of graduate certificates.

Certificates are one way that recognizes graduating students have achieved a level of proficiency or specialization in a particular area or subject. Certificates vary in their goals and requirements: many have a research or practicum component, some are interdisciplinary and requiring work in more than one department, while others focus on a specialization within a single program. Some Certificates are designed for students enrolled in particular programs, while others are broadly applicable to students in any program (or can be completed independent of another graduate degree at Dalhousie)

Certificates will be recorded on the student's academic transcript and completion of the requirements are confirmed in June and October. Certificates are not conferred during Convocation but are included with any other degree parchment. Certificates awarded as a stand-alone credential are available for pick up from the Registrar's Office. Please refer to the [Dates section of the Convocation website](#) for the date your certificate will be available.

Students currently enrolled in a graduate degree at Dalhousie who wish to enroll in a certificate must contact the certificate coordinator/department to initiate an application. Additional fees may apply for courses taken as part of the certificate when completed concurrently with a graduate degree.

Some certificates do not require an applicant to already be enrolled in a graduate degree at Dalhousie. Prospective students looking to apply to these certificates are required to submit an [Admissions Application](#) for a Dal Graduate Certificate and pay the online application fee. Applicants are encouraged to consult the certificate coordinator for advice prior to applying.

Students enrolled concurrently in a graduate certificate and graduate degree are governed by the registration requirements and academic regulations applicable to their primary graduate degree. Students enrolled solely within a graduate certificate are considered Per-Course Fee students for the purpose FGS regulations around registration procedures and regulations.

A separate application to graduate is required upon completion of the certificate.

For information about specific graduate certificates, please contact the certificate coordinator.

## Certificate in Archives

**Offered by:** School of Information Management

**Coordinator:**

Sandra Toze

Suite 4010, Rowe Management Building

6100 University Ave

Sandra.Toze@dal.ca

902-494-2488

**Overview:**

The **Archives Certificate** will recognize the particular knowledge, behaviours, skills, competencies, and attitudes considered critical to working in an Archival setting. The goal of the certificate is to provide students with the foundations of knowledge regarding modern archival work, focusing on a Canadian context. The suite of courses within the Certificate are designed to build from a basic to a more advanced understanding of the archives practice, as well as the core tools for description and to manage collections which range from print to audio visual, and digital. Students will develop an understanding of the relevant standards and guidelines within archival science.

### **Admission Requirements / Eligibility:**

MI certificates are limited to students enrolled in the Master of Information (MI) program at Dalhousie University. Each of our certificates requires completion of three Elective Courses (9 Credits). During their degree, MI students can choose to complete up to two Certificates. If an elective course is included in one Certificate, it cannot be counted towards another. The electives within the Certificates will count toward both the Certificate and the Degree.

### **Certificate Requirements:**

In order to satisfy the requirements of this certificate, students must complete the following two core courses:

- INFO 6800.03 Archives
- INFO 6860.03 Archives II

As well as 1 of the following 2 courses:

- INFO 6370.03 Records Management
- INFO 6840.03 Content Management Systems

### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Aquaculture**

**Offered by:** Biology, Faculty of Science

**Coordinator:** Christophe Herbinger, christophe.herbinger@dal.ca, (902) 494-1397

### **Overview:**

The Graduate Certificate in Aquaculture is designed to be taken concurrently with a Masters or PhD program, and is particularly suited to students whose thesis research relates to aquaculture. Students graduating with certificate have general knowledge in aquaculture (i.e., culture systems, engineering, oceanography, nutrition, modelling, economics, management, sustainability, etc.) as well as advanced skills and knowledge in one of a number of specialties in aquaculture.

### **Admission Requirements / Eligibility:**

The certificate is structured to be completed concurrently with a Masters or PhD program at Dalhousie University. Current graduate students are encouraged to contact the coordinator prior to applying.

### **Certificate Requirements:**

Core course requirements:

BIOL 5602.03: Introduction to Aquaculture

Electives (Pick 6 credit hours from the following courses. At least 3 credit hours must be selected from Group A unless an exemption is approved by the certificate coordinator):

#### Group A: Aquaculture-focused electives

BIOL 5660.03: Ecosystem Modelling for Aquaculture

BIOL 5603.03: Practical Aquaculture

BIOL 5604.03: Field Aquaculture

BIOL 5805.03: Special Topic in Aquaculture\*

AGRI 5710.03: Module Course I\*

AGRI 5705.03: Module Course II\*

Group B: Aquaculture-relevant electives

BIOL 5067.03: Ecology and Evolution of Fishes

BIOL 5815.03: Special Topic in Fish Biology\*

BIOL 5705.03: Graduate Module Classes\*

AGRI 5610.03: Special Topics in Animal Product Technology\*

OCEA 5140.03: Biological Oceanography

OCEA 5130.03: Chemical Oceanography

OCEA 5230.03: Biology of Phytoplankton

OCEA 5380.03: Marine Modelling

ENVI 5205.03: Law and Policy for Resource and Environmental Management

ENVI 5504.03: Management of Resources and the Environment

ENVI 5021.03: Fisheries Management

ENVI 5031.03: Economics for Resource and Environmental Management

ENVI 5044.03: Patterns for Sustainable Industrial Development

ENGM 6680.03: Ecosystem Modelling of Marine and Freshwater Environments

ENGM 6675.03: Risk Assessment and Management

CIVL 6115.03: Design of Water Treatment Plants

CIVL 6116.03: Biological Waste Treatment

CIVL 6117.03: Water Quality Management

POLI 5589.03: Politics of the Sea II

FOSC 6324.03: Fish/Food Processing I

FOSC 6325.03: Fish/Food Processing II

FOSC 6330.03: Fish/Food Process Engineering

LAWS 5068.03: Ocean Law and Policy: International Fisheries

LAWS 5200.03: Environmental Law

ECON 5516.03: Resource Economics

ECON 5517.03: Environmental Economics

\*The Certificate Coordinator needs to verify that the material taught in Special Topic or Module courses is relevant to aquaculture.

**Certificate Requirement Exemptions:**



Students must take 9 credit hours in the form of one core course plus two electives, ensuring that at least one of the elective courses is from Group A. The following exemptions may apply:

1. Students doing an aquaculture-related thesis or graduate project (as verified by the Certificate Coordinator), may choose their two electives from Group B.
2. Students doing an aquaculture-related thesis or graduate project may request permission to take a course not listed in the Group B electives, by submitting a written proposal to the Certificate Coordinator, explaining how the course relates to aquaculture and how it will help to advance their thesis work.
3. Students that have previously completed an introductory course in aquaculture (as verified by the Certificate Coordinator) can exchange the core course for an elective course from Group A.

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Biomedical Technology Innovation and Entrepreneurship**

**Offered by:** Biomedical Engineering, Faculties of Medicine and Engineering

**Coordinator:** Geoff Maksym, geoff.maksym@dal.ca, (902) 494-2624

#### **Overview:**

An Integrated NSERC CREATE Training Program in Biomedical Device Innovation was initiated with a generous NSERC Collaborative Research and Training Experience Program award and is now integrated as a certificate program within the School of Biomedical Engineering.

The Biomedic certificate program, a partnership between the School of Biomedical Engineering and the School of Management, is designed to train you to enhance your current engineering skill set, understand gaps in the industry where innovation is needed, and develop the business knowledge to finance your research and successfully launch your new technology.

The certificate program is available to Masters and PhD students and includes both classroom learning and an industrial placement with a local, national, or international medical device company.

The industry placement will expose you to:

- Medical Device Design & Development
- Regulatory Processes
- Clinical Trials
- Fundraising for Start-ups
- Aspects of the Start-up Process

You will be asked to observe and report on industry practices, write a medical device-related standard operating procedure (SOP) according to ISO13485, and to present to your peers during the weekly SBME seminar series.

**Admission Requirements / Eligibility:** The certificate program is open to current Dalhousie Masters and PhD students in Biomedical Engineering **Certificate Requirements:**

Core course requirements:

BMNG 5050.00: Clinical Technologies

BMNG 5210.03: Biomedical Instrumentation, Data Acquisition & Analysis

BMNG 5310.03: Entrepreneurship & the Business of Medical Technology I

Electives (Pick 3 credit hours from the following courses):

BMNG 5110.03: Biocompatibility and Biomaterials Design

BMNG 5260.03: diagnostic Imaging & Radiation Biology

Additional Requirements:

Completion of a thesis/dissertation consistent with the requirements of the School of Biomedical Engineering

Completion of an Industry Placement at a medical device company (4 weeks for MASc, 4 months for PhD). You will be asked to observe and report on industry practices, write a medical device-related standard operating procedure (SOP) according to ISO13485, and to present to your peers during the weekly SBME seminar series.

#### **Certificate Requirement Exemptions:**

Students who have completed comparable content as part of a previous graduate degree may be eligible to have certificate requirements modified through requests for advanced placement/advanced standing. Please contact the certificate coordinator for more information.

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Cloud Data Analytics**

**Offered by:** Faculty of Computer Science

**Coordinator:** Dr. Raghav V. Sampangi (MACS Program Director), raghav@cs.dal.ca, 902-494-7849

#### **Overview:**

The Certificate in Cloud Data Analytics defines a pathway in which students develop core skills in cloud computing, data mining and analytics. It prepares a student to design, develop, deploy, and manage large-scale data analytics applications on cloud platforms.

Students who complete the certificate will be prepared to:

- 1) Design cost effective cloud-based solutions for organizing, securing, and scaling client applications.
- 2) Evaluate the necessary infrastructure aspects of data science in applications.
- 3) Develop applications to do large-scale data wrangling and analytics in key application areas such as finance and ocean science.

#### **Admission Requirements / Eligibility:**

Students must be registered in the MACS program to be eligible for this certificate.

#### **Certificate Requirements:**

Core course requirements (6 credit hours):

CSCI 5409.03

CSCI 5410.03

Electives (Pick 6 credit hours from the following courses):

CSCI 6408.03

CSCI 6505.03

CSCI 6515.03

CSCI 6612.03

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of the MACS degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Data Management**

**Offered by:** School of Information Management

#### **Coordinator:**

Sandra Toze

Suite 4010, Rowe Management Building

6100 University Ave

Sandra.Toze@dal.ca

902-494-2488

#### **Overview:**

The **Data Management Certificate** will recognize the particular knowledge, behaviours, skills, competencies and attitudes essential to working with data in a range of contexts and using a variety of tools. The goal of the certificate is to provide students with the foundations of data management, as they relate to a number of different context, types of data, as well as expose students to modern data analysis and visualization tools. Skills related to data, including data literacy and management have become core to knowledge work, and this Certificate allows student to demonstrate their fluency with data.

#### **Admission Requirements / Eligibility:**

MI certificates are limited to students enrolled in the Master of Information (MI) program at Dalhousie University. Each of our certificates requires completion of three Elective Courses (9 Credits). During their degree, MI students can choose to complete up to two Certificates. If an elective course is included in one Certificate, it cannot be counted towards another. The electives within the Certificates will count toward both the Certificate and the Degree.

#### **Certificate Requirements:**

In order to satisfy the requirements of this certificate, student must complete 3 of the following 4 courses:

- INFO 6270.03 Introduction to Data Science
- INFO 6513.03 Business Analytics and Data Visualization
- INFO 6681.03 Geospatial Information Management
- INFO 6290.03 Managing Research Data

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

# Certificate in Data Science

**Offered by:** Faculty of Computer Science

**Coordinator:** Dr. Vlado Keselj (Director of MDI), vlado@cs.dal.ca

## Overview:

The Certificate in Data Science draws on an interdisciplinary collection of courses from computer science, management, and statistics. It aims to educate students on an array of data science and statistical methods, models, and tools and position them to be able to draw conclusions from data reliably and robustly with quantification of all uncertainties, and promote reproducibility of the results.

Students who complete the certificate will be prepared to:

- 1) Implement and use a variety of data science and statistical methods, models, and tools to leverage technological and management advances in digital business and e-commerce;
- 2) Show an awareness of conditions for applicability and failure of data science and statistics tools;
- 3) Demonstrate a thorough understanding of how to quantify uncertainties associated with particular methods; and
- 4) Understand the conditions for applicability and failure of data science and statistic tools in the context of digital business, assess the impact of technology, business, and policy related issues.

## Admission Requirements / Eligibility:

Students must be registered in the Master of Digital Innovation (MDI) program to be eligible for this certificate.

## Certificate Requirements:

Core course requirements (9 credit hours):

STAT 5620.03

CSCI 6409.03

CSCI 6505.03

Electives (Pick 6 credit hours from the following courses):

INFO 6513.03

INFO 6681.03

STAT 5130.03

STAT 5350.03

STAT 5390.03

STAT 5550.03

CSCI 6405.03

CSCI 6406.03

CSCI 6509.03

CSCI 6515.03

CSCI 6612.03

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of the MDI degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Digital Business**

**Offered by:** Faculties of Computer Science, Management and Law

**Coordinator:** Christian Blouin, cblouin@dal.ca, (902) 401-6334

#### **Overview:**

The Certificate in Digital Business draws on interdisciplinary courses from management, computer science, and law. It aims to educate students to be leaders in digital transformation and innovation giving them the skills to work at the intersection of business and technology in areas such as e-commerce, data and business analytics, social media analytics, and legal aspects of e-commerce.

Upon completion, students will be able to:

- 1) Leverage technological and management advances in digital business and e-commerce.
- 2) In the context of digital business, assess the impact of technology, business, and policy related issues.
- 3) Acquire specialist competencies and more in-depth knowledge of at least one of three areas of digital business at a post-graduate level of depth.

#### **Admission Requirements / Eligibility:**

Limited to students currently enrolled in the Master of Digital Innovation (MDI) program.

#### **Certificate Requirements:**

Core course requirements:

ECMM 6000.03: Overview of Electronic Commerce

Electives (Pick 9 credit hours from the following courses)

ECMM 6014.03: Data Mining for Electronic Commerce

ECMM 6022.03: IT Project Management

ECMM 6026.03: E-Government; IT; Intern'l Exp&Per

ECMM 6068.03: Internet and Media Law

CSCI 6610.03: Human Computer Interaction

CSCI 6509.03: Natural Language Processing

CSCI 6505.03: Machine Learning

CSCI 6612.03: Visual Analytics

BUSI 6511.03: Business Process Integration ERP

BUSI 6513.03: Business Analytics

BUSI 5902.03: Starting Lean

BUSI 6002.03: New Venture Creation

**Application of Credit Hours Towards Other Degree Requirements: {Pick one, based on double-counting structure}**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Foundations of Applied Data Based Computing**

**Offered by:** Faculty of Computer Science

**Coordinator:** Dr. Raghav V. Sampangi (MACS Program Director), raghav@cs.dal.ca

**Overview:**

This certificate recognizes a student's ability to collaboratively develop and manage large-scale software based on industry best practices, for data analysis in a cloud computing environment. The certificate also recognizes the student's ability to communicate technical information from that analysis. It represents the completion of the Master of Applied Computer Science (MACS) core courses as a steppingstone towards the completion of the full MACS program.

Following this certificate, students will expand on their base knowledge through their electives and, depending on the student, through another MACS specialization certificate.

Students who complete the certificate will be prepared to:

- 1) Demonstrate competence in English with respect to technical communications, including report writing and oral presentations;
- 2) Demonstrate competence in data management and analysis of both structured and unstructured data, specifically, new data base paradigms, data mining and data analytics in a cloud computing environment; and
- 3) Demonstrate competence in the programming, design, and implementation of large-scale software systems on modern technology platforms.

**Admission Requirements / Eligibility:**

Students must be registered in the Master of Applied Computer Science (MACS) program to be eligible for this certificate.

**Certificate Requirements:**

Core course requirements (9 credit hours):

CSCI 5100.03

CSCI 5308.03

CSCI 5408.03

**Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of the MACS degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## Certificate in Foundations of Digital Innovation

**Offered by:** Faculty of Computer Science

**Coordinator:** Dr. Vlado Keselj (Director of MDI), vlado@cs.dal.ca

### Overview:

This certificate recognizes a student's ability to appreciate the implications of technology in areas of management and law and to apply that technology in a way that transforms the operations of an organization. It represents the completion of the Master of Digital Innovation (MDI) core courses as a steppingstone towards the completion of the full MDI program.

Following this certificate, students will expand on their base knowledge through their electives and, depending on the student, through another MDI specialization certificate.

Students who complete the certificate will be prepared to:

- 1) Manage change engendered by digital innovation;
- 2) Apply ethical guidelines and principles in the context of technology-based innovation;
- 3) Develop knowledge to assess, acquire and maintain data for the purpose of decision-making; and
- 4) Innovate using digital technology.

### Admission Requirements / Eligibility:

Students must be registered in the Master of Digital Innovation (MDI) program to be eligible for this certificate.

### Certificate Requirements:

Elective Group 1 (Pick 3 credit hours from the following courses):

ECMM 6000.03

HINF 6101.03

DGIN 5201.03

Elective Group 2 (Pick 6 credit hours from the following courses):

DGIN 5100.03

DGIN 5200.03

DGIN5300.03

DGIN5400.03.

### Application of Credit Hours Towards Other Degree Requirements:

Courses completed as part of this certificate may be double counted towards the requirements of the MDI degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

# Certificate in Health Informatics

**Offered by:** Faculties of Computer Science, Management and Law

**Coordinator:** Christian Blouin, [cblouin@dal.ca](mailto:cblouin@dal.ca), (902) 401-6334

## Overview:

The certificate in Health Informatics aims to train students in the world of health informatics, giving them the skills to develop and use information technology to create a better healthcare system. Health informaticians work in an interdisciplinary environment incorporating computer science, medicine, health, nursing, and business knowledge to improve healthcare and health outcomes.

Upon completion of this certificate, students are expected to:

1. Demonstrate an understanding of healthcare systems and issues in Canada and Internationally
2. Model health information flow in the real world and demonstrate knowledge of how to implement and effect change
3. Apply health informatics principles to healthcare systems to facilitate decision support and clinical care
4. Evaluate the scientific literature for academic rigor, particularly within the health informatics framework
5. Express health informatics principles and values to non-health informaticians
6. Practice health informatics ethically in the context of practice change
7. Produce meaningful health analytics from existing healthcare data

## Admission Requirements / Eligibility:

Limited to students currently enrolled in the Master of Digital Innovation (MDI) program.

## Certificate Requirements:

Core course requirements:

HINF 6101.03: Health Information Flow and Use

HINF 6110.03: Health Information Systems and Issues

HINF 6230.03: Knowledge Management for Health Informatics

Electives (Pick 6 credit hours from the following courses)

HINF 6102.03: Health Information Standards and Use

HINF 6210.03: Databases and data Mining for Health Informatics

HINF 6020.03: Research Methods

## Application of Credit Hours Towards Other Degree Requirements:

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

# Certificate in Healthcare Law for Non-Lawyers

**Offered by:** School of Health Administration, Faculty of Health

**Coordinator:** Michael R. Hadskis, [michael.hadskis@dal.ca](mailto:michael.hadskis@dal.ca), (902) 494-2534

## Overview:



Individuals and institutions involved in the provision of healthcare services in Canada must be able to effectively navigate a complex body of law that defines their legal rights and responsibilities. The Healthcare Law Certificate for Non-lawyers provides awareness of these rights and responsibilities and furnishes strategies for dealing with legal issues arising in the healthcare context. It also equips students to be informed consumers of legal information and offers the skills needed to contribute to law reform initiatives aimed at creating a more inclusive, equitable, fair, and effective healthcare system.

This Certificate would benefit individuals who participate in Canadian healthcare delivery in a wide variety of capacities, such as healthcare providers, healthcare administrators in public and private institutions, health policy makers, and government employees working in health-related departments and agencies.

The Certificate is awarded on completion of three core courses that are available online.

On completion of the Certificate, students should be able to:

1. understand the structure of the Canadian legal system;
2. appreciate the role of courts, legislatures, and administrative agencies in regulating healthcare;
3. analyze court decisions, legislation, and constitutional documents to determine legal rights and responsibilities;
4. apply legal principles to healthcare delivery situations;
5. perform basic legal research related to healthcare issues;
6. evaluate the fairness and efficacy of laws regulating healthcare; and
7. create and present a research paper on legal issues in the healthcare realm.

**Note:** The Certificate is not intended to train students to perform the functions of legal counsel. Only lawyers are permitted to practice law and must be consulted when legal issues arise. Instead, the Certificate aims to provide insight into how the law works in the healthcare delivery context and to elucidate the role lawyers, judges, legislators, and members of administrative tribunals play in this context.

#### **Admission Requirements / Eligibility:**

Admission is open to anyone who meets the Faculty of Graduate Studies minimum admission requirements. Professional experience is not needed for admission. Individuals who have completed any undergraduate program (e.g., arts, science, commerce, economics, etc.) are welcome to apply. Applicants are not required to write an entrance exam.

#### **Certificate Requirements:**

Core course requirements:

HESA 6360.03 Healthcare Law

HESA 6361.03 Business Law in the Healthcare Context

HESA 6362.03 Advanced Healthcare Law

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Information Management and Policy**

**Offered by:** School of Information Management

**Coordinator:**

Sandra Toze

Suite 4010, Rowe Management Building

6100 University Ave

### **Overview:**

The **Information Management and Policy Certificate** will recognize the particular knowledge, behaviours, skills, competencies, and attitudes considered critical to working in a broad range of Information Management and Information Policy contexts. The goal of the certificate is to provide students with the foundations of knowledge regarding the foundation of information management within a range of workplaces, as well as the key policy and legislative frameworks required to ensure privacy and security. Managing information, data and knowledge has become central to all organizations. The suite of courses within this Certificate is designed to develop the knowledge, skills, and guiding principles to professionally manage information and data as corporate assets.

### **Admission Requirements / Eligibility:**

MI certificates are limited to students enrolled in the Master of Information (MI) program at Dalhousie University. Each of our certificates requires completion of three Elective Courses (9 Credits). During their degree, MI students can choose to complete up to two Certificates. If an elective course is included in one Certificate, it cannot be counted towards another. The electives within the Certificates will count toward both the Certificate and the Degree.

### **Certificate Requirements:**

In order to satisfy the requirements of this certificate, student must complete the following core courses:

- INFO 6370.03 Records Management
- INFO 6400.03 Knowledge Management

As well as 1 of the following 3 courses:

- INFO 6090.03 Culture of Privacy
- INFO 6100.03 Information in Public Policy and Decision Making
- INFO 6610.03 Information Policy

### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Legal Aspects of Health Administration**

**Offered by:** School of Health Administration

**Coordinator:** healthadmin@dal.ca, (902) 494-7097

### **Overview:**

The purpose of the MHA+ Certificate in Advanced MHA Studies: Legal Matters in Health Administration is to provide MHA students with advanced knowledge of the myriad legal matters in healthcare administration. The Certificate is not a free-standing, nor an entry-level credential. Certificate recipients can neither practice law nor represent themselves to imply the right or competence to practice law.

### **Admission Requirements / Eligibility:**

This certificate is only open to students enrolled in the Master of Health Administration (MHA) prior to Fall 2021 who are completing the MHA program requirements as detailed in the 2020/2021 (or previous) calendar.

### **Certificate Requirements:**

Core course requirements:

HESA 6360.03: Healthcare Law

HESA 6361.03: Business Law for Health Administrators

HESA 6362.03: Advanced Healthcare Law

HESA 6366.015: Health Law and Policy: Current Issues I

HESA 6367.015: Health Law and Policy: Current Issues II

**Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## Certificate in Librarianship

**Offered by:** School of Information Management

**Coordinator:**

Sandra Toze

Suite 4010, Rowe Management Building

6100 University Ave

Sandra.Toze@dal.ca

902-494-2488

**Overview:**

The **Librarianship Certificate** will recognize the particular knowledge, behaviours, skills, competencies, and attitudes considered critical to success within the Library sector. The Librarianship Certificate aims to help students explore the theories, principles, and practices of modern librarianship. The foundations of modern librarianship rest on essential core values that reflect the history and ongoing developments in the practice. This certificate will prepare students with the application of standards, and bibliographic classification systems, while examining trends and future directions of relevant theories of learning and a consideration of how these approaches may be effectively managed for to engage communities. This certificate is reflective of a range of library settings including academic libraries, public libraries, and special libraries.

**Admission Requirements / Eligibility:**

MI certificates are limited to students enrolled in the Master of Information (MI) program at Dalhousie University. Each of our certificates requires completion of three Elective Courses (9 Credits). During their degree, MI students can choose to complete up to two Certificates. If an elective course is included in one Certificate, it cannot be counted towards another. The electives within the Certificates will count toward both the Certificate and the Degree.

**Certificate Requirements:**

In order to satisfy the requirements of this certificate, students must complete 3 of the following 4 courses:

- INFO 6330.03 Cataloguing and Classification
- INFO 6500.03 Community-Led Services
- INFO 6560.03 Information Resources Management

- INFO 6810.03 Managing Information Literacy Instruction

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Librarianship - Youth and Childrens Services**

**Offered by:** School of Information Management

#### **Coordinator:**

Sandra Toze

Suite 4010, Rowe Management Building

6100 University Ave

Sandra.Toze@dal.ca

902-494-2488

#### **Overview:**

The **Librarianship - Youth and Children's Services Certificate** will recognize the particular knowledge, behaviours, skills, competencies, and attitudes considered critical to becoming a Youth or Children's Librarian. Research indicates the vital role libraries play in the intellectual and social development of children. The Youth and Children's Services Certificate focusses on understanding the range of tools, processes, and resources necessary to meet the ongoing needs of children and youth within modern libraries. The courses are designed to allow students to explore the key foundations of providing information-based services to children and youth, including understanding the role of pleasure reading, and reading practices, as well as fostering an interest in technology.

#### **Admission Requirements / Eligibility:**

MI certificates are limited to students enrolled in the Master of Information (MI) program at Dalhousie University. Each of our certificates requires completion of three Elective Courses (9 Credits). During their degree, MI students can choose to complete up to two Certificates. If an elective course is included in one Certificate, it cannot be counted towards another. The electives within the Certificates will count toward both the Certificate and the Degree.

#### **Certificate Requirements:**

In order to satisfy the requirements of this certificate, students must complete the following 3 courses:

- INFO 6070.03 Reading and Reading Practices
- INFO 6250.03 Services and Resources for Young Adults
- INFO 6450.03 Services and Resources for Children

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Medical Physics**

**Offered by:** Department of Physics & Atmospheric Science, Faculty of Science

**Coordinator:** James Robar, james.rob@nshealth.ca, (902) 473-6017

**Overview:**

The certificate program in Medical Physics is designed for those who hold a PhD in physics and would like to qualify for admission to medical physics residency training programs. The program consists of one year of core coursework delivered as part of Dalhousie's CAMPEP accredited master's program in Medical Physics.

**Admission Requirements / Eligibility:**

Completion of a PhD in physics granted by a university in recognized standing. Normally the specialization of the PhD will be in a branch of physics other than medical physics.

**Certificate Requirements:**

Core course requirements:

PHYC 6400.03: Medical Imaging Physics (Part I)

PHYC 6410.03: Medical Imaging Physics (Part II)

PHYC 6416.00: Seminars in Medical Physics

PHYC 6421.03: Radiological Physics

PHYC 6423.04: Radiation Therapy Physics

PHYC 6424.03: Special Topics in Medical Physics

PHYC 6430.03: Radiation Biology

PHYC 6431.03: Radiation Safety and Protection in Medicine

PHYC 6450.03: Computational Methods in Medical Physics

Students are typically expected to complete eight courses over two terms (September through April).

## Certificate in Mental Health and Addictions

**Offered by:** School of Social Work, Faculty of Health

**Coordinator:** mha@dal.ca, (902)494-6899

**Overview:**

This certificate is an interdisciplinary program administered by the School of Social Work. The certificate was developed to provide working professionals with the latest knowledge, skills and attitudes required to improve the lives of persons affected by mental health and addictions challenges.

The courses are fully online; however, they are centered around a team-based approach to learning and encourage discussion and interaction with instructor and classmates. Assignments are focused on helping students apply knowledge to real-world situations they encounter in their working life.

**Admission Requirements / Eligibility:**

All applicants must meet the Faculty of Graduate Studies minimum admission requirements. In addition, applicants must have completed at a minimum an undergraduate degree program in one of the following fields or equivalent\*:

- Nursing
- Social Work
- Occupational Therapy

- Recreation Therapy
- Pharmacy
- Health Promotion
- Clinical Psychology
- Medicine

Those with four-year Bachelor degrees in other programs (e.g., Education, Law) are also welcomed to apply but are required to provide detail in their cover letter and resumé explaining how their education and work experience relate to the area of mental health and addictions, and how pursuing this certificate would support their work in this field.

#### **Certificate Requirements:**

Core course requirements:

HLTH 5110.03 Mental Health and Addictions Services and Systems

HLTH 5120.03 Mental Health, Substance Use and Addiction Across Health Practices: Working with Persons, Families and Communities

HLTH 5130.03 Concurrent Disorders and Complex Case Work: Working with Persons, Families and Communities

HLTH 5140.03 Prevention, Early Intervention and Population Focused Health Promotion

Additional Requirements: HLTH 5110.03 must be completed first. Students wishing to take more than one course concurrently must obtain permission from the coordinator.

#### **Application of Credit Hours Towards Other Degree Requirements:**

All certificate requirements must normally be completed above and beyond any other Dalhousie degree requirements. Tuition fees will be assessed for these courses on a per-course fee basis above and beyond the tuition of a student who is concurrently enrolled in another degree program at Dalhousie.

## **Certificate in Ocean Data Science**

**Offered by:** Faculty of Computer Science

**Coordinator:** Dr. Luis Torgo, ltorgo@dal.ca

#### **Overview:**

The Certificate in Ocean Data Science provides computer science students with an opportunity to specialize their MCS or PhD with an understanding of data and machine learning relevant in the ocean ecosystem. The certificate provides students with the opportunity to understand data relevant to fisheries, aquaculture, logistics, security, defence, ports, marine energy, and other ocean industries. At the same time, students learn the fundamentals of machine learning approaches as well as other components of the data science workflow (e.g., data pre-processing, hyperparameter tuning, feature selection), as they apply to data types common in the ocean domain (e.g., streaming sensor data, acoustic data, trajectory data).

Students who complete the certificate will be prepared to:

- 1) Demonstrate and apply data science and machine learning fundamentals;
- 2) Understand, use, and manage relevant ocean related data types and structures; and
- 3) Apply data science and machine learning to problems within the ocean sector.

#### **Admission Requirements / Eligibility:**

Students must be registered in the Master of Computer Science (MCS) program or PhD in Computer Science program to be eligible for this certificate.

#### **Certificate Requirements:**

Core course requirements:

CSCI 6408.03

Elective Group 1 (Pick 6 credit hours from the following courses):

CSCI 6505.03

CSCI 6515.03

CSCI 6516.03

Elective Group 2 (Pick 3 credit hours from the following courses):

CSCI 6055.03

CSCI 6405.03

CSCI 6406.03

CSCI 6505.03\*

CSCI 6514.03

CSCI 6515.03\*

CSCI 6516.03\*

CSCI 6610.03

CSCI 6612.03

\*only if taken above and beyond the 6-credit hour elective group 1 requirement.

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of the MCS or PhD degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Professional Development (FGS)**

**Offered by:** Faculty of Graduate Studies / Center for Learning and Teaching

**Coordinator:** Mabel Ho

#### **Overview:**

This Certificate aims to provide support for the increasingly diverse career paths and trajectories of graduate students and post-doctoral fellows. Through a complimentary training approach that recognizes professional development opportunities both inside and outside of a student/fellow's normal activities at Dalhousie, this certificate focuses on development mapping and articulation of the value of the skills gained in their studies.

#### **Overall Professional Development Skills Certificate Outcomes:**

- articulate competencies to potential employers
- develop intentional career mapping plans and create actionable plans directed to future professional goals
- practice personal reflection and identify personal strengths

#### **Admission Requirements / Eligibility:**

Please refer to the certificate's website for application procedures. The certificate is open to all current graduate students and post-doctoral fellows.

#### **Certificate Requirements:**

There are four components to the Certificate: 1) two core workshops (one on values identification and the other on professional identity); 2) workshops ranging across four thematic pillars (practicing communication skills, cultivating career intelligence, strengthening health and wellness, and developing leadership qualities); 3) experiential learning opportunities associated with the four pillars; and 4) reflective writing and preparing a short portfolio.

The Certificate framework begins and ends with the Core Workshops offered by the Program Coordinator that enable participants to situate their proposed and completed learning. Completion of all four Program Components is necessary to obtain the Certificate. The Certificate is designed to be completed within one year but may be completed during a longer duration of a degree/fellowship. The Program Coordinator will assess the participants' work and a grade of pass/fail will be granted according to predetermined standards for learning outcomes.

An on-going list of available workshop and professional development opportunities will be published regularly on the certificate's website.

## **Certificate in Public Management and Environmental Readiness**

**Offered by:** School of Public Administration (joint with School of Resource and Environmental Studies and School of Information Management)

**Coordinator:** Markus Sharaput (sharaput@dal.ca / 902-494-3844)

#### **Overview:**

The objective of this new Certificate is to create new and leading-edge opportunities for Faculty of Management graduate students to address matters of environmental sustainability and information management in the context of public management. The initiative also responds to growing market demands and competitive pressures for such an offering.

#### **Admission Requirements / Eligibility:**

The Certificate will be offered to students currently enrolled in the Master of Public Administration (MPA), Master of Information (MI), and Master of Resource and Environmental Management (MREM) programs. As such students will have met the admission requirements for one of these programs as a pre-condition of taking the certificate.

#### **Certificate Requirements:**

Core Courses (18 credit hours):

PUAD 5100.03 Organizational Design for Governance and Public Management

PUAD 5120.03 Introduction to Public Policy

ENVI 5504.03 Management of Resources and the Environment

ENVI 5505.03 Biophysical Dimensions of Resource and Environmental Management

INFO 5500.03 Information in Society

INFO 6540.03 Data Management

Note, two of the six certificate courses are already required as part of the eligible programs. Students from the MPA, MI or MREM programs who wish to pursue the certificate will, in addition to their existing program requirements, take 4 "out of program" courses as electives.

#### **Application of Credit Hours Towards Other Degree Requirements:**



Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## Certificate in Registered Nurse Prescribing

**Offered by:** Faculty of Health, School of Nursing

**Coordinator:** Dr. Marilyn Macdonald, Marilyn.macdonald@dal.ca

### Overview:

The Dalhousie University School of Nursing has developed this graduate level certificate educational program for RN prescribing that will prepare Registered Nurses to assume the expanded role enabled by the Framework for RN Prescribing in Canada developed by the Canadian Nurses Association (CNA). This certificate has been developed in collaboration with the Nova Scotia College of Nursing, IWK Health Centre, NSHA, and the Nova Scotia Department of Health and Wellness.

This certificate is intended to prepare RNs with the knowledge to deliver evidence-based practice in prescribing while further refining their clinical decision-making skills. It is also intended to provide RNs with opportunities to optimize their scope of practice and prepare them to prescribe safely and cost efficiently.

Upon completion, students will be able to:

- 1) Demonstrate competency in clinical decision making, driven by rigorous/trustworthy peer-reviewed evidence combined with patient/family choice and ability
- 2) Extend and optimize their current scope of practice by learning to safely and efficiently prescribe, enabling them to meaningfully contribute to meeting the needs of patients

### Admission Requirements / Eligibility:

Undergraduate degree in Nursing or Diploma

RN License in the Province of NS

Minimum GPA of 3.3 on a Dalhousie grade scale

Baccalaureate prepared nurses must have a minimum of three (3) years of continuous clinical practice in an employer-designated area of clinical practice. Diploma prepared nurses must have a minimum of four (4) years' experience in a designated area.

Employer sponsored request for enrolment – Nurses applying to the certificate program will be required to provide a letter from the Program Director (Nova Scotia Health Authority or IWK Health Centre) requesting that the applicant be considered for admission and outlining the program intent to sponsor and to support RN prescribing in the designated area where the applicant is practicing. The Associate Director Graduate Studies, School of Nursing, will confirm the letter of support with the signatory.

### Certificate Requirements:

Core course requirements:

NURS 5740.03 Advanced Health Assessment

NURS 5736.03 Pharmacotherapeutics for Registered Nurse (RN) Prescribing (P)

NURS 5630.03 Integrated Professional Practicum for Registered Nurse (RN) Prescribing (P)

### Application Process:

Submit online application and application fee: [https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission\\_requirements/admission\\_process.html](https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission_requirements/admission_process.html)

Request official transcripts of all post-secondary education be sent to Dalhousie University (Dalhousie transcripts are not required)

Submit resume (including RN license number) to [graduate.nursing@dal.ca](mailto:graduate.nursing@dal.ca)

Request letter of support (see above) from Program Director to be sent to [graduate.nursing@dal.ca](mailto:graduate.nursing@dal.ca)

Application Deadline: Complete applications to be submitted by mid-November. Please check the department's website for exact deadlines.

### Application of Credit Hours Towards Other Degree Requirements:

Courses completed as part of this certificate may be counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor/advisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## Certificate in Strategic Decisions in Health Administration

**Offered by:** School of Health Administration, Faculty of Health

**Coordinator:** healthadmin@dal.ca, (902) 494-7097

### Overview:

The purpose of this certificate is to provide interested Master of Health Administration (MHA) students with advanced knowledge of the science of decision-making. The Certificate is neither a freestanding nor an entry-level credential.

### Admission Requirements / Eligibility:

This certificate is only open to students enrolled in the Master of Health Administration (MHA) prior to Fall 2021 who are completing the MHA program requirements as detailed in the 2020/2021 (or previous) calendar.

### Certificate Requirements:

Core course requirements:

HESA 6100.03: Ethical Decisions in Health Administration

HESA 6341.03: Management and Union Relations: Decisions and Implementation

HESA 6345.03: Healthcare Leadership: Decisions, Ownership & Accountability

HESA 6400.03: Executive Decisions: The Dynamics of Bias, Risk & Persuasion

### Application of Credit Hours Towards Other Degree Requirements:

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## Certificate in Translational Neurotechnology 1

**Offered by:** Department of Psychology and Neuroscience, Faculty of Science

**Coordinator:** Aaron Newman, radiant@dal.ca

### Overview:

The NSERC CREATE-funded Rehabilitative and Diagnostic Innovation in Applied Neurotechnology (RADIANT) program will produce highly qualified personnel (HQP) who possess the skills, knowledge, and experience to bridge the existing gap between people with the scientific know-how to develop new neurotechnology applications, and those who have the knowledge and ability to bring them to market.

RADIANT offers certificates in Translational Neurotechnology (TNT1 and TNT2) designed to add value to a range of graduate degree programs at Dalhousie. Its aim is to provide both a scientific grounding in neurotechnology and clinical neuroscience, and the professional skills needed to work in translating scientific knowledge into products that benefit people. These include skills in the process of innovation, intellectual property, business, and communication. Graduates will be suited to jobs industrial and academic settings, designing solutions that meet real needs and commercializing or otherwise mobilizing these innovations.

TNT1 and TNT2 are designed to be completed sequentially, although some components of the TNT2 certificate may be completed prior to the awarding of the TNT1 certificate. Normally, it is expected that students will complete the TNT1 certificate during their Master's degree, and the TNT2 certificate during their PhD degree; other scenarios are possible how

### **Admission Requirements / Eligibility:**

The graduate certificate program is open to students enrolled in a graduate program at Dalhousie University. Students may come from programs in the Faculties of Science (including Psychology, Chemistry, Biology), Computer Science, Management (MBA), Medicine (including Anatomy and Neurobiology, Physiology & Biophysics, Pharmacology, and Biochemistry), Engineering (including the School of Biomedical Engineering), and Health Professions (including Audiology, Kinesiology, Occupational Therapy, Physical Therapy, Speech Pathology, and Clinical Vision Sciences).

### **Certificate Requirements:**

Core course requirements:

PSYO 7701.03 RADIANT Seminar

PSYO 7705.06 Summer Institute --- Neurotechnology Innovation, Commercialization, and Entrepreneurship (NICE)

Additional Requirements:

A thesis or research project supervised by at least one member of the RADIANT faculty and approved by the RADIANT Management Committee

Completion of at least one Professional development Workshop per year

### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Translational Neurotechnology 2**

**Offered by:** Department of Psychology and Neuroscience, Faculty of Science

**Coordinator:** Aaron Newman, [radiant@dal.ca](mailto:radiant@dal.ca)

### **Overview:**

The NSERC CREATE-funded Rehabilitative and Diagnostic Innovation in Applied Neurotechnology (RADIANT) program will produce highly qualified personnel (HQP) who possess the skills, knowledge, and experience to bridge the existing gap between people with the scientific know-how to develop new neurotechnology applications, and those who have the knowledge and ability to bring them to market.

RADIANT offers certificates in Translational Neurotechnology (TNT1 and TNT2) designed to add value to a range of graduate degree programs at Dalhousie. Its aim is to provide both a scientific grounding in neurotechnology and clinical neuroscience, and the professional skills needed to work in translating scientific knowledge into products that benefit people. These include skills in the process of innovation, intellectual property, business, and communication. Graduates will be suited to jobs industrial and academic settings, designing solutions that meet real needs and commercializing or otherwise mobilizing these innovations.

TNT1 and TNT2 are designed to be completed sequentially, although some components of the TNT2 certificate may be completed prior to the awarding of the TNT1 certificate. Normally, it is expected that students will complete the TNT1 certificate during their Master's degree, and the TNT2 certificate during their PhD degree; other scenarios are possible how

### **Admission Requirements / Eligibility:**

The graduate certificate program is open to students enrolled in a PhD program at Dalhousie University. Students may come from programs in the Faculties of Science (including Psychology, Chemistry, Biology), Computer Science, Management (MBA), Medicine (including Anatomy and Neurobiology, Physiology & Biophysics, Pharmacology, and Biochemistry), Engineering (including the School of Biomedical Engineering), and Health Professions (including Audiology, Kinesiology, Occupational Therapy, Physical Therapy, Speech Pathology, and Clinical Vision Sciences).

Admission to the TNT2 certificate normally requires TNT1 to have already been completed.

**Certificate Requirements:**

Core course requirements:

PSYO 7711.03 Innovating Neurotechnology I

PSYO 7712.03 Innovating Neurotechnology II

Additional Requirements:

A thesis or research project supervised by at least one member of the RADIANT faculty and approved by the RADIANT Management Committee

One-term internship with a RADIANT partner in industry, government lab or business development

Completion of at least one RADIANT approved Professional development Workshop per year

**Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## Certificate in User Centered Design

**Offered by:** School of Information Management

**Coordinator:**

Sandra Toze

Suite 4010, Rowe Management Building

6100 University Ave

Sandra.Toze@dal.ca

902-494-2488

**Overview:**

The **User-Centred Design Certificate** will recognize the particular knowledge, behaviours, skills, competencies, and attitudes considered critical to becoming a User-Centred Design Specialist. The goal of the certificate is to provide students with the foundations of knowledge regarding a human centred designing approach to services and tools. As organizations embrace digital platforms there is a growing need for skills related to the understanding the behaviour of users, and how to use this to information design. The suite of courses within the Certificate is designed to meet this need, and to develop within students an awareness of the principles of human centred design, based on an in-depth understanding of how humans interact and work with information, and best principles.

**Admission Requirements / Eligibility:**

MI certificates are limited to students enrolled in the Master of Information (MI) program at Dalhousie University. Each of our certificates requires completion of three Elective Courses (9 Credits). During their degree, MI students can choose to complete up to two Certificates. If an elective course is included in one Certificate, it cannot be counted towards another. The electives within the Certificates will count toward both the Certificate and the Degree.

**Certificate Requirements:**

In order to satisfy the requirements of this certificate, student must complete the following 3 courses:

- INFO 6630.03 User Experience
- INFO 6620.03 Web Design & Architecture
- INFO 6682.03 Human Information Interaction

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Certificate in Web and Mobile Computing**

**Offered by:** Faculty of Computer Science

**Coordinator:** Raghav Sampangi, Director MACS, raghav@cs.dal.ca

#### **Overview:**

The Certificate in Web and Mobile Development aims to create a focused pathway for students to develop core skills on web development, mobile development, and user experience design. It aims to educate students to be application developers with a strong foundation of developing user-centric web and mobile applications.

Upon completion of the certificate, you will:

- 1) Acquire competencies to develop digital applications with good user experiences.
- 2) Develop skills to transform customer needs and user needs into software requirements and architectures to develop web and mobile applications.
- 3) Acquire the skills to evaluate the necessary infrastructure to develop and implement scalable web and mobile applications.

#### **Admission Requirements / Eligibility:**

Admission is only open to students currently enrolled in the MACS program.

#### **Certificate Requirements:**

Core course requirements:

CSCI 5708.03 - Mobile Computing

CSCI 5709.03 - Advanced Topics in Web Development

CSCI 5601.03 - Designing for User Experience

Electives (Pick 3 credit hours from the following courses):

CSCI 5306.03 - Topics in Program Comprehension

CSCI 5409.03 - Advanced Topics in Cloud Computing

CSCI 6307.03 - Usable Security and Privacy

CSCI 6609.03 - Ubiquitous Computing

#### **Application of Credit Hours Towards Other Degree Requirements:**

Courses completed as part of this certificate may be double counted towards the requirements of a concurrent degree, subject to approval by the student's supervisor and graduate coordinator in their primary degree program. Courses not approved to count towards the primary degree requirements will result in additional tuition fees on a per-course fee basis.

## **Agriculture**

Location:  
Graduate Studies Office  
Cumming Hall  
Dalhousie Agricultural Campus  
PO BOX 550  
Truro NS  
B2N 5E3

Phone Number: (902) 893-6502  
Fax Number: (902) 893-3430  
Email Address: [gradadmissions.agr@dal.ca](mailto:gradadmissions.agr@dal.ca)  
Website: [www.dal.ca/faculty/agriculture/programs/graduate-studies.html](http://www.dal.ca/faculty/agriculture/programs/graduate-studies.html)

## Staff

### Dean and Principal

**Gray, D. R.**, PhD (Rhodes)

### Faculty Graduate Coordinator

**Price, G. W.**, [gprice@dal.ca](mailto:gprice@dal.ca)

### Graduate Program Assistant

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### Professors

**Asiedu, S. K.**, BSc (Agr), MSc, PhD (McGill), Plant, Food, and Environmental Sciences Department. Plant-microbe Interactions, Post-harvest physiology, pathology of horticultural crops, potato physiology, production management. Head

**Astatkie, T.**, BSc, MSc (Addis Ababa), PhD (Queen's), Engineering Department. Time series analysis, linear, nonlinear, and nonparametric regression, and design of experiments

**Burton, D. L.**, BSc (Dalhousie), MSc (Guelph), PhD (Alberta), Plant, Food, and Environmental Sciences Department. Soil biology and biochemistry, nutrient cycling, soil quality, climate change, greenhouse gases

**Clark, J. S.**, BA (Guelph), MSc (Saskatchewan), PhD (North Carolina State), Business and Social Sciences Department. Econometrics and time series analysis. Tests of competition under general equilibrium. Statistical and economic aspects of climate change

**Cutler, G. C.**, BSc (Memorial), MPM (SFU), PhD (Guelph), Plant, Food, and Environmental Sciences Department. Insect biology and ecology, insect toxicology, and development of ecologically sound and pragmatic insect pest management programs

**Duston, J.**, BSc (Bath), PhD (Aston), Animal Sciences and Aquaculture Department. Finfish Aquaculture and Environmental Physiology

**Fredeen, A. H.**, BSc (Saskatchewan), MSc (Guelph), PhD (Davis), Animal Sciences and Aquaculture Department. Ruminant nutrition, dairy systems analysis, milk composition, dairy products, greenhouse gas emission, pasture-based dairy production, sustainable, ecological organic dairying

**Grant, K. G.**, BA (Acadia), MA, PhD (Western), Business and Social Sciences Department. Agricultural commodity spot futures and options markets; macroeconomics

**Hoyle, J.**, BA (York), BA (Open Univ, UK), BEd (Dalhousie), MSc (Leeds), PhD (Dalhousie), Plant, Food, and Environmental Sciences Department. GC-MS, Organic Agriculture, Organosulfur Chemistry, Environmental Chemistry, River Studies, Innovative Teaching Methods

**Lada, R. R.**, BSc (Hort), MSc (Hort) (TNAU, Coimbatore), PhD (Adelaide), Plant, Food, and Environmental Sciences Department. Environmental stress physiology and metabolism. Biostress defense molecules, inter and intra-plant communication, environmental regulation of plant development, bulking physiology, resource competition modelling

**Lynch, D. H.**, BSc (Agr), MSc (Agr) (McGill), PhD (Guelph), Canada Research Chair in Organic Agriculture, Plant, Food, and Environmental Sciences Department. Organic production systems. Nutrient cycling in agro-ecosystems. Soil organic matter dynamics. Soil microbiology. Legume physiology. Composting and management of manures and organic wastes

**Nams, V. O.**, BSc (Toronto), MSc (Alta), PhD (Victoria), Plant, Food, and Environmental Sciences Department. Spatial scales, landscape ecology, fractal analysis, behavioural ecology, animal movement and mammals

**Olson, A. R.**, BA (Augustana), MSc (Wisconsin), PhD (Alta), Plant, Food, and Environmental Sciences Department. Botany. Mutualistic, commensal, and parasitic symbiotic relationships among flowering plants, anatomy of plant diseases, religious world views and their interaction with natural sciences, sexual reproduction of plants

**Patterson, D. L.**, BSc (Alberta), MSc, PhD (Guelph), Animal Sciences and Aquaculture Department. Biodiversity and Conservation of rare breeds

**Percival, D.**, BSc (Agr), MSc, PhD (Guelph), Plant, Food, and Environmental Sciences Department. Plant physiology and berry crop production. Environmental regulation of carbon assimilation and metabolism, water relations, soil fertility and plant nutrition and the subsequent impact on plant growth, development, yield, and composition

**Rupasinghe, H. P. V.**, BSc (Peradeniya), MSc (Iowa), PhD (Guelph), Canada Research Chair in Fruit Bioactives and Bio products. Plant, Food, and Environmental Sciences Department. Bio-products, functional foods, nutraceuticals, and natural health products; phytochemicals and human health; postharvest biotechnology, shelf-life, and quality

**Wang-Pruski, G.**, BSc (Tian Jin), PhD (Alberta), Plant, Food, and Environmental Sciences Department. Plant molecular biology and genomics, functional genomics, proteomics, potato genome and gene expression, genetic control of potato tuber quality, genetic and environmental interactions, biotechnology

**Yiridoe, E. K.**, BSc (Univ of Science and Technology, Ghana), MSc, PhD (Guelph), Business and Social Sciences Department.

Agricultural production economics, farm and agribusiness management and natural resource and environmental economics

**Zaman, Q.**, BSc, MSc (Univ of Agriculture Faisalabad), PhD (Univ of Newcastle upon Tyne), Engineering Department. Precision agriculture, GPS, GIS, Sensors, remote sensing, VPT

## Associate Professors

**Cameron, G. A.**, BA Hon (St. FX), MA (York), PhD (SOAS), Business and Social Sciences Department. Agrarian political economy, democratization transitions, the politics of East Africa, food security, co-operatives, Canadian agricultural policy

**Dukeshire, S. R.**, BComm, BA (St. Mary's), MAsc, PhD (Waterloo), Business and Social Sciences Department. Media framing of agriculture and aquaculture; dietary decision making

**France, R.**, BSc, MSc (Manitoba), PhD (Toronto), Plant, Food, and Environmental Sciences Department. Watershed management, limnology, eco forestry, conservation biology, land-use planning, environmental engineering, and BMP design

**Hartt, C. M.**, BA (Dalhousie), MBA, PhD (St. Mary's), Business and Social Sciences Department. Critical Management studies, Business history, Native American, Aboriginal, and Indigenous Persons in Organizational studies, Decision making, Acton-Network Theory, Critical Sense making, strategy

**Havard, P. L.**, BSc (Agr Eng), MSc, PhD (McGill), Engineering Department. Water and energy conservation, instrumentation and computer control, system modelling

**He, Q.**, BSc, MSc (ECUST, China), PhD (Western), Engineering Department, Biofuels, Nanocatalyst, separation of chiral molecules, crystallization, polymorphism of APIs

**Kevany, K.**, BA (Carleton), MEd, EdD (Toronto), Business and Social Sciences Department. Factors that mediate well-being, resiliency, prosperity, vibrancy, and sustainability. Theory and practice of mindfulness and positive psychology and how these enhance well-being. Systems analysis of implications of food choices and strategies to reduce climate change, improve health and increase well-being through production and consumption of whole foods

**Lu, J.**, BA (Renmin), MA (Beijing Normal), PhD (McGill), Business and Social Sciences Department. Consumer eating behavior. Dietary consumption decision making Agri-food business marketing. Public health policy on healthy eating

**Martynenko, A.**, BSc (Ukraine), MSc (Moscow), PhD (Guelph), Engineering Department. Multi-scale bioinstrumentation, real-time imaging, computer vision, food processing technologies, process engineering

**Myles, S.**, BA (St. Thomas), MSc (Oxford), PhD (Leipzig), Plant, Food, and Environmental Sciences Department. Agricultural Genomics, with emphasis on apples and grapes

**Nguyen-Quang, T.**, BSc (Eng), MSc (Grenoble), PhD (Mediterranean), PhD (Eng) (Montreal), Engineering Department. Mathematical models for biological processes, biofluids and biosystems modeling, fluid dynamics and transfer phenomena in soils and water, PIV method

**Niu, H.**, BEng (Xi'an Univ Arch Tech, China), MEng, PhD (Memorial), Engineering Department. Fate and transport of contaminants in the environment, watershed modeling and management, irrigation, drainage and water table management, effects of climate change on agriculture water resources

**Price, G. W.**, BSc (UBC), MSc, PhD (Guelph), Engineering Department. composting, nutrient management, waste management, soil organic matter dynamics, soil nitrogen dynamics

**Prithiviraj, B.**, BSc (Agr) (Annamalai), MSc, PhD (BHU), Plant, Food, and Environmental Sciences Department. Plant stress physiology, marine bio-products in animal and plant health, plant-microbe interactions, plant pathology, natural anti-infective compounds

**Russell, S. G.**, BSc (Agr) (Guelph), MBA (St. Mary's), PhD (Bradford), Business and Social Sciences Department. Micro and small enterprise management including strategic marketing, financial management, human resource management and operations management. Family business issues such as succession and financing. Entrepreneurship in international settings, including international project management

**Stewart-Clark, S.**, BSc (Hon), MSc, PhD (UPEI), Animal Sciences and Aquaculture Department. Shellfish aquaculture, shellfish molecular biology and genomics, shellfish gene expression under environmental stressors, aquatic invasive species, aquatic ecology, invasive tunicate genetics, population genetics, biotechnology

**Yurgel, S.**, MSc (St. Petersburg Polytechnic), PhD (RIAM, Russia), Plant, Food, and Environmental Sciences Department. Plant-microbe interaction, plant microbiome

## Assistant Professors

**Abbey, L.**, BSc (Ghana), MSc (Imperial), PhD (Cranfield), Plant, Food, and Environmental Sciences Department. Horticulture, new and under-utilized crops, compost, bio-stimulants, abiotic stress physiology and plant bioactives

**Adewole, D.I.**, B.Sc Agr (OAU, Ile-Ife, Nigeria), MSc, PhD (Manitoba), Animal Sciences and Aquaculture Department. Poultry Nutrition and Sustainable Antibiotic Reduction in Poultry Production

**Al-Malachi A.**, BSc Eng (Jordan University of Science and Technology), MSc, PhD (Hokkaido University), Engineering Department, Sensing and automation, Biosystems Engineering, Smart agriculture

**Barrett, D. M. W.**, BSc (Memorial), MSc, PhD (Saskatchewan), Animal Sciences and Aquaculture Department. Ruminant reproduction, endocrinology, gonad, seasonality, puberty, and controlled breeding

**Chang, Y.**, BSc, MSc, PhD (Seoul National), Engineering Department. Bio-systems automation, Image processing, smart camera, microcontroller, FPGA/System-On-Chip (SOC), and real-time bio-system modeling

**Clark, K.F.**, BSc (Dalhousie), MSc (Queen's), PhD (UPEI), Animal Sciences and Aquaculture Department. Molecular Immunology

**Collins, S.**, BSc, MSc, PhD (Saskatchewan), Animal Sciences and Aquaculture Department. Animal nutrition, novel feed ingredients, insects as food feed, nutritional modeling

**Colombo, S.**, BSc (Guelph), MSc (Dalhousie), PhD (Memorial), Animal Sciences and Aquaculture Department. Aquaculture nutrition and production, fatty acid biosynthesis in fish, nutrigenomics, nutrient metabolism in fish, farmed seafood nutritional quality

**Esau, T.**, BEng, MSc, PhD (Dalhousie), PEng, PAg, Engineering Department. Mechanized systems, agricultural machinery, sustainable farming

**Hammermeister, A. M.**, BSc (Saskatchewan), MSc, PhD (Alberta), Plant, Food, and Environmental Sciences Department. Organic agriculture and organic cropping systems, soil fertility and management, land reclamation, cropping systems; cereals, oilseeds, and small bush fruits

**McLean, N.**, BSc (Agr), MSc (Macdonald), PhD (Dalhousie), Plant, Food, and Environmental Sciences Department. Plant genetics and field crop management

**Miar, Y.**, BSc, MSc (Tehran), PhD (Alberta), Animal Science and Aquaculture Department. Animal breeding and genomics, computational genomics, genomic selection, bioinformatics, genetic evaluation, and improvement of animals

**Parsons, L. D.**, BSc, DVM (Atlantic Veterinary College), Animal Science and Aquaculture Department. Companion Animal Veterinary Medicine, Shelter medicine, Feral cat Health and Welfare, veterinary technician education

**White, S. N.**, BSc, MSc (NSAC), PhD (Guelph), Plant, Food, and Environmental Sciences Department. Weed science, vegetation management, plant ecology, plant biology

## Adjunct (FGS)

**Anderson, D.**, BSc, MSc (Manitoba), PhD (Saskatchewan)

**Boyd, N.**, BSc, MSc (Dalhousie), PhD (Manitoba)

**Corcadden, K. W.**, BEng (Bolton, UK), MSc, PhD (UMIST, UK), PEng (APENS), CEng (IET)

**De Koeyer, D.**, BSc (Agr) (Guelph), MSc, PhD (Minnesota)

**Fraser, A.**, BSc (SFU), MSc (Guelph), PhD (SFU)

**Goyer, C.**, BSc, PhD (Sherbrooke)

**Hillier, K.**, BScH, PhD (Memorial)

**Murray, G. B.**, BSc (Agr) (Dalhousie/NSAC), MBA (St. Mary's), MSc (McGill), PhD (Dalhousie)

**Norrie, J.**, BSc (Mt. A), MSc (Dalhousie), PhD (Laval)

**Papadopoulos, Y. A.**, BSc, MSc, PhD (Guelph), MBA (St. Mary's)

**Schumann, A. W.**, BSc, MSc (Univ of Natal), PhD (Georgia)

**Stratton, G. W.**, BSc, MSc, PhD (Guelph)

## Adjunct (Retired)

**Caldwell, C. D.**, BSc (Mt. A), MSc (Dalhousie), PhD (East Anglia)

**Farid, A. H.**, BSc, MSc (Shiraz), PhD (Alta)

**Pruski, K. W.**, BSc (Warsaw), MSc (Alberta), PhD (Wageningen)

## Admission

The Dalhousie Agricultural Campus has facilities for advanced study and research leading to an MSc in Agriculture.

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. All inquiries for admission should be addressed to:



The Graduate Studies Office  
Dalhousie Agricultural Campus  
PO Box 550  
Truro, NS B2N 5E3

Students may apply to begin the program in January, May, or September.

Please refer to the [Admission Dates](#) section for final dates for receipt of application for admission.

## Master of Science (MSc) Degree Program

Graduate students attend courses at Dalhousie Agricultural Campus in Truro and, on occasion, supplement their program with courses at the Halifax campus. Students may choose to concentrate their studies in any of the following areas:

### **Agribusiness, Agricultural Economics and Rural Studies:**

Consumer Behaviour; Agribusiness and Management; Food Demand; Production Economics; Resource and Environmental Economics; Rural Development; Agriculture, Food and Well Being; Professional Practice

### **Bioresources and Environmental Sciences:**

Waste Management, Environmental Microbiology, Ecology, Pest Management, Agricultural Systems, Resource Management, Food Science, Agricultural Chemistry, Soil Chemistry, Nutrient Management, Soil Fertility, Soil Conservation, Soil Management, Bioproduct Science, Environmental Stress Physiology, Entomology, resource economics

### **Animal Science:**

Nutrition, Animal Behaviour, Genetics and Breeding, Animal Product Technology, Physiology, Animal Management, Aquaculture (Shell-Fish and Fin-Fish culture)

### **Plant Science:**

Cropping Systems Management, Plant Genetics, Nutrition, Pathology, Physiology, Biotechnology, Horticulture

### **Mechanized Systems:**

Precision Agriculture, Mechanical Systems, Sensing and Automation, Innovative Processing Equipment, On-Farm Alternative Energy Production, Real-Time Data Processing, Water Management Systems

The MSc in Agriculture program is research centred and a student will not receive final acceptance until a supervisor has been identified. All students must complete a research thesis embodying original contribution in the thesis field of study. The thesis is defended at an oral examination.

Students are required to take a minimum of four graduate courses (3 credit hours each). The graduate course AGRI 5700.03: Communication Skills and Graduate Seminar is a required course. The remaining courses are selected by the student in consultation with his or her supervisor.

In addition, students must complete a teaching assistantship in the laboratory of at least one undergraduate course in order to gain knowledge and experience in classroom instruction, must present at one Graduate Research Day, and must be admitted to candidacy within the first four to six months of their program.

### **Scholarships and Financial Aid**

A number of scholarships are available to students in the MSc Agriculture Program. Consult the link at [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca) or [Awards](#)

## Doctor of Philosophy (PhD) Degree Program

**Core Courses:** Students without MSc degrees have the same course requirement as MSc students. All PhD students must complete the AGRI6700: Research Methods Course in the first year of study and the AGRI6705: Advanced Research Seminar in the second or third years of study.

**Ancillary and Audit Courses:** Additional courses or activities may be required as part of the program of study at the discretion of the Supervisory Committee. Supervisors may have additional course or program requirements, within the FGS guidelines, appropriate to that particular discipline. Normally, students would not take more than three courses in addition to the required research methods and research seminar courses. In addition, doctoral students will complete a teaching assistantship (paid positions) in two half-credit courses at the undergraduate level of study.

**Comprehensive (Preliminary) Exam and Thesis Proposal:** Students will prepare and defend a thesis proposal within one year of their commencement in the program and undertake a preliminary exam, or comprehensive, within thirty (30) months of entering the program and at least one year prior to the thesis defense. Required coursework, with the exception of AGRI6705 Research Seminar, must be completed before a student may take their preliminary examination.

**Residency:** Students are required, as part of their Graduate Student Program, to be on campus for at least six terms (including the summer terms).

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

Graduate courses are intended only for students registered in the graduate program and may be taken by undergraduate students only under exceptional circumstances, where they meet normal MSc admission requirements. Graduate students in programs other than the MSc Agriculture wishing to take AGRI courses should contact the Graduate Studies Office, Dalhousie Agricultural Campus.

## Course Descriptions

### AGRI 5230 Directed Studies in Environmental Sciences

CREDIT HOURS: 3

This course aims to provide to graduate students an opportunity for detailed study and critical thinking in an environmental sciences research area of interest. Through individual study and research, with guidance and instruction provided by a professor, students will leave the course with comprehensive knowledge of a contemporary topic(s) in the discipline, with improved skills in comprehension, problem formulation, writing/communication, and critical thinking.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

FORMATS: Lecture | Discussion

### AGRI 5250 Soil Microbiology

CREDIT HOURS: 3

This course is designed to provide an intensive study of the microbiology of soils and will emphasize nutrient cycling and biodegradation. Topics covered include the relationships between the abiotic and biotic components of soils; the microbial biochemistry of the carbon, nitrogen, sulphur, phosphorus, and selected micronutrient cycles; heavy metal cycling; and the microbial degradation of industrial wastes and pesticides. The laboratory classes will concentrate on techniques to monitor the microbial biomass in soil and the microbial components of nutrient cycles. These include new advances in bacterial taxonomy and identification, and the use of gas chromatography and high-performance liquid chromatography in quantitating nutrient cycling. In addition to a major term paper, a comprehensive laboratory report on the entire term's lab work, and a single take-home examination, graduate students will be required to: modify the term give a seminar to the class on their term paper topic paper into a critical review of some aspect of soil microbiology, chosen in consultation with the instructor (the review must be current and in depth; it must be written in manuscript format and will be graded accordingly) perform additional laboratory exercises not assigned to undergraduate students, use more replicates, perform a full statistical analysis of data, and provide a report in manuscript format

CROSSLISTED: MICA 4000.03

### **AGRI 5260 Special Topics in Plant Pathology**

CREDIT HOURS: 3

This course will be custom designed to meet the specific needs of graduate students specializing in the area of plant pathology who need further specific knowledge and/or skills.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of instructor and Faculty Graduate Coordinator

### **AGRI 5270 Economic Entomology**

CREDIT HOURS: 3

Insect pest management in agriculture with emphasis on a selection of non-chemical approaches to insect control, e.g., natural, mechanical, physical, cultural, biological, biochemical, and/or legal control. According to the student's interest, a section on chemical control can be included. This course is consistently in accord with the theory and principles of integrated pest management (IPM); consequently, the term assignments will incorporate the study of sampling techniques and monitoring methods of insect pests and related beneficial arthropods. Attendance at certain relevant seminars may be required and directed readings may be assigned.

CALENDAR NOTES: Winter semester—A case history of a major agricultural insect pest will be prepared to satisfy the course requirement. The material will be submitted in term paper format and also delivered in an oral presentation. The case history will include the life

FORMATS: Lecture | Tutorial

### **AGRI 5280 Directed Studies in Pest Management**

CREDIT HOURS: 3

This course aims to provide to graduate students an opportunity for detailed study and critical thinking in a pest management research area of interest. Through individual study and research, with guidance and instruction provided by a professor, students will leave the course with comprehensive knowledge of a contemporary topic(s) in the discipline, and with improved skills in comprehension, problem formulation, writing/communication and critical thinking.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

FORMATS: Lecture | Discussion

### **AGRI 5310 Special Topics in Applied Ethology**

CREDIT HOURS: 3

Course content will vary. Topics covered will be chosen so as to meet the requirements of individual graduate students. Aspects could include the assessment of farm animal welfare, foraging behaviour, environmental enrichment, social dynamics of livestock, and early rearing environment and the effect on later behaviour.

CALENDAR NOTES: Fall or Winter semester

### **AGRI 5320 Special Topics in Animal Nutrition**

CREDIT HOURS: 3

The course is designed to provide an opportunity to study specific aspects of animal nutrition. Aspects could include study of a particular nutrient, a process in nutrition, a nutritional state, or nutrient metabolism of a specific species, with focus on the research method. Students are advised to consult with their supervisors to determine the specific scope of the topic to be studied.

CALENDAR NOTES: Fall, Winter or Summer semester

### **AGRI 5340 Special Topics in Animal Physiology**

CREDIT HOURS: 3

This course is for students with a major interest in animal physiology. The course will consist of discussions, term papers, and presentations. Students will be expected to nominate topics for consideration and to prepare major reviews and class presentations of selected topics.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

### **AGRI 5350 Animal Research Methods**

CREDIT HOURS: 3

This course is designed for students who have an interest in the methodology and ethics of animal research. The course will include consideration of some of the common or promising laboratory, experimental and field methods associated with animal research, ethics of animal research, and the analysis, interpretation, and reporting of results. Students will be expected to participate in exercises, to contribute to discussions, and to present reviews on various

aspects.

CALENDAR NOTES: Fall semester

### **AGRI 5360 Protein Nutrition**

CREDIT HOURS: 3

A study of the sources, availability, and metabolism of protein and amino acids for the domestic animal. Subjects addressed include sources of protein, factors affecting digestibility of protein, digestion and absorption of protein and nitrogen, urea recycling, individual amino acid metabolism, excretion of nitrogenous wastes in birds and mammals, and protein and amino acid requirements of animals.

CALENDAR NOTES: Winter semester

### **AGRI 5365 Vitamins in Animal Nutrition**

CREDIT HOURS: 3

Vitamins and vitamin-like compounds are discussed in relation to the normal function of the animal. Vitamin metabolic interrelationships, assessments of adequacy, treatments of deficiency, and sources both natural and synthetic are addressed for all vitamins. Current literature relating to each vitamin as bioactive molecules is discussed.

CALENDAR NOTES: Winter semester

### **AGRI 5370 Special Topics in Animal Breeding and Genetics**

CREDIT HOURS: 3

Provides students with an opportunity to pursue more detailed studies in animal breeding and genetics. Topics will be decided on by the student in consultation with faculty members for the purpose of meeting the student's specific needs as defined by the thesis research. Delivery will be a combination of directed reading and tutorial discussions.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

### **AGRI 5380 Quantitative Genetics**

CREDIT HOURS: 3

An introduction to quantitative genetics theory and to statistical techniques used in domestic animal improvement. Computing and statistical techniques will be demonstrated and presented, and relevant literature will be surveyed. Reference will be made throughout to performance recording programs used in Canada and around the world.

CALENDAR NOTES: Winter semester

### **AGRI 5390 Molecular Genetic Analysis of Populations**

CREDIT HOURS: 3

This course is designed to give graduate students some understanding of the theoretical aspects of population and molecular genetics. Various DNA fingerprinting techniques (e.g., minisatellites, microsatellites, RAPD-PCR, FRLP-PCR and SSCP-PCR, and their applications in population genetic studies) will be discussed. Students will acquire hands-on experience with some of these techniques. Analysis of molecular data to estimate interpopulation populations (heterozygosity, Hardy-Weinberg equilibrium) and interpopulation parameters (test of heterogeneity of allele frequency distributions, genetic distances, phylogenetic analysis, bootstrapping, F-statistics) will be covered.

CALENDAR NOTES: Fall or Winter semester

### **AGRI 5400 Directed Studies in Soil Science**

CREDIT HOURS: 3

This course aims to provide to graduate students an opportunity for detailed study and critical thinking in a soil science research area of interest. Through individual study and research, with guidance and instruction provided by a professor, students will leave the course with comprehensive knowledge of a contemporary topic(s) in the discipline, and with improved skills in comprehension, problem formulation, writing/communication, and critical thinking.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

FORMATS: Lecture | Discussion

### **AGRI 5450 Environmental Soil Chemistry**

CREDIT HOURS: 3

The course is designed to provide an opportunity to study specific aspects of environmental soil chemistry. Topics may include the chemical composition of soils with special attention to soil biochemistry, and soil organic matter with an emphasis on organic matter/clay interactions, soil organic N, P, and S, and soil enzymology. Graduate students will be expected to participate in lecture/discussion sessions and complete required reading assignments. In addition, graduate students will be required to complete research papers and present their findings at in-class seminars.

CALENDAR NOTES: Winter semester— Minimum enrollment: 10 students

CROSSLISTED: SOIL 4000

### **AGRI 5460 Special Topics in Soil and Water Management**

CREDIT HOURS: 3

This course will discuss the state-of-the-art soil and water management practices in either humid or arid regions, depending on the specific needs of the graduate students. Topics may include fundamentals of soil and water properties; drainage and water table control; management of farm irrigation and draining systems; salinity control; irrigation water requirements; drainage requirements for humid and arid regions; soil conservation; and computer modelling of irrigation and drainage systems. Guest speakers will be invited to share their experiences with the students.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

### **AGRI 5480 Directed Studies in Analytical Instrumentation**

CREDIT HOURS: 3

This course aims to provide graduate students with an opportunity for detailed study and critical thinking in specific areas of analytical instrumentation as it relates to their research area. Through individual study and research, with guidance and instruction provided by a professor, students will leave the course with comprehensive knowledge of a contemporary topic(s) in the discipline, and with improved skills in comprehension, problem formulation, writing/communication, and critical thinking.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

FORMATS: Lecture | Discussion

### **AGRI 5505 Applied Genomics & Bioinformatics**

CREDIT HOURS: 3

Genetics and analysis of quantitative traits in farm animals and crop plants. Detecting, locating and measuring the effects of quantitative trait loci (QTL).

Recent developments in QTL mapping and genomic selection. The course is designed to provide students with the depth of knowledge and specialized skills required to apply bioinformatics tools to practical problems in the life sciences. The laboratory sessions include hand on experience in using commonly used software for analyzing data from breeding and genomics experiments. While not required, a course in Animal or Plant Breeding and at least two courses in Statistics are helpful preparation for this course.

PREREQUISITES: Consent of Instructor

EXCLUSIONS: GENE 4005.03

FORMATS: Lecture | Tutorial

### **AGRI 5510 Special Topics in Plant Breeding**

CREDIT HOURS: 3

This course is designed to meet the specific needs of graduate students specializing in the area of Plant Breeding who need further specific knowledge and/or skills.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

### **AGRI 5520 Plant Breeding Methods**

CREDIT HOURS: 3

Genetic and statistical principles underlying modern plant breeding methods are introduced. Those principles will be reinforced through the use of computer models. Cultivar development techniques for self and cross-pollinated species are examined in detail. Applications of tissue culture, genetic engineering, and marker-facilitated selection are discussed. This course is open to students who have had introductory courses in genetics, plant breeding, statistics, and molecular biology.

CALENDAR NOTES: Fall semester

### **AGRI 5530 Nitrogen in Crop Production**

CREDIT HOURS: 3

Students will study the transformations of N in air, soil, water, and plants, and consider crop requirements for N. Topics include the chemistry of N, the N cycle, N transformations in soil, N metabolism in plants, N transport in plants, N-fixation, N losses in agricultural systems, and an evaluation of N fertilizer in these systems.

CALENDAR NOTES: Next offered in 2016/2017

### **AGRI 5540 Special Topics in Crop Physiology (A)**

CREDIT HOURS: 3

This course is designed to meet the specific needs of graduate students specializing in the area of Crop Physiology who need further specific knowledge and/or skills.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

### **AGRI 5560 Advanced Crop Physiology**

CREDIT HOURS: 3

Physiological processes relevant to crop plant development and production of harvestable yield will be examined.

CALENDAR NOTES: Summer semester

### **AGRI 5570 Special Topics in Agricultural Biotechnology**

CREDIT HOURS: 3

This course is designed to meet the specific needs of graduate students specializing in the area of Agricultural Biotechnology who need further specific knowledge and/or skills.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

### **AGRI 5610 Special Topics in Animal Product Technology**

CREDIT HOURS: 3

This course will review areas important in the technology of foods derived from animals (meat, fish, eggs, milk). Such areas could include chemistry (lipid oxidation, Maillard reactions), physics (changes caused by freezing, sol-gel conversion, colour) and microbiology (spoilage, pathogenic organisms, modified-atmosphere packaging, HACCP). Each student will be expected to present a review of a particular topic.

CALENDAR NOTES: Fall semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

### **AGRI 5620 Ruminant Digestive Physiology and Metabolism**

CREDIT HOURS: 3

This course is designed to provide an intensive study of food intake and digestion, and nutrient absorption and metabolism, in the ruminant animal. The course details current knowledge and focuses on aspects of future research interest. Students are expected to contribute to discussions and present reviews to the class on various aspects of the subject.

CALENDAR NOTES: Fall semester

PREREQUISITES: NUTR 3000, CHMA 3006

CROSSLISTED: NUTR 4000

FORMATS: Lecture | Lab

### **AGRI 5630 Intermediate Statistical Methods**

CREDIT HOURS: 3

Analysis of single-factor experiments, randomized blocks, latin squares, and factorial and two-level fractional factorial designs.

CALENDAR NOTES: Fall semester

PREREQUISITES: STAA 3000.03, or permission of the instructor

CROSSLISTED: STAA 4000.03

FORMATS: Lecture | Lab

### **AGRI 5650 Applied Weed Science**

CREDIT HOURS: 3

This is a lecture and laboratory-based course designed to introduce students to the advanced principles of weed science and vegetation management. The course will build upon the foundation created in BIOA3002 and is designed to provide students with the knowledge and skills critical for competency and knowledge generation in the field of weed science. Emphasis will be placed on crop-weed competition, managing weeds in annual and perennial cropping systems, determining the fate of herbicides in plants and soils, knowledge of herbicide mode of action and injury symptomology, examination of herbicide application technology, approaches to trouble shooting when field scouting, and management of aquatic weed species.

PREREQUISITES: BIOA 3002

EXCLUSIONS: ENVA 4003

FORMATS: Lecture | Lab

### **AGRI 5660 FOOD MICROBIOLOGY**

CREDIT HOURS: 3

This course is designed to teach students basic and advanced aspects of the microbiology of foods. A combination of lectures and laboratory exercises will be used to provide students with a theoretical and practical knowledge of food microbiology. The focus will be on the role of microorganisms in quality, safety, preservation, and shelf life of food products. The occurrence and prevalence of foodborne pathogenic microorganisms will be examined. Food associated microbiomes and emerging food pathogens will be discussed. Methods to detect food related microorganisms will be compared and quality assurance and sanitation strategies to control the microbiological quality and safety of foods will be discussed. Laboratory portion of the course will incorporate molecular biology techniques for detection of food-related microorganisms and fermentation processes including wine and soft cheese preparation. Discussion of specific examples of microbial processes in food will be incorporated.

EXCLUSIONS: MCRA 4001

FORMATS: Lecture | Lab

### **AGRI 5661 MICROBIOMES IN AGRICULTURE**

CREDIT HOURS: 3

This course is to provide students with an understanding of diversity and function of microbial communities in soil, water, and food. The students will be introduced to various concepts of plant- and animal- microbiome and the role microbial populations in host health and fitness. Application of microbiomes in food industry will be discussed. The theory of metagenomics approaches to culture independent microbial community profiling will be discussed. The students will work on analysis of current publications on the subject and develop research project on the evaluations of microbial communities in environmental niches

EXCLUSIONS: MCRA 4002

FORMATS: Lecture | Lab | Tutorial | Seminar

### **AGRI 5700 Communication Skills and Graduate Seminar**

CREDIT HOURS: 3

Through practical assignment, students will be able to test and develop their communication skills. Topics will include review, criticism, and writing of journal papers, grant applications, posters, seminars, lectures, and interviews. This course is required for students enrolled in the M.Sc. in Agriculture program.

CALENDAR NOTES: Fall and Winter semesters – Enrollment per term may be capped.

### **AGRI 5705 Module Course**

CREDIT HOURS: 3

This course normally consists of three modules. Each module consists of one month of lectures (approximately 8 to 12 hours of direct contact time) and additional assignments dealing with a topic in the lecturer's area of expertise. Research interests of incoming students are taken into account each year when module topics are solicited. Students should not apply to take a module unless they have at least a second-year undergraduate background in the focus area. A formal evaluation is made at the end of each module.

CALENDAR NOTES: Students registering for this module course must complete three modules over their program for full course credit. Until all three modules are completed the course will register as 'In Progress'. A final mark will be assigned once all modules have been completed.

FORMATS: Experiential Learning

### **AGRI 5720 Applied Statistics and Experimental Design for Agriculture**

CREDIT HOURS: 3

This course is designed to provide practical skills in statistical methods and experimental designs, and an appreciation of situations when more complex models and methods are required. Topics include linear and nonlinear regression, split-plot designs, repeated measures, and response surface methods. Students will be expected to successfully complete practical exercises and a project involving real experimental problems and data sets. Students will also be expected to acquire proficiency in at least one advanced statistical software package.

CALENDAR NOTES: Winter semester

PREREQUISITES: STAA 4000.03, AGRI 5630.03, or equivalent

### **AGRI 5730 Directed Studies in Food and BioProduct Science**

CREDIT HOURS: 3

This course aims to provide to graduate students an opportunity for detailed study and critical thinking in a food and bioproduct research area of interest. Through individual study and research, with guidance and instruction provided by a professor, students will leave the course with comprehensive knowledge of a contemporary topic(s) in the discipline, and with improved skills in comprehension, problem formulation, writing/communication and critical thinking.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: Permission of the instructor and Faculty Graduate Coordinator

FORMATS: Lecture | Discussion

### **AGRI 5740 Advanced Studies in Food Chemistry**

CREDIT HOURS: 3

This course is designed to allow graduate students to explore in detail various aspects of the chemical nature of agri-food products. This may include, but is not limited to, a study of naturally occurring components (functional foods and nutraceuticals), nutritional changes during value added processing, and product formulation. The exact focus of the course will depend on the expressed interest of students in the course.

CALENDAR NOTES: Fall or Winter semester

PREREQUISITES: One undergraduate food science course or equivalent

FORMATS: Lecture | Discussion

### **AGRI 5750 Biotechnology**

CREDIT HOURS: 3

This course is to provide students with general information on the theory and technologies that are currently used in biotechnology. Course topics will include gene identification, transformation and expression regulations, tissue culture and cell culture techniques, and other genomics-related agricultural applications. Nutraceutical and pharmaceutical applications will also be discussed.

CALENDAR NOTES: Fall semester

PREREQUISITES: GENE 2000 or equivalent

CROSSLISTED: GENE 4003

FORMATS: Lecture

### **AGRI 5770 Mathematical Modelling for Biosystems**

CREDIT HOURS: 3

Mathematical modelling of biosystems, including deterministic and probabilistic models used in soils research, water management, plant and animal science and food production will be covered. Relationships between empirical/experimental data, suggested prediction models, solving and validating mathematical models will be included, using modelling techniques of relevance to the life sciences and engineering.

PREREQUISITES: MTHA 1001.03, STAA 2000.03 or equivalent

CROSSLISTED: MTHA 4000.03

FORMATS: Lecture | Lab

### **AGRI 5780 Agriculture, Food and Well-being**

CREDIT HOURS: 3

This course develops learners' understanding and skills in criticality, synthesizing, and systems thinking through the examination of local and global issues in agriculture, food, and well-being. The intersections of agricultural systems and policies, animal and plant science, food production and processing, etc., and the social sciences are investigated to obtain a deeper understanding of systems that support agriculture, food, and well-being.

PREREQUISITES: AGRI 1001.03

CROSSLISTED: AGRI 4001.03

FORMATS: Lecture

### **AGRI 5781 Advanced Topics in Consumer Behavior**

CREDIT HOURS: 3

The study of consumer research attempts to explain and predict how humans think and behave in consumption situations. Beyond its business management implementation, a deep understanding of consumer behaviour is critical knowledge for making many, if not all, social changes and can be



applied to many research areas, such as public health, economics, policy making, and community development. Built on studies from marketing, psychology and economics literature, this course systematically introduces students to advanced consumer behaviour theories. This course provides students with a comprehensive and in-depth understanding of current conceptual and methodological development in the field of consumer research. Specifically anchored to the agri-food sector and applicable to broader consumption behaviors, the discussions include food-related attitudes, motivations, values, and preferences, as well as issues related to healthy eating and food business ethics.

FORMATS: Lecture

### **AGRI 5782 Research Design for Agribusiness Research**

CREDIT HOURS: 3

An appropriate study design is critically important to gather evidence for the answers to research questions. With examples of evidence-based research in the field of business management, this course will introduce the concept and principle of some intermediate level research designs, as well as their strengths and weaknesses. Based on the research topic of their theses, students will explore options for designing a research protocol including appropriate qualitative and/or quantitative data collection and analytical strategies. They will also learn strategies to mitigate weakness of the certain study design, to manage sampling bias, and to critically evaluate published research results. Although the focus of this course is for business management studies, the principle is generally applicable to economics and social sciences studies, particularly in the fields related to agri-food issues.

FORMATS: Lecture

### **AGRI 5783 Food Demand**

CREDIT HOURS: 3

This course will apply advanced economic theory to the analysis of food demand, systems, and policy. Students will learn how economic theory can be applied to measuring food demand and how theory can be applied to understanding such issues as food subsistence, food poverty and food security. In addition, several trends in food demand will be discussed, including the internationalization of consumer tastes, the rise in demand for food away from home, further processed food, food waste, functional food, local food, etc. Analysis of various food taxes will also be discussed, including their effects on health and well-being.

FORMATS: Lecture

### **AGRI 5784 Production Economics**

CREDIT HOURS: 3

The purpose of this course to introduce graduate students to theoretical and applied models and techniques used to investigate firm level production economics decisions.

FORMATS: Lecture

### **AGRI 5785 Reflection and Contemplation in Professional Practice**

CREDIT HOURS: 3

The goal of this course is to explore meditative and contemplative tradition in various schools of thought, cultures, and spiritual traditions. This includes comparing and contrasting with mechanistic and rationalistic schools of thought. We will consider the diverse methods across the ages and in Eastern and Western thought. The course involves a review of worldviews and philosophies that form community and societal norms and mores and the evidence revealing how reflective and contemplative practices mediate professional practice. This course will enable learners to become aware of challenges with and benefits from reflective and contemplative practices.

FORMATS: Discussion

### **AGRI 6700 Advanced Research Methods**

CREDIT HOURS: 3

This course will present an introduction to the philosophy of science and the scientific method. Students will examine the historical development of knowledge within their area of specialization. The student will explore access to, and use of, the published literature in the development of a research question. Students will consider the means by which they observe, document, and analyze subjects in their area of specialization and through discussion/presentation with other students in the course and invited speakers appreciate how this is undertaken in other fields. The importance of being able to assess and document data quality and the maintenance of data archives and the publishing of datasets will be considered.

FORMATS: Lecture | Seminar | Discussion

### **AGRI 6800 Advanced Graduate Seminar**

CREDIT HOURS: 3

This course is one of the two required courses in the PhD in Agricultural Sciences program. We will examine the methods of enquiry and develop advanced communication skills. As part of the course requirement students will complete a program requirement of presenting their research outcomes through an

oral presentation at the Faculty of Agriculture Research Day. In class seminar presentations will also be conducted by students participating in the class.  
FORMATS: Lecture | Seminar | Discussion | Online Delivery

### **AGRI 9000 Graduate Thesis**

CREDIT HOURS: 0

CALENDAR NOTES: Students register for this course when they are engaged in research work for credit towards the M.Sc. in Agriculture degree.

### **AGRI 9530 Doctoral Thesis**

CREDIT HOURS: 0

Students in the PhD Program must be registered in this course in every term.

## **Architecture**

Location:

School of Architecture  
5410 Spring Garden Road

PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3973  
Fax Number: (902) 423-6672  
Email Address: [grad.arch@dal.ca](mailto:grad.arch@dal.ca)  
Website: [dal.ca/architecture](http://dal.ca/architecture)

## **Introduction**

The School of Architecture, which is part of the Faculty of Architecture and Planning at Dalhousie University, was established in 1961 to serve the Atlantic region. While it continues to fulfill its original mandate, the School also contributes nationally and internationally to architecture through its dynamic faculty and committed student body. Its primary aim is to educate individuals who intend to become professional architects. The School's professional degree program includes the two-year Bachelor of Environmental Design Studies degree and the two-year Master of Architecture degree. Most of the program is conducted within the School of Architecture by full-time faculty members. It also includes two co-op work terms in which students gain practical experience in an architectural office. The curriculum enables architectural education and practice to develop in parallel.

### ***Design***

The central activity of the professional degree program is architectural design: the creative study of buildings and cities. In the School's design studios, students examine historical and contemporary buildings in Canada and abroad and respond through the design of new architectural projects. From the core studies of the undergraduate program to the elective studies and design thesis of the graduate program, students learn to rely on their artistic skill, their knowledge of history and technology, their social and cultural awareness, and their critical imagination. Architecture is a multi-disciplinary profession, with alliances to the fine arts, the humanities, and technologies. Many undergraduate disciplines provide an effective entry into architecture. Conversely, architectural studies provide an excellent foundation for careers in a variety of design-related fields.

### ***Facilities***

The School is located in the original home of the Nova Scotia Technical College, built in 1909 and renamed the Ralph M. Medjuck Building in 2005. Corresponding to the School's emphasis on architectural design, one-third of the building is devoted to studio spaces that are open to students 24 hours a day. Faculty facilities include computer labs, wood shop, digital modeling lab, photo studio, printing lab, and a large exhibition hall. The University Library's architecture collection is located nearby.

### ***Co-op Work Terms***

The School's professional degree program includes two work terms that provide students with practical experience in building design and responsible professional practice. The School's Co-op Program has been operating since 1970, and the Faculty of

Architecture and Planning's Co-op Office assists students in finding suitable work term placements. In recent years, Architecture students have been employed in every province and territory in Canada, and approximately one-third have chosen to work abroad - most recently, in Australia, China, Germany, Japan, Mexico, Netherlands, South Africa, Sweden, United Kingdom, United States, and Zambia.

### ***Accreditation***

The School's Master of Architecture program is fully accredited by the Canadian Architectural Certification Board (CACB). The entire six-year program consists of two years of general studies at a recognized university, followed by two years of undergraduate study at the School of Architecture (BEDS) and two years of graduate study at the School of Architecture (MArch).

In Canada, the Canadian Architectural Certification Board (CACB) is the sole agency authorized by the Canadian Architectural Licensing Authorities (CALA) to accredit Canadian professional degree programs in architecture for the purposes of architectural licensure.

### ***Professional Registration***

After receiving the professional degree, a graduate may fulfill additional requirements for professional registration, including a period of post-graduate practical experience and the completion of registration examinations. In Canada, these additional requirements are determined by provincial organizations that are empowered to register an individual for professional practice. An American citizen who graduates from the School's MArch program is qualified to become an architectural intern in the United States and to complete the examination for professional registration there. Applicants from other countries are advised to contact their national architectural organization about requirements for professional registration.

## **Staff**

### **Director, School of Architecture**

**Burnay, D.**, DiplArch (Tech Univ Lisbon), MSc (Arch) (Univ College London)  
Telephone: (902) 494-4128, Email: [diogo.burnay@dal.ca](mailto:diogo.burnay@dal.ca)

### **Undergraduate Secretary, School of Architecture**

**Morash-Kent, S.**, BA, BEd, MEd (St. Mary's)  
Telephone: (902) 494-3971, Email: [arch.office@dal.ca](mailto:arch.office@dal.ca)

### **Graduate Secretary, School of Architecture**

**Hatcher, H.**, BA (St F.X.), MA (Memorial)  
Telephone: (902) 494-3973, Email: [grad.arch@dal.ca](mailto:grad.arch@dal.ca)

### **Director of Career Services, Faculty of Architecture and Planning**

**Firth, J.**, BSc, MBA (St. Mary's)  
Telephone: (902) 494-6201, Email: [joanne.firth@dal.ca](mailto:joanne.firth@dal.ca)

### **Undergraduate and Graduate Coordinator, School of Architecture**

**Parcell, S.**, BArch (Toronto), MArch (Cranbrook), PhD (McGill)  
Telephone: (902) 494-3908, Email: [parcell@dal.ca](mailto:parcell@dal.ca)

### **Professors**

**Bonnemaïson, S.**, BSc (Concordia), BArch (Pratt), MSc(Arch) (MIT), PhD (UBC). Lightweight and tensile structures, motion studies in architecture, architectural installations, temporary urbanism of festivals, responsive environments, and electronic textiles for architectural applications.

**Cavanagh, E.**, BSc, BArch (McGill), PhD (Lehigh). Architectural design (teaching and practice); scholarship in coastal planning and history of technology; production of design-build projects for coastal communities, focusing on innovative construction methods.

**Macy, C.**, BA(Arch) (Calif at Berkeley), MArch (MIT), Reg Arch (WA). History, theory and criticism of modern architecture, representation of cultural identity in architecture, urban systems and infrastructure, temporary urbanism, lightweight and ephemeral architecture.

**Mannell, S.**, BES, BArch (Waterloo), FRAIC, NSAA. Sustainable design, education for sustainable development; building construction; public works architecture, post-war modern architecture, 1970s ecological architecture, contemporary architectural criticism.

**Parcell, S.**, BArch (Toronto), MArch (Cranbrook), PhD (McGill). Architectural theory and interpretation; historical definitions of architecture; interdisciplinary alliances with architecture; history and theory of architectural representation.

## Associate Professors

**Burnay, D.,** DiplArch (Tech Univ of Lisbon), MSc(Arch) (Univ College London). Design practice in public architecture, contemporary architecture in the public realm, architectural tectonics.

**Forren, J.,** BA (Wesleyan), MArch (MIT), Reg Arch (Mass), NCARB. New materials in architecture, high performance building systems, digital design and construction technologies, interdisciplinary design practices, human-environment interface, affective architecture, interactive public art.

**Lilley, B.,** BES (Manitoba), AA Dipl. Responsive architecture, material research and computation, public interest design, psychogeography.

**Savage, N.,** BA (Alberta), BEDS, MArch (TUNS), NSAA. Residential and public buildings, affordable housing; alternative housing models, hard-to-house populations, and therapeutic housing environments.

**Venart, C. A. S.,** Cert. Eng. (Mt. A), BFA (Toronto), MArch (SCI-Arc), AK NWF (prof. reg. Germany). Experiential, spatial, and phenomenological methods of documenting, representing, and analyzing site, architecture, urban and natural environments; private design practice; multi-disciplinary design strategies for urban and architectural competitions and projects; publication and exhibition design.

## Assistant Professors

**Dainese, E.,** BA(Arch), MArch, PhD (IUAV, Italy), OAPPC. History, theory and criticism of modern architecture, architectural and landscape design, endemic paradigm, and African design

**Fitzgerald, S.,** BSc (Univ College London), BID (Kwantlen), BEDS (TUNS), MArch (Dalhousie), PhD (Univ College London), NSAA, AAA, AANB, IDNS, FRAIC. Design practice in institutional, civic, residential, and design-build architecture; research in spatial and social dynamics of cities, productive urban landscapes, and comparative models of practice.

**Mullin, R.,** BEDS, MArch(FP) (TUNS). Detailing and significance of materials; landscape and buildings in coastal environments; community partnerships; design-build; representation in documentation, design, and construction.

**Parsons, A.,** BSc (McGill), MES (Dalhousie), SMBT (MIT). Built heritage conservation, window design, building performance, design-craft interface.

**Putman, M.,** ArchTechDip (Loyalist), BAS, MArch (Carleton), PgDip (Univ College London), ARB, RIBA. Design/materiality interventions in urban fabrics/landscapes; design-making methodology applied to building techniques; prototyping/design-build.

**Sweetapple, T.,** BA (Dalhousie), BEDS, MArch (TUNS), FRAIC. Cultural, academic, and residential projects; innovative learning environments, material culture, and comprehensive design.

**Verissimo, C.,** Dipl. Arch (Technical Univ Lisbon), MArch II (Harvard). Design practice in private and public buildings, urban design, and architectural tectonics; research in sustainable materials and eco-efficiency in building construction.

## Senior Instructor

**Jannasch, E.,** BEDS (TUNS), MArch (Dalhousie). Teaching in architecture; visual reasoning; systems thinking; film, architecture, and virtual reality; structural form; non-funicular masonry; history and future of fabrication; labour, work, and craft; the utilitarian vernacular.

## Adjunct (FGS)

**Arquero de Alarcón, M.,** Prof. arch. (Madrid), MASLA (ETH Zurich), MLAUD (Harvard), DEA (Poly Madrid), COAM (Spain), ASLA, APA; Univ. of Michigan.

**Braithwaite, P.,** BA (UBC), BEDS, MArch (Dal), NSAA

**Carter, B.,** DiplArch (Nottingham), MArch (Toronto); SUNY Buffalo

**Cormier, A.,** BSc(Arch), BArch (McGill), CEA Architecture Urbaine (Paris-Villemin); Univ. de Montréal

**Corson, J.,** BEDS, MArch (TUNS), NSAA

**Crace, J.,** BSc (Dal), BEDS, BArch (TUNS), NSAA

**Gallaugh, D.,** BFA (OCAD), BEDS, MArch (Dal), NSAA

**Goodz, D.,** BSc, BArch (McGill)

**Henry, P.,** BEDS, BArch (TUNS), NSAA

**Hill, R.,** BComm, BEDS, MArch (Dal), NSAA

**Kam, K.,** BSc (Dal), BEDS (TUNS), MEd (MSVU)

**Kawar, R.,** BA(Arch), MArch (Calif at Berkeley), NSAA, AIA

**Mandeville, J.,** BEng (Memorial), BEDS, MArch (Dal), NSAA

**Nycum, B.,** BEDS, MArch (TUNS), NSAA

**Reed, J.,** BA (Univ. of King's College), MDiv (Atlantic School of Theology)

**Robertson, K.,** BEDS, MArch (TUNS), NSAA

**Stotts, E.,** BArch (Rice), AIA, NSAA

**Thompson, K.**

**Trumble, C.,** BSc(Arch) (Illinois), MArch (Penn), AIA

**Wiedemann, N.**, BDes(Arch) (Florida), MArch (Princeton); U Texas Austin, AIA  
**Willett, J.**, BA (Queen's), BEDS, MArch (Dal), NSAA

### **Adjunct (Retired)**

**Kroeker, R.**, BES (Manitoba), AA Dipl, ARCUK - Professor Emeritus (Dalhousie University)

## **Admission Requirements**

### **Minimum Academic Requirements**

Candidates for all graduate programs must meet the minimum admission requirements of the Faculty of Graduate Studies.

#### ***Master of Architecture***

Admission is based mainly on the applicant's design portfolio and academic record. For an applicant to be considered, a minimum of four years (eight academic terms) of university courses is required, including architectural studies equivalent to the Dalhousie BEDS degree, with a minimum B average (3.00 GPA) during the last two years (60 credit hours). A minimum B average in architectural design courses is also required. In assessing an application, the Admissions Committee looks for strong evidence of readiness to pursue graduate studies in design, humanities, technology, and professional practice. For external applicants, the committee looks for strengths equivalent to standards at the end of Dalhousie's BEDS program.

The Admissions Committee assesses transfer credits and recommends the level at which an applicant is eligible to enter the professional degree program. To meet professional accreditation standards, the committee cannot offer a level of entry that would permit a student to obtain the professional degree with less than six full years of university, including two years of general studies. An applicant who is ineligible for Master of Architecture admission may be offered entry at an advanced level in the BEDS program or may be required to take qualifying courses.

#### ***Master of Environmental Design Studies***

An applicant must have an undergraduate degree with high academic standing from a recognized university. This degree must be either a Bachelor of Environmental Design Studies degree, a Bachelor's degree with honours, or a Bachelor's degree with a major in a subject related to the applicant's proposed field of study in the MEDS program. Admission is based on the applicant's academic record and statement of intent, regarding one of the graduate positions announced on the [Graduate Programs](#) page of the School of Architecture Website. An application that does not specify an available position will not be accepted.

## **Documents**

An external applicant to one of the School's graduate degree programs must submit all of the following documents before the application can be reviewed:

### **To be submitted to the Registrar's Office:**

Admissions, Registrar's Office  
Dalhousie University  
PO Box 15000  
Halifax, NS B3H 4R2

- graduate application form
- the appropriate application fee (see [Graduate Studies Fees](#));

To confirm receipt of the items above, please contact the Registrar's Office: (902) 494-2450.

### **To be submitted to the School of Architecture:**

Graduate Admissions, School of Architecture  
Dalhousie University  
5410 Spring Garden Road  
PO Box 15000  
Halifax, NS B3H 4R2

### **MArch applicants:**

- an official academic transcript from all previous post-secondary institutions;

- evidence of competency in English for applicants whose native language is not English (see [Graduate Studies Admission Requirements](#));
- a letter describing your background, your interest in the MArch program, your proposed area(s) of specialization in the MArch program (e.g., housing, urbanization, building construction, environmental systems, history/theory, digital media), and a possible thesis topic.
- a printed portfolio of design work that demonstrates your architectural design ability. This portfolio will not be returned.
- two letters of recommendation, including at least one from an academic instructor with close personal knowledge of the applicant's academic background. Each recommendation must be submitted on a Confidential Reference Letter form.

#### **MEDS applicants:**

- graduate application form;
- an official academic transcript from all previous post-secondary institutions;
- evidence of competency in English for applicants whose native language is not English (see [Graduate Studies Admission Requirements](#));
- a letter that indicates the graduate position for which the applicant is applying (refer to the [Graduate Programs](#) page on the School of Architecture Website), summarizes the applicant's previous academic/work in this area, and describes his/her career aspirations;
- a design portfolio is optional.
- two letters of recommendation, including at least one from an academic instructor with close personal knowledge of the applicant's academic background. Each recommendation must be submitted on a Confidential Reference Letter form.

To confirm receipt of the items above, please contact the Graduate Architecture Secretary, at [grad.arch@dal.ca](mailto:grad.arch@dal.ca) or by telephone (902) 494-3973. For additional application instructions, please refer to the School of Architecture website: [dal.ca/architecture](http://dal.ca/architecture).

Dalhousie Year 4 BEDS students who apply directly to the MArch program are required to submit an application form, a design portfolio, and a statement about the proposed area of focus in the graduate program to the Architecture office by February 1. An application fee, transcripts, introductory letter, and letters of recommendation are not required.

### **Application Deadline**

For the Master of Architecture program, the deadline for applications from Canada and the United States is February 1. The deadline for applications from all other countries is December 1.

Transfer students with a pre-professional architecture degree who may not have completed courses that are equivalent to all required Dalhousie BEDS subjects should apply by October 1 and anticipate taking one or more senior undergraduate courses in the winter term.

## **Graduate Regulations**

### **School of Architecture Regulations**

In addition to the [Faculty of Graduate Studies regulations](#), refer to the 'Current Students' section of the School of Architecture Website for academic regulations.

## **Master of Architecture**

Master of Architecture is a two-year, full-time program consisting of four academic terms in residence and an eight-month work term. It includes required courses that complete the core requirements for the School's professional degree program. Elective courses also enable a student to focus on a particular area of study such as housing, urban design, history, and theory, building technology, environmental design, or computer applications. In the final year, each student works on a design thesis, supervised by a faculty member.

The MArch program begins in May. Most transfer students enter in January to take several senior undergraduate courses during the winter term before applying for MArch admission.

#### ***Year 5 - Terms M1 and M2 (Summer and Fall)***

- two core courses in Design (ARCH 50xx.06)
- two core courses in Humanities (ARCH 51xx.03)
- two core courses in Technology (ARCH 52xx.03)
- two graduate electives (ARCH 5xxx.03, ARCH 6xxx.03, or equivalent in another department)

### ***Year 5 - Terms M3 and M4 (Winter and Summer)***

- ARCH 5308.03: Professional Practice (Co-op Work Term)
- ARCH 5309.03: Professional Practice (Co-op Work Term)

Students extending their work term register for ARCH 5310.00: Co-op Work Term Continuation.

Before entering Year 6, a student must pass a Year 5 review to confirm that all Year 5 requirements have been completed.

### ***Year 6 - Term M5 (Fall)***

- ARCH 9012.12: MArch Thesis I
- one graduate elective (ARCH 5xxx.03, ARCH 6xxx.03, or equivalent in another department)

### ***Year 6 - Term M6 (Winter)***

- ARCH 5311.03: Professional Practice
- ARCH 9013.06: MArch Thesis II
- one graduate elective (ARCH 5xxx.03, ARCH 6xxx.03, or equivalent in another department)

## **Graduate Courses**

### ***Core Courses - Design***

- ARCH 5002.06: Urban Housing Studio
- ARCH 5004.06: Urban Systems Studio
- ARCH 5007.06: Landscape Studio
- ARCH 5010.06: Public Architecture Studio
- ARCH 5011.06: Coastal Studio
- ARCH 5012.06: Urban Program Studio
- ARCH 5013.06: Design-Build Studio

### ***Core Courses - Humanities***

- ARCH 5102.03: Housing Theory
- ARCH 5104.03: Urban Systems
- ARCH 5106.03: International Sustainable Development
- ARCH 5107.03: Theory and the Built Environment
- ARCH 5110.03: Architectural Exhibitions
- ARCH 5112.03: Documentation and Conservation of the Modern Movement in Architecture
- ARCH 5113.03: Technology, Culture and Society
- ARCH 5114.03: Theory of Conservation Practice
- ARCH 5115.03: Post-Colonial Culture, Architecture, and Urbanism
- ARCH 5198.03: Humanities Seminar

### ***Core Courses - Technology***

- ARCH 5210.03: Life Cycle Analysis
- ARCH 5211.03: The Construction Detail
- ARCH 5212.03: From Principle to Detail

- ARCH 5213.03: Facades
- ARCH 5214.03: Tensile Architecture
- ARCH 5215.03: Fabrication
- ARCH 5218.03: Site and Material Processes
- ARCH 5219.03: Technology of Heritage Conservation
- ARCH 5220.03: Adaptive Re-use
- ARCH 5221.03: Building Systems Design
- ARCH 5298.03: Technology Seminar

### ***Electives***

- ARCH 6002.03: Free Lab
- ARCH 6122.03: Humanities Seminar
- ARCH 6126.03: Architectural Translation
- ARCH 6209.03: Material Investigation
- ARCH 6211.03: Technology Seminar
- ARCH 6304.03: Entrepreneurship
- ARCH 6503.03: Photography in Architecture
- ARCH 6504.03: Montage in Architecture
- ARCH 6505.03: Multimedia in Architecture
- ARCH 6510.03: Architectural Documentation and Analysis
- ARCH 6511.03: Documentation of Historic Buildings
- ARCH 6513.03: Representation Seminar

For a graduate elective, a student may take a course offered by another department at Dalhousie University. The subject need not be directly related to architecture but must be at a graduate level. A maximum of two electives may be undergraduate courses in another department that have been elevated to a graduate equivalent by the instructor and approved by the Faculty of Graduate Studies. With a Letter of Permission, a student also may take a course at another university, if the course is not available at Dalhousie University.

A student can receive graduate credit for a maximum of three "special topics" courses (e.g., Humanities Seminar, Technology Seminar, Representation Seminar).

## **Master of Architecture (Post Professional)**

## **Master of Environmental Design Studies**

Master of Environmental Design Studies is a one-year, non-professional program for a student who has completed an undergraduate degree in environmental design or a related field but does not intend to become a professional architect. It may be taken through full-time or part-time study. For program availability and available subjects in 2021-2022, please refer to the Graduate [Programs](#) page on the School of Architecture Website.

Two options are available for completing the MEDS program:

1. 24 credit hours of courses plus a MEDS Major Project equivalent to 6 credit hours.
  2. 18 credit hours of courses plus a MEDS Thesis equivalent to 12 credit hours.
- ARCH 7006.06: MEDS Major Project
  - ARCH 7004.00: Continuation - MEDS Major Project
  - ARCH 9011.12: MEDS Thesis
  - ARCH 9006.00: Continuation - MEDS Thesis

Other available courses are listed in the [Master of Architecture section](#) and in the [Planning section](#) of this calendar.



# Undergraduate Degree Program

The entire professional degree program includes both the BEDS and MArch degrees. Information can be found at [School of Architecture undergraduate program](#).

## Courses Open to Non-Majors

The School of Architecture offers courses that are open to all students in the university:

- ARCH 1001.03: Introduction to Architecture 1
- ARCH 1002.03: Introduction to Architecture 2
- ARCH 1201.03: Science of the Built Environment 1
- ARCH 1202.03: Science of the Built Environment 2
- ARCH 2501.03: Design Communication 1
- ARCH 2502.03: Design Communication 2
- ARCH 3106.03: Ancient Settlements, Buildings, and Landscapes
- ARCH 3107.03: Modern Settlements, Buildings, and Landscapes

Please consult the undergraduate calendar for course descriptions.

Please consult the university's academic timetable for available courses. Individuals who are not currently registered at Dalhousie University should refer to the university's regulations in this calendar for details on Special Student status.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

### *Course Numbers*

The first digit of an ARCH course number indicates whether it is a MArch core course (5), an elective (6), MArch (Post-Prof)/MEDS course (7), or Thesis (9). The second digit indicates the area of study: Design (0), Humanities (1), Technology (2), Professional Practice (3), or Representation (5). Courses have various credit-hour extensions (03-06) that indicate the approximate class hours each week and the appropriate balance of subjects for professional accreditation.

Not all courses are offered every year. Please consult the current timetable for this year's offerings.

## Course Descriptions

### **ARCH 5002 Urban Housing Studio**

CREDIT HOURS: 6

This studio explores the aesthetic, tectonic, social/cultural, and economic challenges presented by contemporary high-density, mixed-use development. The relationships of architecture to urbanism, and building to city, will be explored through exemplary precedents and the design of housing and its associated commercial, institutional, and recreational components.

RESTRICTIONS: Graduate Students - Architecture

FORMATS: Studio

### **ARCH 5004 Urban Systems Studio**

CREDIT HOURS: 6

This studio examines the infrastructure of the metropolis and its influence on urban form and development. Topics may include systems for transportation, energy use, water distribution, civic institutions, spaces of social exchange, and ecology. Students develop urban infrastructure propositions with reference to innovative urban projects worldwide.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Studio

### **ARCH 5007 Landscape Studio**

CREDIT HOURS: 6

This studio investigates architectural responses to landscape. It regards the land as a physical and cultural context requiring appropriate methods of visualization and representation. Referring to recent projects in land art, it considers how to engage local materials and interests while promoting the sustainable occupation of a particular site.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Studio

### **ARCH 5010 Public Architecture Studio**

CREDIT HOURS: 6

This studio examines the role of public architecture in manifesting cultural values through the design of a civic institution. It also considers public architecture as an expression of material culture that mediates between the scales of artifact and landscape.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Studio

### **ARCH 5011 Coastal Studio**

CREDIT HOURS: 6

This studio investigates building on the coast. It explores conjunctions of ecology, culture, and traditional technical knowledge. Through participatory design, students work with a coastal community to develop innovative responses to situations with sensitive ecologies, extreme climate, and local cultural traditions.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Studio

### **ARCH 5012 Urban Program Studio**

CREDIT HOURS: 6

This studio focuses on a basic human need (eating, sleeping, etc.) and investigates the customs and institutions we have developed around it. Questioning local practices and considering distant references, each student formulates a program, defines a site in the city of Halifax, and designs a building with a critical and/or innovative intent.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Studio

### **ARCH 5013 Design-Build Studio**

CREDIT HOURS: 6

This field-based studio develops architectural abilities in the realization of building innovation. It emphasizes tools and processes that professionals need for detailed design development. It focuses on building prototypes of innovative structures such as wood lamella vaults, brick timber vaults, grid shells, and cable nets.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Studio

### **ARCH 5102 Housing Theory**

CREDIT HOURS: 3

This course investigates the architectural history and theory of housing as an essential human motivation, shaped by social forces. It seeks fundamental housing types from past and present, near and far, and compares their formal characteristics and social meaning. Students conduct research through case studies of modern and contemporary multiple-housing projects.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor

FORMATS: Lecture | Seminar

### **ARCH 5104 Urban Systems**

CREDIT HOURS: 3

This course examines the infrastructure of the metropolis and its influence on urban form and development. It considers transportation, energy use, water distribution, civic institutions, spaces of social exchange, and ecological systems. It emphasizes new concepts of what is "urban" and what is "natural," referring to innovative urban designs worldwide.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor

FORMATS: Lecture | Seminar

### **ARCH 5105 History and Theory of Cities**

CREDIT HOURS: 3

This course examines selected major cities, their originating form, important buildings, and building types in their history. The primary aim is to explore the relationship between architecture and urbanism and the relationship between individual buildings and the city.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor

FORMATS: Lecture | Seminar

### **ARCH 5106 International Sustainable Development**

CREDIT HOURS: 3

This course examines recent sustainable development in developed and developing countries. Local building practices and cultural appropriateness are studied within social, economic, and urban contexts. Through readings and case studies, it considers how architects, planners, and builders have handled materials and technology to engender patterns of sustainable living.

RESTRICTIONS: Graduate students – Architecture

FORMATS: Seminar

### **ARCH 5107 Theory and the Built Environment**

CREDIT HOURS: 3

This course is an overview of contemporary architectural theory, structured into three themes: architecture as a poetic act, moral act, and meaningful act. These themes allow students to develop their research and design interests in the graduate program. In a major project, students translate theoretical concerns into an architectural installation.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor

FORMATS: Lecture | Seminar

### **ARCH 5110 Architectural Exhibitions**

CREDIT HOURS: 3

This course introduces students to contemporary discussions in the field of exhibit design for architecture, including the role of the viewer, the use of display techniques to frame objects, and the curatorial voice. Groups of students develop an exhibition on a subject of their choice.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor

FORMATS: Seminar | Studio

### **ARCH 5112 Documentation and Conservation of the Modern Movement**

CREDIT HOURS: 3

This course studies the documentation and conservation of buildings, sites, and neighborhoods of the Modern Movement. It examines international charters, protocols, and issues of identifications, evaluation, and public awareness. Students undertake fieldwork and research on specific projects and contribute to a general register of modern works.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor

FORMATS: Lecture | Seminar

### **ARCH 5113 Technology, Culture, and Society**

CREDIT HOURS: 3

This course studies the technology of architecture in its broad cultural and social context. It explores the issue of technology in History, philosophy, sociology, and material culture, using contemporary and historical building as an example.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor  
FORMATS: Seminar

### **ARCH 5114 Theory of Conservation Practice**

CREDIT HOURS: 3

This course studies historical and contemporary principles of architectural conservation. It introduces philosophical questions through international charters, national policies, and practice documents. It also considers issues of heritage value and principles for making informed decisions in analyzing, documenting, and conserving historic buildings.

RESTRICTIONS: Graduate students - Architecture and Planning

FORMATS: Seminar

### **ARCH 5115 Post-Colonial Culture, Architecture, and Urbanism**

CREDIT HOURS: 3

The course investigates post-colonial culture and politics of knowledge, raising questions of social engagement and political economy in architecture and urbanism. Topics include power and control in the colonial city; orientalism and the construction of race; relations between global forces and the locale; infrastructures as contested spaces; humanitarianism and neoliberal urbanism.

RESTRICTIONS: Restricted to graduate students in the Faculty of Architecture and Planning; or permission of instructor

FORMATS: Seminar

### **ARCH 5116 Social Theory and Design**

CREDIT HOURS: 3

This seminar course surveys contemporary theories of design from a social science perspective. It focuses on the literature of Actor-Network Theory, evidence-based design, appropriate design, spatial analysis, participatory design, technological innovation, and the mapping of controversies. The student is asked to be familiar with the literature through seminar discussions and develop an argument for a particular aspect of theory.

RESTRICTIONS: Graduate students

FORMATS: Seminar

### **ARCH 5198 Humanities Seminar**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to ARCH 5199.03.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor

FORMATS: Seminar

### **ARCH 5199 Humanities Seminar**

CREDIT HOURS: 3

See ARCH 5198.03

### **ARCH 5209 Energy Efficient Design**

CREDIT HOURS: 3

This course focuses on sustainable building services. It studies building energy codes and rating systems in the Atlantic region. It also examines international strategies for low-energy building; passive systems in ventilation, heating, and cooling; renewable energy systems; and the integration of engineering systems into architectural design.

RESTRICTIONS: Graduate students – Architecture

FORMATS: Seminar

### **ARCH 5210 Life Cycle Analysis**

CREDIT HOURS: 3

This course studies the range of environmental impacts associated with building materials and assemblies, from their raw state to the end of their useful life. It considers operating energy, embodied energy, and carbon sequestration, with particular attention to the structure and building envelope of wood framed heritage buildings.

RESTRICTIONS: Graduate students - Architecture

### **ARCH 5211 The Construction Detail**

CREDIT HOURS: 3

This course examines the construction detail and its dialectical relationship to the architectural whole. Case studies of details in major twentieth-century buildings inform detail practice, in which students investigate material options and construction details for a project of their own design.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar

### **ARCH 5212 From Principle to Detail**

CREDIT HOURS: 3

This course advances the technological content of a concurrent design project or thesis. It focuses on the integration of building systems (e.g., structure, construction, environmental technology), beginning with an overview of principles, followed by a self-directed material exploration, and culminating in the production of a relevant building detail.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar | Studio

### **ARCH 5213 Facades**

CREDIT HOURS: 3

This course examines the various functions of a building facade: protection from weather, interior comfort, urban sign, and potential energy producer. It considers how a facade designed for a particular program can achieve high performance through attention to detail: building materials, manufacturing processes, and construction techniques.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar

### **ARCH 5214 Tensile Architecture**

CREDIT HOURS: 3

This course studies the design and behaviour of tensile structures by building and testing models and mock-ups. It also explores the rhetorical potential of tensile structures by integrating technologies such as video, sound, light, sensors, and smart fabrics.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Lecture | Seminar

### **ARCH 5215 Fabrication**

CREDIT HOURS: 3

This course studies the sequence of trades involved in building construction. It examines the material processes of various construction industries and considers their implications for design, with an emphasis on relations between convention and innovation.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar

### **ARCH 5217 Innovation in Computers and Building**

CREDIT HOURS: 3

This course surveys and undertakes research in computer-based architectural models and computer-assisted manufacture, logistics, and construction. After an initial survey of the state of the art, students work on a focused design or problem-solving exercise, where possible, work will contribute to actual building projects, research, competitions, and/or publication.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar | Studio

### **ARCH 5218 Site and Material Processes**

CREDIT HOURS: 3

This course includes extensive field studies in Nova Scotia and the southeast United States. It introduces principles and practices of site dynamics such as ecology, and extends student understanding of building materials, manufacture, and innovative construction processes.

RESTRICTIONS: Graduate students - Architecture  
FORMATS: Seminar | Studio

### **ARCH 5219 Technology of Heritage Conservation**

CREDIT HOURS: 3

This course studies issues of building technology in heritage conservation. Based on the Standards and Guidelines for the Heritage Conservation of Historic Places in Canada (2010), it considers building technology issues germane to different conservation interventions (preservation, restoration, and rehabilitation), the appropriate use of materials and details, and the integration of building systems technology.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar

### **ARCH 5220 Adaptive Re-use**

CREDIT HOURS: 3

Through examples and case studies, this course introduces issues of authenticity, sustainability, and relevant principles of practice as they apply to the adaptive re-use of heritage buildings. These issues are put into practice by re-designing an authentic, sustainable heritage building.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar

### **ARCH 5221 Building Systems Design**

CREDIT HOURS: 3

This course investigates the conception and orchestration of building systems. Ideas are drawn from Renaissance and nineteenth-century systematizations of architecture, from twentieth-century systems thinking, and from contemporary digital practice. Students apply these ideas to the design, construction, and analysis of projects that incorporate real, energized, building systems components.

RESTRICTIONS: Master of Architecture

FORMATS: Lab | Seminar

### **ARCH 5298 Technology Seminar**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to ARCH 5299.03.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar

### **ARCH 5299 Technology Seminar**

CREDIT HOURS: 3

See ARCH 5298.03

### **ARCH 5308 Professional Practice (Co-op Work Term)**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to ARCH 5309.03.

RESTRICTIONS: MArch students

### **ARCH 5309 Professional Practice (Co-op Work Term)**

CREDIT HOURS: 3

See ARCH 5308.03

### **ARCH 5310 Co-op Work Term Continuation**

CREDIT HOURS: 0

A student who has already registered for ARCH 5308.03 and ARCH 5309.03 may continue the co-op work term for up to three additional terms. While registered in ARCH 5310.03, a student's university status changes to part-time.

PREREQUISITES: ARCH 5308.03, ARCH 5309.03  
RESTRICTIONS: MArch students

### **ARCH 5311 Professional Practice**

CREDIT HOURS: 3

This course studies principles of professional ethics, partnerships, corporate practices, professional responsibility, and legal aspects of architectural practice. It also considers issues in practice management (contracts, reference documents, finance, costing techniques, and contract administration).

RESTRICTIONS: Graduate students - Architecture

FORMATS: Lecture | Seminar

### **ARCH 6002 Free Lab**

CREDIT HOURS: 3

This course complements normal studio-based learning. It pursues an architectural topic through experimental hands-on work in a group format. Topics change from year to year and may include design-build work, documentaries, landscape installations, community design projects, and interdisciplinary work. Projects may be local or involve travel to a distant site.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Lab

### **ARCH 6122 Humanities Seminar**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to ARCH 6123.03/ARCH 6124.03/ARCH 6125.03.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor

FORMATS: Seminar

### **ARCH 6123 Humanities Seminar**

CREDIT HOURS: 3

See ARCH 6122.03

### **ARCH 6124 Humanities Seminar**

CREDIT HOURS: 3

See ARCH 6122.03

### **ARCH 6125 Humanities Seminar**

CREDIT HOURS: 3

See ARCH 6122.03

### **ARCH 6126 Architectural Translation**

CREDIT HOURS: 3

This course studies translation: the re-creation of meaning from one cultural domain into another. Through practical projects and theoretical sources, it considers translations between architectural modes (writing, drawing, building, etc.) and between disciplines (architecture, literature, etc.). Its emphasis on lateral thinking complements linear processes in architectural research and design.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar | Studio

### **ARCH 6209 Material Investigation**

CREDIT HOURS: 3

This course uses a controlled workshop environment to examine characteristics of a material (e.g., metal, ceramic, glass) and methods for forming and finishing. Using principles of material science, it considers the harvesting or processing of raw material, the testing of structural capacity and environmental behaviour, and applications in design.

RESTRICTIONS: Graduate students - Architecture  
FORMATS: Seminar

### **ARCH 6210 Material Investigation in Wood**

CREDIT HOURS: 3

This course uses a controlled workshop environment to examine characteristics of wood and methods for forming and finishing. Using principles of material science, it considers the harvesting of raw material, the testing of structural capacity and environmental behaviour, and applications in design.

RESTRICTIONS: Graduate students - Architecture  
FORMATS: Seminar

### **ARCH 6211 Technology Seminar**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to ARCH 6212.03/ARCH 6213.03/ARCH 6214.03.

RESTRICTIONS: Graduate students - Architecture  
FORMATS: Seminar

### **ARCH 6212 Technology Seminar**

CREDIT HOURS: 3

See ARCH 6211.03

### **ARCH 6213 Technology Seminar**

CREDIT HOURS: 3

See ARCH 6211.03

### **ARCH 6214 Technology Seminar**

CREDIT HOURS: 3

See ARCH 6211.03

### **ARCH 6217 Product Development in Architecture**

CREDIT HOURS: 3

This course explores the design of manufactured building components. Through field trips, factual study, and hands-on labs, students learn the essentials of conventional and emerging production processes. They apply this knowledge to designing and prototyping a component, typically selected in support of an outside research project or a thesis.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor  
FORMATS: Seminar

### **ARCH 6304 Entrepreneurship**

CREDIT HOURS: 3

Successful entrepreneurship requires an ability to identify opportunities, skill to calculate risks, and the knowledge and determination to promote, develop, and implement a project. This course uses a case study approach to examine entrepreneurship in the public, private, and not-for-profit sectors and to assess potential applications to architectural practice.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor  
FORMATS: Seminar

### **ARCH 6503 Photography in Architecture**

CREDIT HOURS: 3

This course examines architectural photography from the late nineteenth century to the present. By analyzing and applying various photographic styles and techniques, students learn about photographic representation in architecture.

RESTRICTIONS: Graduate students - Architecture



### **ARCH 6504 Montage in Architecture**

CREDIT HOURS: 3

This course examines the history, concepts, and uses of montage in architectural representation. It also considers how digital photography and computer technology can generate various forms of montage for analyzing and developing architectural designs.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar | Studio

### **ARCH 6505 Multimedia in Architecture**

CREDIT HOURS: 3

This course examines the use of various technologies to visualize, develop, and display multimedia presentations of architecture that may include text, graphics, photographs, sound, voice, animation, and/or video. It also considers how architectural designs can be developed using multimedia. These topics may apply also to projects in urban planning.

RESTRICTIONS: Graduate students - Architecture and Planning or permission of instructor

FORMATS: Lecture | Seminar

### **ARCH 6506 Spatial Constructions in Digital Video**

CREDIT HOURS: 3

This course investigates how digital audio and video can represent physical and spatial qualities of existing architectural, urban, or rural conditions. It emphasizes the use of the video camera and digital software for recording, imaging, and editing.

PREREQUISITES: ARCH 6505.03

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar | Studio

### **ARCH 6510 Architectural Documentation and Analysis**

CREDIT HOURS: 3

This course investigates techniques for documenting and analyzing existing architectural or urban conditions. Various modes of representation (drawing, model, video, and photography) are used to interpret the complex experience of physical form.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Lecture | Seminar

### **ARCH 6511 Documentation and Reconstruction of Historic Buildings**

CREDIT HOURS: 3

This course studies the use of drawings to document existing buildings, structures, and landscapes. It also studies drawings as a means of projection and examines their role in the reconstruction of past built works and projects.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Lecture | Seminar

### **ARCH 6513 Representation Seminar**

CREDIT HOURS: 3

This course focuses on an advanced topic in architectural representation. The topic changes from year to year. It may emphasize medium, relation to design, or history and theory.

RESTRICTIONS: Graduate students - Architecture

FORMATS: Seminar | Studio

### **ARCH 7004 Continuation - MEDS Project**

CREDIT HOURS: 0

Continuation of ARCH 7006.06.

RESTRICTIONS: MEDS students

### **ARCH 7006 MEDS Major Project**

CREDIT HOURS: 6

A major project is intended to address a question of personal interest and relevance to the field of study. It may be a work of design (accompanied by a written document) or an entirely written document, guided by a supervisor and an advisor.

RESTRICTIONS: MEDS students

### **ARCH 9006 Continuation - MEDS Thesis**

CREDIT HOURS: 0

Continuation of ARCH 9011.12

RESTRICTIONS: MEDS students.

### **ARCH 9009 MArch Thesis Continuation**

CREDIT HOURS: 0

This continuation of ARCH 9013: MArch Thesis II is for students who have not completed the thesis in the minimum two terms. The maximum duration of a thesis is five terms, including ARCH 9012.

PREREQUISITES: ARCH 9008.06 or ARCH 9013.06

RESTRICTIONS: MArch students

FORMATS: Studio

### **ARCH 9011 MEDS Thesis**

CREDIT HOURS: 12

A thesis addresses a question of personal interest and relevance to the field of study. It may be a work of design (accompanied by a written document) or an entirely written document, guided by a supervisor and an advisor. The thesis document is prepared in accordance with university thesis standards.

RESTRICTIONS: MEDS students

### **ARCH 9012 MArch Thesis I**

CREDIT HOURS: 12

Within a seminar group, each student formulates an architectural hypothesis and explores it through research and creation. The student is expected to develop and demonstrate expertise in the chosen topic. This culminates in a design portfolio and a thesis outline that frames the research and defines an architectural design project for completion in MArch Thesis II. ARCH 9012.12 and ARCH 9013.06 must be completed in consecutive terms.

PREREQUISITES: Completion of Year 5 MArch

RESTRICTIONS: Restricted to MArch Students

FORMATS: Lecture | Seminar | Studio

### **ARCH 9013 MArch Thesis II**

CREDIT HOURS: 6

Each student proposes, develops, and completes an architectural design project that investigates the thesis question. The thesis concludes with a graphic/model presentation, an oral examination, and a formal thesis document that is submitted to the university. The entire thesis requires a minimum of two consecutive terms of residence.

RESTRICTIONS: Restricted to MArch Students

FORMATS: Lecture | Seminar | Studio

## **Atmospheric Science**

Location:

Sir James Dunn Building

6310 Coburg Road

Room 218

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2337  
Fax Number:  
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## Introduction

Atmospheric Science is part of the Department of Physics and Atmospheric Science and offers programs leading to MSc and PhD degrees in the following areas: cloud physics, aerosol physics and chemistry, dynamics, radiation, atmospheric chemistry, planetary remote sounding from space and the ground, Arctic atmospheres, LIDAR systems and climate modeling.

The Department of Physics and Atmospheric Science also offers programs leading to a [Diploma in Meteorology](#). For more details see the undergraduate calendar.

## Graduate Degrees

Graduate degrees in Atmospheric Science may be taken through the Departments of Physics and Atmospheric Science or Oceanography. Please see the calendar entry for [Physics and Atmospheric Science](#) or [Oceanography](#) for more details.

## Staff

### Chairperson of Department

Rotermund, H. H., (902) 494-2342

### Graduate Coordinator

Monchesky, T., (902) 494-3582, [theodore.monchesky@dal.ca](mailto:theodore.monchesky@dal.ca)

### Coordinator, Atmospheric Science

Martin, R., (902) 494-3915

### Professors

Drummond, J. R., MA, D. Phil (Oxford), FRSC-Canada Research Chair, Remote Sounding of Atmospheres

Geldart, D. J. W., BSc (Acadia), PhD (McMaster) FRSC - Research

Martin, R. V., BS (Cornell), MS, MSc (Oxford), PhD (Harvard)

### Assistant Professors

Chang, R. Y. W., BAsC, MASc, PhD (Toronto)

Lesins, G. B., PhD (Toronto)

### Associate Professors

Duck, T., BSc, PhD (York)

Folkins, I., BSc (Dalhousie), MSc, PhD (Toronto)

### Adjunct (FGS)

Pierce, J., BS (Northeastern), PhD (Carnegie Mellon)

Ritchie, H. C., PhD (McGill), MSC

### Postdoctoral Fellows/Research Associates

Croft, B., PhD (Dalhousie)

Geddes, J., PhD (Toronto)

Snider, G., PhD (McGill)

Tikhomirov, A., D Sci (Institute of Atmospheric Optics, St. Petersburg)

Tsehtik, Y., MSc (Mozhaisky Military Space Engineering Univ)

van Donkelaar, PhD (Dalhousie)

## Biochemistry and Molecular Biology

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## Staff

### Head of Department

**Bearne, S. L.**, BSc (Acadia), PhD (Toronto), MDCM (McGill)

### Graduate Coordinator

**Karten, B.**, MSc (Hamburg), PhD (Graz)

### Associate Graduate Coordinator

**Kramer, J.M.**, BSc (Guelph), PhD (Memorial)

### Professors Emeriti

**Doolittle, W. F.**, AB (Harvard), PhD (Stanford)

**Gray, M. W.**, BSc, PhD (Alberta)

### Professors

**Archibald, J. M.**, BSc, PhD (Dalhousie), Director, Centre for Comparative Genomics & Evolutionary Bioinformatics.

**Bearne, S. L.**, BSc (Acadia), PhD (Toronto), MDCM (McGill), cross appointment in Chemistry

**Blouin, C.**, BSc (Laval), PhD (Dalhousie), joint appointment with Computer Science, Assoc. Dean (Academic), Faculty of Computer Science

**Dellaire, G.**, BSc (UBC), PhD (McGill), major appointment in Pathology

**Doolittle, W. F.**, AB (Harvard), PhD (Stanford), post-retirement

**Duncan, R.**, BSc (Guelph), MSc (Queen's), PhD (Guelph), major appointment in Microbiology and Immunology

**Gray, M. W.**, BSc, PhD (Alberta), post-retirement

**Karten, B.**, MSc (Hamburg), PhD (Graz)

**Liu, P. X. -Q.**, BSc (Wuhan), PhD (Cornell)

**Marignani, P. A.**, BSc (Windsor), MSc (Western Ontario), PhD (McMaster), EMBA (UWO), cross appointment in Pathology

**McLeod, R. S.**, BSc, PhD (UBC), Assoc. Dean (Research), Faculty of Medicine

**McMaster, C. R.**, BSc, PhD (Manitoba), FCAHS, major appointment in Pharmacology

**Rainey, J. K.**, BSc (Guelph), MSc, PhD (Toronto), cross appointment in Chemistry; Director Nuclear Magnetic Resource NMR-3)

**Ridgway, N. D.**, BSc, MSc (Dalhousie), PhD (UBC), joint appointment with Pediatrics

**Ro, H. -S.**, BSc, PhD (McMaster)

**Roger, A. J.**, BSc (UBC), PhD (Dalhousie)

**Rosen, K. V.**, BSc, MSc, PhD (Moscow State), joint appointment with Pediatrics

**Too, C. K. L.**, BSc, MSc (Malaya), PhD (Hawaii)

**Waisman, D. M.**, BSc (Brandon), PhD (Manitoba), joint appointment with Pathology

### Associate Professors

**Frampton, J.P.**, BSc (Albany), PhD (Michigan), major appointment in the School of Biomedical Engineering

**Kienesberger, P. C.**, MSc, PhD (Graz)

**Kramer, J.M.**, BSc (Guelph), PhD (Memorial)

**Pulinilkunnil, T.**, MSc (NIPER, India), PhD (UBC)

**Slamovits, C.**, PhD (Buenos Aires)

### Assistant Professors

**Langelaan, D.N.**, BSc (Acadia), PhD (Dalhousie)

**Van der Spoel, A. C.**, MSc (Utrecht), PhD (Rotterdam), major appointment in Pediatrics

### **Senior Instructor**

**Ewart, K. V.**, BSc (Moncton), PhD (Memorial)

### **Adjunct**

**Cohen, A.**, BSc (Buenos Aires), PhD (Memorial)

## **Admission Requirements**

General requirements for admission to the Faculty of Graduate Studies are given in the [Faculty Regulations](#) section. The Department accepts applicants with honours degrees (or the equivalent) in biochemistry and molecular biology and also those with research-based training in related fields such as biology, chemistry, and biomedical sciences. The Department also requires a Research Statement (1-2 pages maximum) detailing past research experience and research interests for graduate study; a CV or resume is also requested for a full assessment of academic acceptability. A TOEFL score of at least 600 (paper-based) or 100 (internet), or an IELTS score of at least 7.5 is necessary for those whose native language is not English. The TOEFL requirement may be waived if completion of the degree is at an institution where the language of instruction is English.

## **Master of Science (MSc) Degree Program**

Program requirements comprise participation in BIOC 5914 and BIOC 5915 in Year 1; six additional credit hours of graduate coursework; attendance at Departmental seminars; a Departmental seminar presentation in Year 2; one Term of service as a Teaching Assistant; biannual supervisory committee meetings; and, the preparation, presentation and oral defence of a thesis describing original research done by the candidate. A Graduate Supervisory Committee consisting of the research supervisor and two others is appointed to facilitate the research. The minimum residence requirement for the MSc program is usually one year (see the [Faculty of Graduate Studies regulations](#)). Most students take an additional 12-18 months to complete the thesis.

## **Doctor of Philosophy (PhD) Degree Program**

Program requirements comprise: participation in BIOC 5914 and BIOC 5915 in Year 1 (unless waived by Graduate Coordinator); additional graduate coursework at the discretion of supervisor and Graduate Coordinator; attendance at Departmental seminars; Departmental seminar presentations every two years, starting in Year 2; a Grant Proposal in Year 3; two Terms of service as a Teaching Assistant; biannual supervisory committee meetings; and, as the major requirement, the preparation, presentation and oral defence of a thesis describing an extensive original investigation carried out by the candidate. A Thesis Supervisory Committee consisting of the research supervisor and three others is appointed to facilitate the research. For students admitted directly into the PhD program, and for those requesting transfer from the MSc to the PhD program, the Comprehensive Examination around the subject area of the thesis is required, usually in the second year of study. Typically, this follows completion of required coursework; however, exceptions may be made in order to ensure a timely Comprehensive Examination. The minimum residence requirements for the PhD are two years from the MSc and three years from the BSc (see the [Faculty of Graduate Studies regulations](#)). Most students take an additional three years to complete the thesis.

## **Areas of Specialization**

### **Molecular Cell Biology and Molecular Genetics**

Dellaire, G. - Nuclear structure and cancer biology; chemotherapy resistance and cancer biomarkers; CRISPR genome engineering; the role of nuclear organization in DNA repair, tumour suppression, and cell cycle control; genome instability and pre-mRNA splicing; zebrafish as a novel animal tumour model.

Duncan, R. - Protein-mediated cell-cell membrane fusion during viral infections and muscle cell differentiation; viral fusion protein structure and function; cellular pathways involved in cell-cell fusion; exosomes and nonenveloped virus transmission; oncolytic viruses for tumor therapy.

Kramer, J.M. - Epigenetics and Chromatin in Neurodevelopmental Disorders, *Drosophila* neurobiology, Learning and Memory, Gene Regulation.

McMaster, C. R. - Lipid homeostasis: genetic and molecular analysis of lipid metabolism in yeast with an eye to human disease genes; protein structure and function.

Marignani, P. A. - Molecular signaling of tumour suppressors, protein kinases and cellular migration, stem cell biology, genome stability, model organisms, translational research, system biology.

Ro, H. -S. - Signaling mechanisms of chronic inflammation/macrophage activation in atherogenesis, mammary tumorigenesis, and type 2 diabetes mellitus.

Rosen, K. V. - Mechanisms of three-dimensional tumor growth: molecular control of cancer cell survival in the absence of adhesion to the extracellular matrix.

Too, C. K. L. - Prolactin and steroid hormone action: signal transduction; gene expression; regulation of tumor cell growth and apoptosis; breast and prostate cancers.

van der Spoel, A. C. - Biochemistry of Parkinson's disease: (1) Alpha-synuclein-sphingolipid interactions in a cellular environment; (2) Discriminating the activities of the sphingolipid-degrading enzymes glucocerebrosidase and beta-glucosidase 2."

Waisman, D. M. - Molecular mechanisms of metastasis and angiogenesis. Role of inflammation in tumor progression.

## **Comparative Genomics, Proteomics and Molecular Evolution**

Archibald, J. M. - Genome evolution, gene transfer, endosymbiosis, molecular phylogeny.

Blouin, C. - Protein evolution and folding, molecular phylogeny, bioinformatics.

Cohen, A.M. - Proteomics and metabolomics analyses of biological samples using combined chromatography and tandem mass spectrometry techniques.

Doolittle, W. F. - Genome evolution: genomics, molecular phylogeny, role of lateral gene transfer in phylogeny and evolutionary innovation, origin and evolution of genomic complexity.

Gray, M. W. - Protist genomics: evolution of protist mitochondrial and nuclear genomes; ribosomal RNA, RNA processing and RNA editing.

Liu, P. X. -Q. - Intein-catalyzed protein splicing and applications in recombinant protein engineering, site-specific modification, peptide cyclization, and artificial spider silks.

Roger, A. J. - Protistan phylogenetics, organelle evolution and evolutionary genomic analysis: protein evolution; anaerobic organelles and bioinformatic method development.

Slamovits, C. H. - Eukaryotic genome structure and evolution, diversity, and evolution of molecular mechanisms in eukaryotes, molecular biology and evolution of microbial parasites.

## **Structure, Function and Metabolism of Biomolecules**

Bearne, S. L. - Enzyme catalysis and protein engineering: transition state analogues; enzyme inhibition; bio-organic reaction mechanisms; organic synthesis; biochemical recognition; protein modifications; active site architecture; enzyme evolution; proteomics.

Ewart, K. V. - Protein folding adaptations in cold marine environments and relevance to amyloid diseases; chemical chaperones; sustainable marine resource development.

Frampton, J.P. - Structure and function of biomaterials formed from colloids, polymer fibers and hydrogels. Bioengineered *in vitro* models for studying cell-cell and cell-matrix interactions.

Karten, B. - Cholesterol metabolism in the brain: Cholesterol trafficking and import into mitochondria in relation to energy metabolism in neurons and glia. Role of cholesterol in synaptic function, Niemann-Pick Type C disease.

Kienesberger, P. C. - Role of lipid metabolism and signalling in energy metabolism, obesity, and cardiovascular disease. Nutrient signalling and control of mitochondrial function.

Langelaan, D. N. – Investigating protein structure and function: high-resolution structural characterization of proteins; protein-protein interactions; protein self-assembly; protein expression and purification; biophysical and functional assays.

Pulinilkunnil, T. - Metabolic regulation of Autophagy in health and disease; Nutrient regulation of lysosome function; Biology of amino acid metabolism and signaling; Role of alpha-mannosyltransferase in glycosylation disorders

Rainey, J. K. - Structural biology: studying membrane and fibre-forming proteins and peptides; peptide synthesis and expression of challenging proteins; biophysical characterization using protein NMR spectroscopy, scanning probe microscopy and complementary techniques.

Ridgway, N. D. - Synthesis and transport of lipids between organelles: Assembly of lipid droplets; cholesterol and phospholipid transport proteins; nuclear lipid synthesis and regulation.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **BIOC 5001 Special Topics in Biochemistry & Molecular Biology**

CREDIT HOURS: 3

Students interested in topics not covered in formal classes may ask the department for special classes to meet their needs. The fields in which the department can offer instruction are reflected in the list of faculty research areas.

### **BIOC 5010 Bioinformatics**

CREDIT HOURS: 3

This course presents the theory and practice of bioinformatics. Topics include rates of mutations, sequence alignment, database searching, phylogenetic analysis, bioinformatic tools for analyzing gene, genomes and proteins.

EXCLUSIONS: BIOC 4010.03

FORMATS: Lecture | Lab

### **BIOC 5305 Mechanisms of Signal Transduction**

CREDIT HOURS: 3

The goal of this course is to introduce key concepts of signal transduction. Topics include regulation of cell signalling by receptors and protein kinases, lipids in signalling, cell metabolism, apoptosis, autophagy, cell cycle and cell signalling in disease.

EXCLUSIONS: BIOC 4305

### **BIOC 5307 Current Topics in Molecular and Cell Biology of Lipids**

CREDIT HOURS: 3

Explores mechanisms and regulation of lipid metabolism, trafficking, and cell signaling. Includes sections on lipids in the central nervous system, methods of lipid analysis, and lipids in disease. Emphasis is given to the evaluation of original data and critical reading of current literature. Evaluation is based on seminar presentations, an essay, and short home assignments.

PREREQUISITES: Instructor's consent.

FORMATS: Seminar | Discussion

### **BIOC 5308 Molecular Mechanisms of Complex Diseases**

CREDIT HOURS: 3

The objective of this seminar course is to familiarize students with the molecular mechanisms that are involved in human diseases. The course will emphasize Metabolic Syndrome which is comprised of cancer, diabetes and cardiovascular diseases and clinical applications of molecular signalling. Specific areas that are covered in detail include the role of tumor suppressors, oncogenes, cell metabolism and epigenetic events that give rise to disease. The use of animal models to study the complex interplay between environment and molecular homeostasis will also be discussed.

### **BIOC 5309 Advances in Cardiovascular Biochemistry**

CREDIT HOURS: 3

Using primary literature, this course covers biochemical mechanisms underlying cardiac physiology and pathology. Topics include myocyte action potential biochemistry; cardiac conducting systems; sarcolemmal calcium signaling; cytoskeletal assembly; endothelium-cardiomyocyte crosstalk; metabolite utilization; mitochondrial energy metabolism; pathological signaling pathways and their remodeling; and, biochemistry of congenital heart disease.

FORMATS: Lecture

### **BIOC 5403 Genes and Genomes**

CREDIT HOURS: 3

This course discusses the organization of genes into genomes. It deals with (i) genetic material in nuclear and organellar genomes, (ii) components of genomes that are not genes, (iii) methodology of genomics and proteomics, and (iv) genetic organization and higher order chromosomal structure and function.

EXCLUSIONS: BIOC 4403.03

FORMATS: Lecture

### **BIOC 5404 Gene Expression**

CREDIT HOURS: 3

This course is centered around the central dogma that genetic information is passed from DNA to RNA to protein. We focus on the different mechanisms that regulate this flow of information in prokaryotic and eukaryotic cells. Specific topics include transcription, translation, chromatin, epigenetics, and non-coding RNA.

EXCLUSIONS: BIOC 4404.03

FORMATS: Lecture

### **BIOC 5501 Medical Biotechnology**

CREDIT HOURS: 3

This course covers the fundamental principles of biotechnology from a medical perspective. Topics covered include recombinant DNA technology, DNA sequencing, DNA microarray, antibody, and polymerase-chain reaction-based applications, production of transgenic organisms, potential applications for embryonic stem cell and nuclear transfer cloning, business and legal aspects of biotechnology.

EXCLUSIONS: BIOC 4501.03

FORMATS: Lecture | Discussion

### **BIOC 5503 Pathobiology of Cancer**

CREDIT HOURS: 3

This course will examine the basic molecular and cellular biology of carcinogenesis and tumor pathobiology, as well as emerging topics in cancer genomics, diagnosis, and treatment. The clinical aspects of cancer management will also be highlighted, including surgery, radiation, and chemotherapy.

CROSSLISTED: PATH 5040.03, MICI 5040.03

FORMATS: Lecture | Discussion



### **BIOC 5700 Proteins**

CREDIT HOURS: 3

Our theme is the relationship between structure and function. The kinetic and thermodynamic determination of the protein fold is explored. Specific details of how form determines function in binding other molecules both small and large, in membranes, and in energy transduction are provided. Protein evolution and turnover are examined.

EXCLUSIONS: BIOC 4700.03

FORMATS: Lecture

### **BIOC 5701 Enzymes**

CREDIT HOURS: 3

Fundamental principles of enzyme catalysis and its regulation are examined. Topics include enzyme kinetics, enzyme inhibition and inactivation, isotope effect measurements, site-directed mutagenesis, and the active site architecture and transition state stabilization of selected enzymes. Classic and current papers in the literature are reviewed and the experimental and conceptual approaches are critically appraised.

EXCLUSIONS: BIOC 4701

FORMATS: Lecture | Seminar

### **BIOC 5702 Biophysical Characterization of Macromolecules**

CREDIT HOURS: 3

This course covers methods allowing determination of sub-molecular and atomic-level structure and dynamics of biomacromolecules in physiological settings (e.g., solution-state or lipid bilayers) including fluorescence, electronic and vibrational circular dichroism and NMR spectroscopy; light vs. X-ray vs. neutron scattering; and single molecule methods.

CROSSLISTED: CHEM 5602.03

EXCLUSIONS: BIOC 4702.03, CHEM 4602.03

FORMATS: Lecture

### **BIOC 5703 Structural Biology**

CREDIT HOURS: 3

This course covers theoretical and practical aspects of determining and assessing the quality of atomic-resolution biomolecular structures. The underlying theory and applications of X-ray diffraction, NMR spectroscopy, and cryo-electron microscopy are discussed in detail.

CROSSLISTED: CHEM 5603.03

EXCLUSIONS: BIOC 4703.03, CHEM 4603.03

FORMATS: Lecture | Lab | Tutorial

### **BIOC 5813 Biochemistry of Clinical Disorders**

CREDIT HOURS: 3

This course is an introduction to the pathophysiology of disease. It provides the clinical and biochemical background to disease groups and system disorders and the laboratory approach to their diagnosis. Topics include cardiovascular, renal, gastrointestinal, and hepatobiliary disorders, in addition to acid base, carbohydrate, lipid and amino acid disorders; endocrine and rheumatological diseases, as well as tumor markers and toxicology, blood and immune abnormalities.

CROSSLISTED: PATH 5013.03

EXCLUSIONS: PATH 5011.03 and PATH 5012.03, BIOC 4813.03

FORMATS: Lecture | Discussion

### **BIOC 5910 Biochemistry and Molecular Biology Seminar**

CREDIT HOURS: 6

This course provides students with experience in the written and oral presentation of scientific data. Interactive faculty and peer feedback is used to hone students' skills with an emphasis on both clarity of presentation and on the ability of students to discuss specialist topics in general terms.

FORMATS: Seminar

### **BIOC 5914 Scientific Communication in Biochemistry and Molecular Biology I**

CREDIT HOURS: 3

This course provides students with experience in the written and oral presentation of scientific data. Interactive faculty and peer feedback is used to hone student skills with an emphasis on both clarity of presentation and on the ability of students to discuss specialist topics in general terms.

EXCLUSIONS: BIOC 5910.06

FORMATS: Tutorial | Seminar

### **BIOC 5915 Scientific Communication in Biochemistry and Molecular Biology II**

CREDIT HOURS: 3

This course provides students with experience in oral presentation of scientific data and in organization of a scientific symposium. Interactive faculty and peer feedback is used to hone student skills with an emphasis on both clarity of presentation and on the ability of students to discuss specialist topics in general terms.

EXCLUSIONS: BIOC 5910.06

FORMATS: Seminar | Other (explain in comments)

### **BIOC 6701 Mechanistic Enzymology**

CREDIT HOURS: 1.5

Enzymes from a variety of classes will be examined from an organic chemistry reaction mechanism perspective. The general principles of enzyme catalysis and the experimental approaches used to elucidate enzyme reaction mechanisms will be discussed. Applications and examples from the current literature will be critically appraised.

PREREQUISITES: Instructor's consent

CROSSLISTED: CHEM 6458.015

FORMATS: Lecture

### **BIOC 6702 Topics in High Resolution Nuclear Magnetic Resonance**

CREDIT HOURS: 1.5

Advanced topics in high resolution liquid state nuclear magnetic resonance will be explored, including the quantum mechanical basis of the observables, product operator treatment of pulse sequences, 2D NMR pulse sequences, coherence selection and relaxation.

PREREQUISITES: Instructor's permission.

EXCLUSIONS: CHEM 6362.015

FORMATS: Lecture

### **BIOC 6703 Magnetic Resonance Techniques for Drug Design and Development**

CREDIT HOURS: 1.5

Magnetic resonance techniques such as NMR spectroscopy and magnetic resonance imaging (MRI) have become essential tools for the design and molecular characterization of drugs and therapeutics. Topics of current interest are covered and include structural characterization of drugs, receptors and binding motifs, and MRI techniques for drug monitoring.

PREREQUISITES: Instructor's permission

CROSSLISTED: CHEM 6457.015

FORMATS: Seminar | Discussion

### **BIOC 9000 MSc Thesis**

CREDIT HOURS: 0

### **BIOC 9530 PhD Thesis**

CREDIT HOURS: 0

## **Bioethics**

Location:

Clinical Research Centre

5849 University Avenue

Room C-315

PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3801  
Fax Number: (902) 494-3865  
Email Address:  
Website: [www.bioethics.dal.ca](http://www.bioethics.dal.ca)

## Staff

### Department Head

**Simpson, C.**, BA&Sc, MA (McMaster), PhD (Dalhousie)

### Professors

**Fernandez, C.**, Hon BSc (UWO), MD (McMaster), FRCPC. Professor and Head of pediatric hematology/oncology, Department of Pediatrics at the IWK Health Centre and Dalhousie University with a cross-appointment in the Department of Bioethics. Interests: pediatric research ethics including return of research results to research participants, Wilms tumor, and principal investigator Children's Oncology Groups.

**Kirby, J.**, MA, MD (Dalhousie). Interests: ethics analysis of complex healthcare practices, ethics dimensions of medical assistance in dying, social justice and accountability in healthcare policy and practice, critical care ethics, use of deliberative engagement methodologies to enhance collaborative decision-making, organ donation and transplantation ethics, social accountability in medical education.

### Associate Professors

**Capps, B.**, BSc (Cardiff Univ, UK), MA (Univ Sheffield, UK), PhD (Univ Bristol, UK). Interests: The ethics of One Health, public health, and infectious diseases; stem cell science and ethics, neuroethics; and jurisprudential and political theory.

**Reid, L.**, BA (Winnipeg), AM, PhD (Illinois). Interests: normative questions in universal health coverage; preferential access (ethical wait list management, ethical advocacy, "queue-jumping", professional courtesy); business ethics for physician practice groups; moral development and professional identity formation in medical education; philosophical issue in definition of health and disease, including definition and determination of death.

**Simpson, C.**, BA&Sc, MA (McMaster), PhD (Dalhousie). Interests: the role of hope in health care, ethics education and capacity building, rural health care ethics and organizational ethics.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

NOTE: The courses listed are half year courses and may not be offered every year. Instructors are likely to vary from year to year. Consult the department for further information.

## Course Descriptions

### BIOT 5000 Advanced Topics in Bioethics

CREDIT HOURS: 3

The seminar involves critical examination of the bioethics literature. The application of various methodologies utilized in contemporary bioethical analysis will be highlighted. It will be of interest to graduate students in medicine, health professions, health law, and philosophy whose thesis topic involves a substantial bioethical component.

PREREQUISITES: Instructor Permission

FORMATS: Seminar

### **BIOT 5001 Research Ethics**

CREDIT HOURS: 3

This seminar involves critical examination of the research ethics literature, with particular attention to a range of topics including: informed consent; research involving specific groups/communities; risks/limits to allowable risks; emergency room research; and placebo controls. It will be of interest to graduate students in medicine, health professions, health law, and philosophy.

PREREQUISITES: Permission of the instructor

FORMATS: Seminar

### **BIOT 5002 Health Care Ethics and the Law**

CREDIT HOURS: 3

The purpose of this course is to develop an understanding of health law and healthcare ethics and of the relationship between law and ethics. Topics covered in the past years include informed choice; death and dying; genetics; reproduction; HIV and AIDS; resource allocation; and health research. Each issue is examined in an effort to determine what the law is and what the law ought to be.

CROSSLISTED: LAW 2115.03

### **BIOT 5101 Directed Readings in Bioethics I**

CREDIT HOURS: 3

This is an advanced level directed reading course designed for graduate students. Instructors and topics can vary.

PREREQUISITES: Permission of the instructor

### **BIOT 5102 Directed Readings in Bioethics II**

CREDIT HOURS: 3

This is an advanced level directed reading course designed for graduate students. Instructors and topics can vary.

PREREQUISITES: Permission of the instructor.

### **BIOT 5801 Topics in Health Care Ethics**

CREDIT HOURS: 3

In this course, we will explore some of the current debates among different theoretical perspectives about the proper theoretical groundwork for bioethics and the methodologies associated with these diverse theories. We shall pay particular attention to canonical work in the field, such as the principles approach of Beauchamp and Childress, while examining feminist and other alternatives. We shall consider the ways different theories identify, frame, and reason about ethical questions that arise in the realm of health and healthcare.

CROSSLISTED: PHIL 5801.03

FORMATS: Seminar

## **Biology**

Location:

Life Sciences Centre  
1355 Oxford Street

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3515

Fax Number: (902) 494-3736

Email Address: [biology@dal.ca](mailto:biology@dal.ca)

Website: [biology.dal.ca](http://biology.dal.ca)

# Staff

## Chair

Bentzen, P.

## Graduate Coordinator

Stone, S.

## Graduate Admissions

Ruzzante, D.

## Professors Emeriti

**McLaren, I. A.**, MSc (McGill), PhD (Yale), George S. Campbell Professor Emeritus. Copepod growth rules; population biology; copepods; birds; seals

**O'Dor, R. K.**, PhD (UBC)

## Professors

**Adamo, S.**, BSc (Toronto), PhD (McGill), major appointment in Psychology. Insect and cephalopod behavioural physiology

**Bentzen, P.**, MSc (UBC), PhD (McGill), Killam Professor, Fisheries Resource Conservation Genetics and Biotechnology. Population genetics, conservation genetics, evolutionary genetics, fish ecology, fisheries science

**Budge, S.**, PhD (Memorial)

**Burton, D. L.**, BSc (Dalhousie), MSc (Guelph), PhD (Alberta), major appointment in Plant, Food, and Environmental Sciences (Agr)

**Caldwell, C. D.**, BSc (Mt. A), MSc (Dalhousie), PhD (East Anglia), major appointment in Plant, Food, and Environmental Sciences (Agr)

**Croll, R.**, PhD (McGill), major appointment in Physiology/Biophysics. Molluscan neurobiology, development, and reproduction

**El Hiani, Y.**, BSc (Zohr), MSc (France), PhD (France)

**Ewart, K. V.**, PhD (Memorial), Major appointment in Biochemistry & Molecular Biology

**Fredeen, A.**, BSA (Saskatoon), MSc (Guelph), PhD (California), major appointment in Animal Science and Aquaculture

**Gujar, S.**, DVM, MHA, PhD

**Gunawardena, A.**, BSc (Peradeniya, Sri Lanka), PhD (Oxford Brookes). Programmed cell death, plant development, plant cell biology

**Hutchings, J.**, MSc, PhD (Memorial), Killam Chair. Evolutionary ecology of fishes, life history evolution, salmonid fish, population biology, commercially exploited fishes, reproductive strategies, marine conservation biology

**Iverson, S. J.**, PhD (Maryland), WFA. Reproductive strategies in mammals, lactation and energetics lipid metabolism, fatty acids, diets in marine mammals

**Johnston, M. O.**, PhD (Chic), Campbell Chair. Evolutionary genetics, plant evolution, plant ecology, mutations and evolution, molecular evolution, plant reproduction, evolution of self-fertilization, inbreeding depression, speciation, floral development, sex allocation in hermaphroditic animals

**Lada, R.**, BSc, MSc (Hort) (TNAU), PhD (Adelaide), major appointment in Plant, Food, and Environmental Sciences (Agr)

**Lane, P. A.**, MSc (SUNY Binghamton), PhD (SUNY Albany). Environment-economy interaction, environmental management, sustainability in Cuba and Latin America, freshwater and marine ecosystems, food web analysis

**Leonard, M. L.**, PhD (Ottawa). Behavioural ecology, parent-offspring interactions, conservation, avian communication, and conservation

**Lotze, H. K.**, BSc (Gottingen), MSc, PhD (Kiel). Marine resources, population and community ecology, human impacts, cumulative effects, ecosystem structure and functioning, biodiversity, ecological history, management, and conservation

**Meinertzhagen, I. A.**, DSc, PhD (St. Andrews), University Research Professor, major appointment in Psychology. Visual system in flies, *Drosophila*, synapse formation, computer 3-D construction techniques, circadian rhythms, cell lineage, neurons in ascidian tadpole larva, evolution of all of these

**Metaxas, A.**, BSc (McGill), MSc (UBC), PhD (Dalhousie), major appointment in Oceanography

**Nams, V. O.**, BSc (Toronto), MSc (Alberta), PhD (Victoria), major appointment in Environmental Sciences (Agr)

**Percival, D. C.**, BSc (Agr), MSc, PhD (Guelph), major appointment in Environmental Sciences (Agr)

**Prithviraj, B.**, BSc (Agr) (Annamalai), MSc, PhD (BHU)

**Ruzzante, D. E.**, PhD (Dalhousie), Killam Professor. Professor and CRC in Marine Conservation Genetics. Population and conservation genetics of aquatic organisms. Adaptive radiation in fish

**Simpson, A. G. B.**, BSc, PhD (Sydney Australia). Early Eukaryote Evolution: biodiversity and systematics of eukaryotic microbes (protists; protozoa), sub-cellular morphology of protists, molecular phylogenetics, genome evolution, classification

**Stone, S. L.**, PhD (York). Plant development, molecular biology, ubiquitination, regulated proteolysis, hormone signaling, stress tolerance

**Walde, S. J.**, PhD (Calgary). Stream ecology, predator-prey interactions, arthropod populations, dispersal, competition

**Wang-Pruski, G.**, BSc (China), PhD (Alberta), major appointment in Plant and Animal Science (Agr)

**Whitehead, H.**, MA, PhD (Cambridge). Behaviour, ecology, population biology of whales, social structure in vertebrates

**Worm, B.**, PhD (Kiel). Marine biodiversity science, biodiversity-ecosystem linkages, marine conservation ecology, experimental community ecology of rocky shores, fisheries ecology, human impacts on marine ecosystems

### **Associate Professors**

**Bielawski, J. P.**, PhD (Texas A & M Univ). Adaptive molecular evolution, adaptation, and diversification in prokaryotes, molecular phylogenetics, genomics, bioinformatics

**Crossin, G. T.**, BA (Maine), BSc (New Hampshire), MSc, PhD (UBC). Physiological mechanisms underlying phenotypic variation in life-history traits. Endocrine costs of reproduction and carryover effects in migratory animals. Avian and fish model systems. Animal telemetry

**Cutler, C.**, BSc Hons (Memorial), MPM (SFU), PhD (Guelph) major appointment in Plant, Food and Environmental Sciences (Agr)

**Herbinger, C. M.**, PhD (Dalhousie). Population, conservation and quantitative genetics of aquatic organisms, aquaculture

**Latta, R.**, MSc (Toronto), PhD (Colorado). Ecology and Evolution of Plants. Spatial genetic structure of populations, migration and gene flow, adaptation to local environments, natural selection

**Lynch, D. H.**, BSc, MSc (Agr) (McGill), PhD (Guelph), major appointment in Plant, Food and Environmental Sciences (Agr)

**Rupasinghe, H. P. V.**, BSc (Peredeniya), MSc (Iowa), PhD (Guelph), major appointment in Plant, Food and Environmental Sciences (Agr)

### **Assistant Professors**

**Bertrand, E.**, BSc (Bates College), PhD (MIT/WHOI), Microbial Oceanography, Proteomics, Phytoplankton

**Côté, P. D.**, BSc (Ottawa), PhD (McGill). Cellular neurobiology, molecular genetics, neural development, retina maturation, synaptogenesis, sodium channels

**McLean, N. L.**, BSc (Agri), MSc (McGill), PhD (Dalhousie), major appointment in Plant, Food and Environmental Sciences (Agr)

**Myles, S. A.**, BA (St. Thomas), MSc (Oxford), PhD (Max Planck), major appointment in Plant, Food and Environmental Sciences (Agr)

### **Adjunct (FGS)**

**Baillie, S.**, MSc (Memorial), PhD (Massey)

**Benoit, H.**, BSc (Calgary), MSc (Memorial), PhD (Dalhousie)

**Bowen, W. D.**, PhD (UBC), B.I.O.

**Bradbury, I. R.**, BSc, BEd, MSc (Memorial), PhD (Dalhousie)

**Cameron, R.**, BScF (New Brunswick), MSc (Acadia)

**Dalziel, A.**, BSc (Acadia), MSc (Queens), PhD (UBC)

**Davidson, J.**, PhD (Tromsø)

**Devillers, R.**, BSc (Université Lyon), MSc (Quebec), PhD (Laval), PDF (Natural Resource Canada)

**Ells, T.**, BSc (Acadia), MSc (Acadia), PhD (Dalhousie)

**Franz-Odentaa, T.**, BSc (Hons), MSc, PhD (Cape Town)

**Guderley, H.**, BA (Indiana), PhD (UBC)

**Hardie, D.**, BSc (Guelph), MSc (Guelph), PhD (Dalhousie)

**Harvey-Clark, C.**, BSc (Victoria), PhD (Saskatoon), LAM (Alberta)

**Hipfner, M.**, BSc (Guelph), MSc (Ottawa), PhD (Memorial)

**Horn, A.**, BSc (Cornell), PhD (Toronto)

**Kieth, D.**, DEng (Cape Breton), BEng (Dalhousie), BSc (Calgary), MSc (Calgary), PhD (Dalhousie)

**Kuparinen, A.**, MSc, PhD (Helsinki)

**Lacroix, C.**, BSc (McGill), MSc (McGill), PhD (Guelph), PDF (McGill)

**Litvak, M.**, BSc (York), MSc, PhD (Toronto)

**Lee, R. W.**, MA (Mass), PhD (SUNY Stony Brook)

**Love, O.**, BSc (Concordia), MSc (McGill), PhD (SFU)

**Lundholm, J.**, BSc (Queens), MSc (York), PhD (Guelph)

**Mallory, M.**, BSc (Queens), MSc (Carleton), PhD (Carleton)

**Moors-Murphy, H.**, BSc (UNB), MSc (UNB), PhD (Dalhousie)

**Qaderi, M. M.**, MSc, PhD (Western)

**Ronconi, R. A.**, BSc (Alberta), PhD (Victoria)

**Ross, N.**, BSc, PhD (McGill)

**Shackell, N. L.**, BSc (McGill), PhD (Dalhousie)

**Stokesbury, M. J. W.**, BA (Acadia), BSc (UNB), MSc (Acadia), PhD (Dalhousie)

**Trudel, M.**, BSc (Montreal), MSc (Montreal), PhD (McGill)

Weir, L., BSc (Concordia), MSc (Dalhousie), PhD (Dalhousie)  
Whoriskey, F. G., PhD (Laval)

## Admission

The Biology Department has facilities for advanced study and research leading to the MSc and PhD degrees.

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies and normally a student will not be permitted to earn all three degrees (BSc, MSc, and PhD) at Dalhousie. All inquiries for admission to the graduate program should be addressed to Carolyn Young, Biology Department.

## Master of Science (MSc) Degree Program

Students are required to take at least 12 credit hours at the graduate level including BIOL 5702.015 and 5704.015: Communication Skills and BIOL 5710.03 or 5720.03 or 5730.03: Graduate Module Classes; they may include graduate courses from other departments or the Faculty of Agriculture. Additional courses may be specified by supervisory committees.

Students are required to demonstrate in an undergraduate biology course for at least one year and must take an admission to candidacy examination during the first nine months.

A thesis reporting original research must be submitted and defended orally.

Students are expected to participate in weekly departmental seminars.

## Doctor of Philosophy (PhD) Degree Program

Students without MSc degrees have the same course requirement as MSc students. Students with MSc degrees must take at least six credit hours at the graduate level including BIOL 5702.015 and BIOL 5704.015: Communication Skills (unless taken previously). Additional courses may be taken. Students are required to demonstrate in an undergraduate biology course for one year and must take an admission to candidacy exam in their first nine months.

A preliminary examination including a review paper and thesis progress report is required for all PhD students. Students must pass the preliminary examination at least one year before submitting a PhD thesis.

A thesis reporting original research must be defended orally. Students are expected to participate in weekly departmental seminars.

### *Ancillary and Audit Courses*

At the discretion of the Supervisory Committee, Supervisor or ATC examiners, a student may be directed to take for credit courses needed to make up deficiencies or acquire skills considered beneficial but of subsidiary importance. If these are undergraduate level courses they are designated as ancillary, to be passed with a minimum grade of D. They must be reported to the Graduate Coordinator or Stream Chair at the interview in September. They may **not** be used for **graduate credit**.

Students may also elect or be required to audit courses relevant to their program. No credits are received for these. A maximum of one audit course is allowed for each year of the specified program (e.g., One for a 1-year MSc, two for a 2-year MSc, etc.). Continuing Students may not audit. However, additional courses may always be audited if paid for with extra fees.

### *Course Selection*

Courses with the extension .03 are three credit hours. All others (sometimes shown with the extension .06) are six credit hours.

Some courses are offered only in alternate years. Others are suspended due to sabbatical leaves but will resume when the staff return. All course offerings are included in this listing so that students may plan their entire course of study in their first year. Such planning is necessary because the Faculty of Graduate Studies requires that a complete program be prepared for each student by October 15th in their first year.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Additional Courses Information

### Required Courses for MSc Students

BIOL 5700.03: Communication Skills

BIOL 5705.03/BIOL 5706.03: Graduate Module Classes

### Special Topics Courses

BIOL 5800-BIOL 5899: Special Topics and Projects in Biology

A suitable combination of directed reading, seminars, written assignments, individual study and discussion or laboratory projects in a prescribed area. Courses are organized and scheduled by appropriate faculty, Adjunct Professors or honorary Research Associates when requested by interested students. Students should approach potential instructors directly with their requests. Each separate topic must be approved by the Graduate Coordinator and approval is not normally given for students taking a course from their research supervisor. A course description is required before approval can be given. Courses may be worth three or six credit hours, depending upon duration and content.

BIOL 5801.03: Special Topic in Agricultural Biology  
BIOL 5802.03: Special Topic in Animal Behaviour  
BIOL 5803.03: Special Topic in Animal Physiology  
BIOL 5804.03: Special Topic in Animal Science  
BIOL 5805.03: Special Topic in Aquaculture  
BIOL 5806.03: Special Topic in Biochemistry  
BIOL 5807.03: Special Topic in Biological Education  
BIOL 5808.03: Special Topic in Biomathematics  
BIOL 5809.03: Special Topic in Biostatistics  
BIOL 5810.03: Special Topic in Cell Biology  
BIOL 5811.03: Special Topics in Development Biology  
BIOL 5812.03: Special Topic in Ecology  
BIOL 5813.03: Special Topic in Environmental Biology  
BIOL 5814.03: Special Topic in Evolutionary Biology  
BIOL 5815.03: Special Topic in Fish Biology  
BIOL 5816.03: Special Topic in Functional Morphology  
BIOL 5817.03: Special Topic in Genetics  
BIOL 5818.03: Special Topic in History of Biology  
BIOL 5819.03: Special Topic in Industrial Microbiology  
BIOL 5820.03: Special Topic in Limnology  
BIOL 5821.03: Special Topic in Marine Biology  
BIOL 5822.03: Special Topic in Marine Ecology  
BIOL 5823.03: Special Topic in Marine Microbiology  
BIOL 5824.03: Special Topic in Microbiology  
BIOL 5825.03/BIOL 5925.06: Special Topic in Molecular Biology  
BIOL 5826.03: Special Topic in Philosophy of Biology  
BIOL 5827.03: Special Topic in Phycology  
BIOL 5828.03: Special Topic in Plant Biology  
BIOL 5829.03: Special Topic in Plant Ecology  
BIOL 5830.03: Special Topic in Plant Physiology  
BIOL 5831.03: Special Topic in Plant Science  
BIOL 5832.03: Special Topic in Population Biology  
BIOL 5833.03: Special Topic in Zoology



## Course Descriptions

### **BIOL 5033 Molecular Genetic Techniques in Ecology**

CREDIT HOURS: 3

Students gain experience in techniques of molecular ecology that include but may extend beyond DNA isolation, electrophoresis, PCR, RFLP and microsatellite analysis. Techniques are learned in the context of an actual research project. Evaluation is based on class participation, the student's laboratory note-book, and a report on research carried out.

### **BIOL 5042 Marine Conservation Genetics**

CREDIT HOURS: 3

We survey techniques of molecular genetic analysis and consider how they can be used to identify species, populations, sexes, individuals and family relationships, and study population attributes such as historical dispersal, contemporary connectivity, mating behaviour and effective population size. Evaluation is based on assignments, an essay and two exams.

PREREQUISITES: BIOL 2060.03, BIOL 2030.03 or BIOA 3001.03, GENE 2000.03

FORMATS: Lecture | Discussion

### **BIOL 5044 Genetics in Ecology**

CREDIT HOURS: 3

The interface between heritable variation among living things (genetics) and their interactions with their environment (ecology) is the fundamental crucible of adaptive evolutionary change. This course will present an advanced examination of genetic variation in ecologically important traits. Both single gene and continuously varying (quantitative) traits will be examined.

PREREQUISITES: BIOL 3041.03 and STAT 2080.03

CROSSLISTED: BIOL 4044.03

FORMATS: Lecture | Seminar

### **BIOL 5050 Advanced Topics in Developmental Biology**

CREDIT HOURS: 3

This course examines the molecular-genetic basis of development using model organisms, e.g., *Drosophila* and *Arabidopsis*, and the use of current techniques to identify key genes controlling development and explores how genes, proteins and cells interact in development of animals and plants.

PREREQUISITES: BIOL 3050.03 or equivalent

FORMATS: Lecture | Seminar | Discussion

### **BIOL 5060 Environmental Ecology**

CREDIT HOURS: 3

The ecological effects of pollution, disturbance, and other stressors, both anthropogenic and natural. Major subject areas are air pollutants, toxic metals, acidification, eutrophication, oil spills, pesticides, forestry, warfare, urban ecology, risks to biodiversity, and resource degradation. The overarching context of the course is ecological sustainability of the human economy.

PREREQUISITES: None

CROSSLISTED: BIOL 3060.03

### **BIOL 5061 Experimental Design in Biology**

CREDIT HOURS: 3

This course introduces students with previous training in univariate statistics to the practice and pitfalls of experimental design and data analysis in biology. Lectures and take-home exams are used to demonstrate the fundamentals of design and analysis, with emphasis on potential problems and how they are overcome.

CROSSLISTED: BIOL 4061.03

FORMATS: Lecture

**BIOL 5062 Analysis of Biological Data**

CREDIT HOURS: 3

The course introduces students to techniques available for the analysis of biological data, including regression, general linear models, and multivariate methods. Emphasis is on the practical use of these techniques rather than derivations. Students analyze real and realistic data sets and are assessed on write-ups of these analyses.

CROSSLISTED: BIOL4062.03

FORMATS: Lecture

**BIOL 5067 Ecology and Evolution of Fishes**

CREDIT HOURS: 3

This course will examine selected topics on the ecology and evolution of marine and freshwater fishes. Topics shall include systematics, morphology, evolutionary ecology, behaviour, life history strategies, population biology, and fisheries management.

PREREQUISITES: BIOL 2001.03, BIOL 2060.03 or BIOA 3001.03

FORMATS: Lecture

**BIOL 5070 Advanced Topics in Animal Physiology**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to BIOL 5080.03.

PREREQUISITES: Classes in organic chemistry, general biochemistry, physiology, and plant biology normally necessary. Permission of instructor required

CROSSLISTED: BIOL 4070.03

FORMATS: Lecture | Lab

**BIOL 5080 Advanced Topics in Animal Physiology**

CREDIT HOURS: 3

See BIOL 5070.03

**BIOL 5103 Infectious Diseases of Aquatic Organisms**

CREDIT HOURS: 3

This course will examine a variety of pathogens (viral, bacterial, fungal, and protozoan) with emphasis on disease prevalence, diagnosis, control and pathogen identification. Immune systems of invertebrates and vertebrates will be discussed in relation to disease.

CROSSLISTED: BIOL 4012.03

FORMATS: Lecture

**BIOL 5105 Medical Biotechnology I**

CREDIT HOURS: 3

See course description for BIOC 4501.03/5501.03 and PHAR 4351.03 in the Biochemistry or Pharmacology sections of this calendar.

PREREQUISITES: Consent of instructor

CROSSLISTED: BIOC 4501.03

FORMATS: Lecture | Discussion

**BIOL 5214 Physiology and Biochemistry of Marine Algae**

CREDIT HOURS: 3

Algae are examined in terms of their major processes and products with attention directed toward the influence of environmental factors, such as light, nutrition and temperature. The taxonomic classes are compared by means of pigment composition, nitrogenous compounds, reserve products and cell wall structure.

FORMATS: Lecture

**BIOL 5220 Plant Cell Biology**

CREDIT HOURS: 3

This course covers the structure, function, and dynamic properties of plant cellular components including constituent organelles, cytoskeleton, and the cell wall. Areas of significant current research such as programmed cell death, cell signaling, and cellular trafficking are considered in depth. The course consists

of lectures, student seminars and report writing.

PREREQUISITES: BIOL 2020.03 (or BIOA 2001.03) and BIOL 2004.03 or permission of the instructor

CROSSLISTED: BIOL 4220.03

FORMATS: Lecture | Seminar

### **BIOL 5302 Clinical and Molecular Immunology**

CREDIT HOURS: 3

MICI 5302

CROSSLISTED: MICI 5302

### **BIOL 5501 The Evolution of Life Histories**

CREDIT HOURS: 3

A life history describes how reproductive effort changes with age to create strategies that influence survival and reproduction. Life-history research is fundamental to population ecology, evolutionary biology, sustainable harvesting, and conservation biology. Life-history theory provides an explanatory/predictive framework for understanding why organisms differ in how they propagate genes to future generations.

EXCLUSIONS: BIOL 4500

FORMATS: Lecture

### **BIOL 5510 Cultural Evolution**

CREDIT HOURS: 3

Culture is socially learned and group specific information or behaviour. This course explores the nature of culture across the animal kingdom, how it evolves, as well as its relationship to ecology, genetic evolution, and conservation.

EXCLUSIONS: BIOL 4510.03

### **BIOL 5602 Introduction to Aquaculture**

CREDIT HOURS: 3

This course offers a lecture-based introductory overview of aquaculture; the culturing and rearing of aquatic plants and animals. Lectures will deal with the following topics: (1) general overview of aquaculture; (2) physical and chemical properties of the aquatic environment; (3) site selection; (4) aquatic engineering; (5) aquaculture modeling; (6) finfish culture; (7) bivalve culture; (8) crustacean culture; (9) seaweed culture; (10) health and pathology; (11) growth and nutrition; (12) genetics and reproduction; (13) legal, economic, social, and environmental considerations; (14) sustainability issues. These topics will be covered with both a Maritimes and a global perspective. This course is designed to familiarize students with the multi-disciplinary nature of aquaculture as a field. The introduction will describe the state of aquaculture production in the world. The main body of the course is divided in three sections covering the aquatic milieu, species specific culture techniques, and general biological principles. The amount of interplay between various physical, biological, and species-specific aspects will be shown in each topic. We will overview legal, economic, and social considerations and we will look at some of the controversies surrounding aquaculture environmental sustainability. This is an introductory class, and most topics will not be covered in fine detail. However, I expect student to get a clear appreciation of the underlying principles of aquaculture and how these come into play in chosen examples of aquaculture practices.

EXCLUSIONS: MARI 3602

FORMATS: Lecture

### **BIOL 5610 Scientific Writing and Advanced Laboratory in Biochemical Techniques**

CREDIT HOURS: 6

This course will consist of a series of laboratory modules (3 modules each of 4 weeks' duration, 1 day per week or 72 hours in total with limited flexibility to accommodate the need to attend other courses) and tutorials with computer-based assignments designed to teach scientific writing techniques (9 hours in total). The course is organized collaboratively by the Departments of Biochemistry & Molecular Biology, Biology, and Microbiology & Immunology. Several lab modules will be offered in 3 sections covering techniques used in the study of molecular biology, protein structure-function, and specific metabolic processes. Students in concentrated Honours Biochemistry must complete 1 module from each section. Students in combined Honours with Biochemistry may select their three modules from any section or sections, subject to availability of space. Students must obtain a course outline from the Biochemistry & Molecular Biology Department office prior to registration and return the module selection form at least 24 hours prior to the organizational meeting, the date of which will be indicated in the Registration Timetable.

CALENDAR NOTES: Credit can only be given for this course if completed in consecutive terms, partial credit cannot be given for a single term. Students are expected to register in this course each term, receiving a grade of IP until all course requirements are completed.

CROSSLISTED: BIOC 5610.06, MICI 5610.06

EXCLUSIONS: BIOC 4610.06, BIOL 4013.06, MICI 4610.06

FORMATS: Lab | Tutorial

### **BIOL 5651 Evolutionary Ecology of Marine Mammals**

CREDIT HOURS: 3

We explore evolution in the context of the marine environment. The marine mammals form a particularly clear and interesting group for this objective, as mammals evolved on land and then the marine mammals adapted to a highly distinct marine environment. Students will learn generally of these adaptations to the marine environment and explore particular areas of biology as their assignments.

EXCLUSIONS: MARI 4090.03

FORMATS: Lecture

### **BIOL 5660 Ecosystem Modelling for Aquaculture**

CREDIT HOURS: 3

Learn a collection of tools for the sustainable utilization of aquatic resources. Emphasis is on bilateral interactions between aquaculture and the environment. topics include water/sediment/biota variability, carrying capacity, invasive species, habitat destruction/creation, ecosystem functions/services, climate change, etc. Tools include data analysis/modelling/visualization/mapping using Python (prior programming experience is not required).

CROSSLISTED: MARI 4600.03

FORMATS: Lecture

### **BIOL 5665 Hacking the blue planet: the scientific and social dimensions of ocean fertilization**

CREDIT HOURS: 3

This course explores the biology, ecology, biogeochemistry, and ethical and legal dimensions of purposeful ocean fertilization. Through lectures, discussion, case studies, and group projects, students consider the biological and oceanographic basis of ocean fertilization and its use as a 1) scientific tool and 2) controversial geoengineering strategy for climate change mitigation.

PREREQUISITES: Instructor's permission

CROSSLISTED: OCEA 5665

EXCLUSIONS: OCEA 4665 and MARI 4665

FORMATS: Lecture | Discussion

### **BIOL 5700 Communication Skills**

CREDIT HOURS: 3

Through realistic, practical assignments students test and develop their communication skills. There is also information on the graduate program in Biology and other aspects of the work of a biologist (e.g., ethics). Students must register in BIOL 5700 in both the fall and winter terms. Successful progress will result in a grade of "IP" in the Fall, with a final grade assigned in the winter term.

CALENDAR NOTES: Required of all students.

CROSSLISTED: BIOL 5702.015 and BIOL 5704.015

FORMATS: Lecture | Seminar | Discussion

### **BIOL 5710 Graduate Module Class I**

CREDIT HOURS: 3

All M.Sc. students must complete three (3) modules, typically one to two months in duration each, selected from the list of available modules provided on the module website (~15-20). All students choose from the same set of modules. Where module completion typically occurs over two terms, all students are expected to register in BIOL 5710 in both the fall and winter terms. Successful progress will result in a grade of "IP" in the Fall, with a final mark assigned in the winter term for Module Class I when all 3 of the selected modules have been completed. Students choosing to complete additional modules for course credit may do so through enrollment in BIOL 5720 or BIOL 5730 following completion of BIOL 5710.

### **BIOL 5720 Graduate Module Class II**

CREDIT HOURS: 3

This course provides students the option of gaining additional course credit for completion of modules beyond the requirements of BIOL 5710. Students must complete three (3) modules, typically one to two months in duration each, selected from the list of available modules provided on the module website (~15-20) that have not previously been taken. All students choose from the same set of modules. Where module completion typically occurs over two terms, all students are expected to register in BIOL 5720 in both the fall and winter terms. Successful progress will result in a grade of "IP" in the Fall, with a final mark assigned in the winter term for Module Class II when the second set of 3 modules have been completed.

PREREQUISITES: BIOL 5710.03

FORMATS: Other (explain in comments)

**BIOL 5730 Graduate Module Class III**

CREDIT HOURS: 3

This course provides students the option of gaining additional course credit for completion of modules beyond the requirements of BIOL 5710 and 5720. Students must complete three (3) modules, typically one to two months in duration each, selected from the list of available modules provided on the module website (~15 -20) that have not previously been taken. All students choose from the same set of modules. Where module completion typically occurs over two terms, all students are expected to register in BIOL 5730 in both the fall and winter terms. Successful progress will result in a grade of "IP" in the Fall, with a final mark assigned in the winter term for Module Class III when the third set of 3 modules have been completed.

FORMATS: Other (explain in comments)

**BIOL 5800 Special Topics and Projects in Biology**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to courses BIOL 5801.03 through to BIOL 5899.03.

**BIOL 5802 Special Topic in Animal Behaviour**

CREDIT HOURS: 3

**BIOL 5803 Special Topic in Animal Physiology**

CREDIT HOURS: 3

See BIOL 5800

**BIOL 5805 Special Topic: Aquaculture**

CREDIT HOURS: 3

See BIOL 5800.03

**BIOL 5806 Special Topic in Biochemistry**

CREDIT HOURS: 3

See BIOL 5800.03

**BIOL 5808 Special Topic in Biomathematics**

CREDIT HOURS: 3

See BIOL 5800.03

**BIOL 5809 Special Topic in Biostatistics**

CREDIT HOURS: 3

See BIOL 5800.03

**BIOL 5810 Special Topic in Cell Biology**

CREDIT HOURS: 3

See BIOL 5800.03

**BIOL 5811 Special Topics in Development Biology**

CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5814 Special Topic in Evolutionary Biology**  
CREDIT HOURS: 3  
See BIOL 5800.03.

**BIOL 5815 Special Topic in Fish Biology**  
CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5817 Special Topic in Genetics**  
CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5818 Special Topic in History of Biology**  
CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5820 Special Topic in Limnology**  
CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5823 Special Topic in Marine Microbiology**  
CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5824 Special Topic in Microbiology**  
CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5825 Special Topic in Molecular Biology**  
CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5826 Special Topic in Philosophy of Biology**  
CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5827 Special Topic in Phycology**  
CREDIT HOURS: 3  
See BIOL 5800.03

**BIOL 5828 Special Topic in Plant Biology**

CREDIT HOURS: 3

See BIOL 5800.03

**BIOL 5830 Special Topic in Plant Physiology**

CREDIT HOURS: 3

See BIOL 5800.03

**BIOL 5832 Special Topic in Population Biology**

CREDIT HOURS: 3

See BIOL 5800.03

**BIOL 9000 MSc Thesis**

CREDIT HOURS: 0

**BIOL 9530 PhD Thesis**

CREDIT HOURS: 0

## Biomedical Engineering

Location:

Dentistry Building  
5981 University Avenue  
Room 5197  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3427

Fax Number: (902) 494-6621

Email Address: [BME@Dal.ca](mailto:BME@Dal.ca)Website: [bme.medicine.dal.ca](http://bme.medicine.dal.ca)

## Introduction

The School of Biomedical Engineering is a collaborative effort of the Faculty of Medicine and the Faculty of Engineering.

The interdisciplinary research within the School of Biomedical Engineering at Dalhousie University is concentrated in four thrust areas: (i) Biomaterials and Tissue Engineering, (ii) Imaging and Medical Technology, (iii) Biosignals and Physiological Modelling, (iv) Dynamics of Human Motion. Other significant research efforts in biomedical engineering at Dalhousie include work in kinesiology and gait including orthopaedic implants, biomechanics in cardiac, orthopaedic, respiratory, and cellular systems, auditory and vestibular function, ultrasound, microfluidics and 3D cellular constructs, biomedical instrumentation and robotics.

The program offers both a Master of Applied Science (MAsc) degree and a Doctor of Philosophy (PhD) degree in Biomedical Engineering.

The program also offers BioMedic: An NSERC CREATE training program in Biomedical Technology, Innovation, and Commercialization. The training program includes courses in partnership with Dalhousie's Business School on the Business of Medical Technology and Technological Needs in the Clinical Settings, and work placements at local and international medical device companies. Upon successful completion of the Training program a certificate in competency will be noted on the student's academic record in addition to the degree completed. See department website for details.

# Staff

## Director

**Maksym, G. N.**

## Graduate Coordinator

**Brown, J.**

## Professors

**Beyea, S. D.**, PhD (UNB). Nuclear magnetic resonance imaging physics. Technique development for high field functional neuroimaging. NMR studies of degradable biomaterials and implantable devices. Primary appointment at the Institute for Biodiagnostics (Atlantic) - National Research Council Canada

**Dunbar, M.**, MD (Dalhousie), PhD (Lund). Joint biomechanics and kinematics. Development of radio stereometric analysis and gait Analysis for Prediction of hip and knee arthroplasty failure. Development of gait laboratory surrogates for clinical assessment of orthopaedic patients. Primary appointment in Surgery, Division of Orthopedics

**Filiaggi, M.**, PhD (Toronto). Biomaterials and biomedical devices for orthopaedic, dental, and cardiovascular applications; therapeutic delivery. Primary appointment in Applied Oral Sciences

**Fine, A.**, VetMD, PhD (Univ of Pennsylvania). Synaptic function and plasticity in the brain. . Brain networks underlying sensation and memory. Advanced optical methods for imaging neural structure and function. Primary appointment in Physiology and Biophysics

**French, A.**, PhD (Essex). Information encoding and processing by sensory neurons, mechanotransduction, nonlinear systems analysis and ion channel biophysics. Primary appointment in Physiology and Biophysics

**Gu, J.**, PhD (Alberta). Medical robotic devices and applications; artificial eye implant control; rehabilitation assistive device design and applications; sensor fusion in mobile robot. Primary appointment in Electrical and Computer Engineering

**Kozey, C.**, PhD (Dalhousie). Classification of neuromuscular control patterns associated with normal movement and movement in the presence of pathology and/pain. These studies involve the use of electromyography, and other sensors to measure muscle function and motion parameters. Primary appointment in the School of Physiotherapy

**Kreplak, L.**, PhD (Paris). My research goal is to unveil the design rules underlying the unique mechanical properties of protein assemblies, cells, and tissues. I am interested in both bottom-up and top-down approaches. In the former, I study the relationship between structure and mechanical properties for peptides and proteins assemblies in vitro. In the latter, I am interested in human pathologies that modify the mechanical properties of cells and tissues through changes in cytoskeletal or extra-cellular matrix architecture. Primary appointment in Physics and Atmospheric Science

**Lee, J. M.**, PhD (Western). Bioprosthetic heart valves and vascular grafts, intravascular stents, biopolymers, tissue mechanics, developmental changes in cardiovascular system. Primary appointment in Applied Oral Sciences

**Maksym, G.**, PhD (McGill). Modelling and signal analysis applied to respiratory cellular biology and physiology with technology development of respiratory medical devices and research tools for the clinic and for investigation of the biomechanics of the cells, tissues, and whole lung in respiratory health and disease. Primary appointment in School of Biomedical Engineering

**Price, R. B.**, DDS (Dalhousie), PhD (Malmo, Sweden). Photopolymerization of dental resins, hardness testing, cytotoxicity of dental resins, light emitting diode (LED) dental curing lights, optical testing of dental curing lights, mechanical testing of dental materials. Primary Appointment in Dentistry

**Rainey, J.K.**, BSc (Guelph), MSc, PhD (Toronto) Protein and polymer-based fibrous and nanoparticle biomaterials design, development, testing, and application; NMR and optical spectroscopy; structural biology. Primary appointment in Department of Biochemistry & Molecular Biology

**Wilson, J. L.**, PhD (Dalhousie). Modeling and description of joint dynamics, neuromuscular function, and orthopedic biomechanics, with particular application to the study of knee osteoarthritis gait patterns and other musculoskeletal disorders. Pattern recognition and statistical modeling of complex biomechanical data. Three-dimensional motion capture analysis, electromyography, Radiostereometric Analysis, and computer-assisted surgery. Primary appointment in Biomedical Engineering

**Zhang, P.**, BSc, MSc (Jilin U, China), PhD (Western). Material science, nanoscience and technology, synchrotron spectroscopy, biotechnological applications of nanocrystals. Primary appointment in School of Biomedical Engineering

## Associate Professors

**Adamson, R.**, PhD (Toronto). My research concerns the biomechanics of hearing and new diagnostic imaging technologies for otology. My primary focus is on developing optical probes for investigating the ear - an optical coherence tomography (OCT) probe for imaging and a fiber optic hydrophone for dynamic pressure measurement. Primary appointment in School of Biomedical Engineering

**Boyd, D.**, PhD (Limerick). Glass based biomaterials for minimally invasive clinical interventions; synthesis, characterization, and safety and efficacy evaluation of new clinical materials (Oncology, Spine and Dentistry). Primary appointment in Applied Oral Sciences



**Brewer, K.**, PhD (Dalhousie). Molecular imaging with focus on the use of magnetic resonance imaging (MRI) and positron emission tomography (PET). Projects use imaging to improve understanding and clinical translation of novel immunotherapies in cancer. Primary appointment in Diagnostic Radiology

**Brown, J. A.**, PhD (Queen's). High-resolution ultrasound imaging, micro-transducer design and fabrication, miniaturized piezoelectric hearing prosthesis. Primary appointment in Biomedical Engineering

**Frampton, J. P.**, PhD (State Univ of New York at Albany). Microscale cell and tissue engineering, cell-material interactions, liquid handling technologies, microfluidic manipulation of cells, design, and development of multiplex bioassays. Primary appointment in School of Biomedical Engineering

**Gratzer, P.**, PhD (Toronto). Tissue engineering. Developing scaffolds for tissue regeneration (e.g., blood vessels, ligaments) using naturally derived materials (collagen and elastin). Primary appointment in School of Biomedical Engineering

**Horne, G.**, MD (London), PhD (Calgary). Septal mechanics in heart failure. Non-invasive functional myocardial imaging (echocardiography, MRI, scintigraphy), somatic cell gene therapy for myocardial repair. Primary appointment in Medicine

**Milne, A. D.**, BEng (TUNS), MSc (UWO), MD (Dalhousie), FRCPC (Anesthesia), PEng. Research ranges from basic laboratory testing to clinical outcome studies. Specific areas of interest include: Anesthesia Airway Equipment Design, Device Testing and Quality Control, Clinical Anesthesia Database/Outcome Studies, and Drug Stability. In addition to Anesthesia related work, I also have interests in Orthopedics/Plastic Surgery; specifically, Biomechanics/Biomaterials, 3-D kinematics, and surface geometry digitization. Graduate students are welcome to shadow me in the operating room to get a better understanding of biomedical device implementation and real-world usage. Primary appointment in Department of Anesthesiology

**Quinn, T. A.**, PhD (Columbia University, NY). Cardiovascular disease, with an emphasis on changes in cardiac mechanics, electrophysiology, and mechano-electric interactions leading to cardiac arrhythmias and heart failure; Cardiac regulation, with an emphasis on intrinsic autoregulatory mechanisms, including stretch and the intracardiac nervous system; Fluorescence-, optogenetic-, and computational modelling-based structure-function studies using whole animals to isolated cells. Primary appointment in the Department of Physiology and Biophysics

**Rutherford, D. J.**, BScPT (Toronto), PhD (Dalhousie). Joint biomechanics and electromyography associated with dynamic walking challenges in lower extremity injury and disease with implications for biomechanical intervention development and evaluation. Lead researcher in the Joint Action Research Laboratory, Dalhousie University. Primary appointment in School of Physiotherapy. Affiliated Scientist with Nova Scotia Health Authority Central Zone

**Wells, S. M.**, PhD (Toronto). Structural-mechanical relations in biopolymers such as elastin and collagen are examined in order to determine the underlying mechanism(s) of elasticity of these materials-and thereby to understand the functioning of the arteries, ligaments, skin etc. which they make up. As well, research examines the structural remodeling of these structures during development and maturation: from fetal to adult life. Primary appointment in School of Biomedical Engineering

### Assistant Professors

**Leung, B.**, PhD (Toronto). Tissue engineering and microfabricated cell culture platforms. Development of 3d microtissue and acini models for epithelial disease modeling as well as advanced co-culture techniques to study microbe-mammalian cells interactions. Primary appointment in Department of Applied Oral Sciences, Faculty of Dentistry

### Adjunct (FGS)

**Veres, S.P.**, BEng(Dalhousie), PhD (Auckland). Structure-function relationships in biomaterials. My research focuses on the identification, implications, and exploitation of structural changes that occur within biomaterials (primarily collagen) in response to mechanical loading. A multi-level approach is employed, studying tissues at the macro, micro, ultrastructure, and molecular levels. Pathologies of interest currently include rupture and sub-rupture of tendons and ligaments, and spinal damage including intervertebral disc herniation, and internal disc disruption. Primary appointment in the Division of Engineering, Saint Mary's University

### Adjunct (Retired)

**Stanish, W. D.**, MD (Dalhousie), FRCS (Canada). BST-cargel: in situ chondroinduction for cartilage repair. Gait patterns in individuals suffering with moderate osteoarthritis of the knee, but with non-surgical interventions. Psychological predictors of prolonged pain and disability following total knee arthroplasty. Primary appointment in Division of Orthopaedic Surgery, Faculty of Surgery, Dalhousie University

## Master of Applied Science (MAsc) Program

### Admissions

Candidates must satisfy the general requirements for admission in the Faculty of Graduate Studies. In addition to the Faculty of Graduate Studies requirements, the School of Biomedical Engineering has the following requirements for the MAsc program.

Students will be accepted into the MASc program from:

1. BEng or BASc from an accredited undergraduate engineering program
2. Four-year BSc in the physical sciences (e.g., Mathematics, Physics, Chemistry, etc.) with research experience\*\*
3. Four-year BSc in the biological sciences (e.g., Physiology, Biophysics, Biochemistry, Microbiology, Immunology, etc.) with research experience\*\*
4. MD, DVM, DDS, or equivalent

In cases (3) and (4) above, additional undergraduate coursework may be required prior to entry into the program. This will depend on the nature of the research thesis to be undertaken and the requirements will be developed in consultation with the school; however, a minimum of second year undergraduate calculus (equivalent to Dalhousie University's MATH 2001.03: Intermediate Calculus I and MATH 2002.03: Intermediate Calculus II) plus linear algebra and/or statistics, and one year of physics and chemistry will normally be required. Please contact the department for details. \*\*Qualifications for research experience include: a research thesis, senior research project, or equivalent work experience determined in consultation with the School of Biomedical Engineering.

A minimum mid-B average during the student's undergraduate coursework (with a minimum average of A- over the last two years) will be required, plus demonstrated ability to communicate and write in English (100 TOEFL iBT, or IELTS 7.5 or Dalhousie College of Continuing Education A)(consistent with the entry requirements of the Faculty of Graduate Studies, e.g., TOEFL>600).

## Degree Requirements

1. At least a total of 18 credit hours to be chosen in consultation with a school advisor. It is expected that a minimum of 12 credit hours will be taken from the suite of 5000 level courses offered by the School of Biomedical Engineering. In addition, students whose preparation in a particular area is deficient may be required to complete appropriate courses, as part of the 18 credit hours, or exceeding this number.
2. Attendance and participation in the BME seminar program, and the annual BME Research Day.
3. A research thesis representing original work by the student will be carried out under the supervision (or co-supervision) of a faculty member of the School of Biomedical Engineering who is also a member of the Faculty of Graduate Studies. This thesis will normally be 75-100 pages in length exclusive of figures, tables, references, etc. Where the student's principal research supervisor is not appointed in the School of BME, a co-supervisor from within the school will be named on the advice of the school's Graduate Studies Coordinator in order to ensure that the thesis contains sufficient Biomedical Engineering content. The student must also undertake a satisfactory oral defense of the research thesis.

## Doctor of Philosophy (PhD) Program

Candidates must satisfy the general requirements for admission in the Faculty of Graduate Studies. In addition to the Faculty of Graduate Studies requirements, the School of Biomedical Engineering has the following requirements for the PhD program.

Students will be accepted into the PhD program from a Masters degree from an accredited program. Transfer from the MASc program will only be considered for exceptional students who have completed at least 15 credit hours and passed a PhD Transfer Examination.

### Degree Requirements

1. Normally 12 credit hours.
2. Attendance and participation in the SBME Seminar Program, and annual Research Day.
3. Successful completion of a PhD Candidacy Examination.
4. Successful completion and examination of a PhD research thesis.
5. Presentation of research work at one or more national or international conferences.
6. Submission or publication of at least one research paper in a refereed journal.

### Financial Support

Students accepted into the MASc or PhD program in the School of Biomedical Engineering will be offered a stipend to support their graduate studies. Minimum stipends are consistent with Faculty of Medicine and university levels and can come from external or Dalhousie scholarships or through financial support from the supervisor's research funding. Major sources for scholarships include external awards from NSERC (PhD recipients also receive President's Award from Dalhousie which covers tuition costs), CIHR, Nova Scotia Health Research Foundation, Nova Scotia Graduate Scholarships, and internal awards including the Dalhousie Killam

Scholarship, Faculty of Graduate Studies scholarships, and Faculty of Engineering scholarships. In order to be considered for scholarship support, applications should be made by April 1 for a September start.

## Supervisory Committees

Each student in an MASc or PhD program in the School of Biomedical Engineering will have a supervisory committee consisting of their thesis supervisor or co-supervisors plus a minimum of two faculty members appointed to the Faculty of Graduate Studies, one of whom must be a member of the School of Biomedical Engineering, and another with a primary appointment in another department. The supervisory committee should be formed within four months of initial registration. The supervisory committee will meet at least twice per year (including an initial meeting immediately following the formation of the committee), or when called by any member of the committee or the student.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **BMNG 5010 Introductory Physiology for Biomedical Engineering**

CREDIT HOURS: 3

A survey of the physiology of human organ systems including the nervous, cardiovascular, respiratory, renal, gastrointestinal, and endocrine systems. Some emphasis will be placed on engineering principles, including biomechanics, bioelectricity, dynamic systems, and control theory, where appropriate.

### **BMNG 5020 Cell and Molecular Biology Foundations for Biomedical Engineering**

CREDIT HOURS: 3

Fundamental concepts related to cell structure, function, and organization in tissues in normal physiology and disease in the context of emerging technologies for probing/manipulating cells and integrating engineering/modelling principles.

### **BMNG 5060 Introduction to Biomedical Technologies in Clinical Settings**

CREDIT HOURS: 0

This is a non-credit course which is required for the Biomedic Program - an NSERC Create training program in Biomedical Technology Innovation and Commercialization. It focuses specifically on clinical exposure and an appreciation of the challenges of device development for clinical use. Areas of exposure are in clinical ethics, principles of human physiology and pathophysiology, biomedical device certification, technology challenges in challenging environments such as the operating room and clinic and sterilization issues. Students will be directly exposed to clinical procedures and patients during the course. Enrolment is limited.

### **BMNG 5110 Biocompatibility and Biomaterials Design**

CREDIT HOURS: 3

This course deals with the scientific basis of biocompatibility (host and materials responses in biomaterials) and its application to intelligent design of biomaterials for implantable systems. The course will be divided into thirds: (i) cellular, tissue-level, and systemic responses to implanted devices, including thrombosis, wound-healing, cytotoxicity, and immunological responses; (ii) materials degradation including corrosion, dissolution, swelling/leaching, surface chemistry, etc.; (iii) case studies of materials and device design including: heart valves, total hip prostheses, dental restorative materials, total artificial heart, burn dressings and hemodialysis systems. The course will be evaluated by three literature criticism sessions, a research paper and coupled class presentation, one mid-term test and a final exam.

### **BMNG 5120 Biomechanics in Physiology and Surgical Implant Design**

CREDIT HOURS: 3

This course deals with: (i) solid and fluid mechanical analysis of biological tissues and organs, and (ii) use of mechanical engineering techniques in the design of implantable medical devices, e.g., heart valves, vascular grafts, ligament replacements, total artificial heart, and total hip or knee replacements. Topics to be covered include cell structure and mechano-electrical function, blood flow, arterial mechanics, bone structure and mechanics, mechanics and tribology of artificial joints, muscle mechanics, pulmonary functions, fundamentals of gait and mobility aids. Guest lecturers from clinical sciences will help to develop the practical context of biomechanical engineering problems.

EXCLUSIONS: MECH 4650.03

### **BMNG 5150 Introduction to Tissue Engineering**

CREDIT HOURS: 3

Tissue engineering is a recent and fast-growing field which encompasses and unites biology, chemistry, medical sciences, and engineering to design and fabricate systems to replace tissues and organs. Topics will include tissue engineering scaffolds, cell incorporation (selection and culture), in vivo versus in vitro constructs, and applications of tissue engineering.

### **BMNG 5210 Biomedical Instrumentation, Data Acquisition and Analysis**

CREDIT HOURS: 3

This hands-on course is an introduction to computer-based acquisition and analysis of physiological signals relevant to biomedical engineering. In an integrated series of lectures and laboratory projects, students will construct and use instrumentation systems to acquire signals of physiological importance (e.g., temperature, electrophysiological signals, pressure, force, flow, and sound). Issues such as filtering, sensor properties, sampling, aliasing, and frequency analysis will be explored. The first part of the course is structured as a hands-on workshop introducing students to the National Instruments Labview programming language and Labview is used throughout the course to explore signal acquisition and processing topics. Students are expected to complete a final project in which they develop and characterize a biomedical instrument.

CROSSLISTED: ECED 5210.03

FORMATS: Lecture | Lab | Experiential Learning

### **BMNG 5230 Biomedical Signal Analysis and modelling**

CREDIT HOURS: 3

This course is directed at the student interested in the analysis of physiological signals and modelling of physiological system using mathematical and computational methods. The course provides the basics of linear systems analysis and modelling and advances to nonlinear systems. Time-frequency including wavelet analysis methods are covered, and students can choose projects including a variety of novel modelling and analysis approaches applied to biomedical problems including neural networks, adaptive filtering and modelling, fractal processes, amongst others. This course is normally offered every second year.

### **BMNG 5260 Principles of Medical Imaging**

CREDIT HOURS: 3

This course will discuss the basic principles behind modern medical imaging modalities including the mathematical foundations of image process and image reconstruction from projections. the specific imaging modalities that the course covers are X-ray, CT, PET, MRI, and Ultrasound imaging. Fundamentals of ionizing radiation along with the interaction of radiation with tissue is also described. Students will all be required to perform one Magnetic resonance Imaging lab/report using a bench-top Earth field MRI system.

CROSSLISTED: ECED 5260.03

FORMATS: Lecture

### **BMNG 5270 Advanced Cardiovascular Physiology**

CREDIT HOURS: 3

This course provides a detailed overview of key concepts of cardiovascular physiology and disease, including discussion of current research in the field. Topics include cardiac anatomy/structure; electrophysiology; excitation-contraction coupling; mechanics; metabolism; nervous system control; and vasculature function. Director: T. A. Quinn

PREREQUISITES: Permission of course director

CROSSLISTED: PHYL 5568.03

EXCLUSIONS: PHYL 4680.03

FORMATS: Lecture | Discussion | Other (explain in comments)

### **BMNG 5310 Business of Medical Technology I**

CREDIT HOURS: 3

Students work in interdisciplinary teams to trial-develop a biomedical concept from idea to commercial product in this course and in the following course BMNG 5311.03. Topics covered include innovation and design methodology and industry practice, industrial design and creativity in design, intellectual property fundamentals and industry practices, medical technology development processes. Teams combine students from biomedical engineering, medical residents, and MBA programs. Enrolment is limited.

FORMATS: Lecture | Seminar

### **BMNG 5410 Directed Readings in Biomedical Engineering**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to BMNG 5420.03/BMNG 5430.03.

### **BMNG 5420 Directed Read Biomedical Eng**

CREDIT HOURS: 3

See BMNG 5410.03.

### **BMNG 5430 Directed Read Biomedical Eng**

CREDIT HOURS: 3

See BMNG 5410.03.

### **BMNG 5500 Biomedical Engineering MSc Seminar**

CREDIT HOURS: 0

All MSc students must present their thesis proposal to the department in a departmental seminar.

### **BMNG 5510 Biomedical Engineering MSc Thesis Proposal**

CREDIT HOURS: 0

Each MSc candidate in biomedical engineering must prepare a Thesis Proposal at about the one-year mark in the MSc program. The written proposal should include a title page, table of contents, introduction/literature review, thesis objectives/hypothesis, proposed methods and materials, timeline for the project, progress/results to date, and a list of references. The body of written text should not exceed 20 pages.

### **BMNG 5530 Biomedical Engineering MSc Research Day**

CREDIT HOURS: 0

All MSc students must present their research at least once at the departmental Research Day.

### **BMNG 6500 Biomedical Engineering PhD Seminar**

CREDIT HOURS: 0

All PhD students must present both their proposal and the results of their research to the department in a departmental seminar.

### **BMNG 6510 Biomedical Engineering PhD Thesis Proposal**

CREDIT HOURS: 0

In preparation for the research thesis work, each PhD candidate must first prepare and defend a PhD Thesis Proposal. Presented at about the 1-year mark in the PhD program, this 20–40-page proposal will briefly review the relevant scientific/engineering literature, present the research objectives and specific hypotheses to be tested, describe the methodology to be employed, the expected outcomes and potential pitfalls, demonstrate the likelihood of an original contribution to knowledge relevant to Biomedical Engineering.

### **BMNG 6520 Biomedical Engineering PhD Candidacy Examination**

CREDIT HOURS: 0

In the second year of the program the student will be provided with five questions related to the student's research area. The committee will select three of

these on which the student will write 15–20-page papers in the style of a journal review articles. The committee will orally examine the student both on the content of the papers and on background knowledge in the research area.

### **BMNG 6530 Biomedical Engineering PhD Research Day**

CREDIT HOURS: 0

All PhD students must present their research at least twice at the departmental Research Day.

### **BMNG 9000 MASc Thesis**

CREDIT HOURS: 0

### **BMNG 9530 PhD in Biomedical Engineering**

CREDIT HOURS: 0

## **Business**

Location:

Kenneth C. Rowe Building

6100 University Avenue

Room 4106

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number:

Fax Number:

Email Address: [M.E.Lapp@Dal.ca](mailto:M.E.Lapp@Dal.ca)

Website: [www.dal.ca/academics/programs/graduate/msc-business.html](http://www.dal.ca/academics/programs/graduate/msc-business.html)

## **Introduction**

The Master of Science in Business (MScB) is a 16-month graduate degree that prepares students for industry roles that require in-depth understanding of their field of specialization or for entering into a PhD program in business. Students develop their skills through courses in their area of specialization and by writing a thesis.

Visit the MScB website at <https://www.dal.ca/academics/programs/graduate/msc-business.html> for a complete program description and for information concerning updates to the program's regulations and course offerings.

## **Staff**

### **Program Director**

Kyung Young Lee

Email: [kyunglee@dal.ca](mailto:kyunglee@dal.ca)

Phone: 902-494-3065

Fax: 902-494-1107

### **Program Coordinator**

Maggie Lapp

Email: [M.E.Lapp@Dal.ca](mailto:M.E.Lapp@Dal.ca)

Phone: 902-494-7487

## Faculty members

Please visit <https://www.dal.ca/academics/programs/graduate/msc-business/faculty.html>

# Master of Science in Business (MScB)

## Admissions

Students entering this program must at a minimum satisfy the general requirements for admission as spelled out in the Faculty of Graduate Studies Regulations. A minimum average of letter grade B+ (75% or above) for undergraduate studies is required. Admission into the MScB program is competitive. Thus, meeting these requirements does not guarantee admission. Admission criteria include:

- Quality of academic record
- Strength of personal statement of research interest
- Letters of reference from academics in their previous institution
- Relevance of resume
- GMAT or GRE scores (if provided)

If applying from a different disciplinary background than the discipline chosen for the MScB, a qualifying year or additional courses may be necessary.

For additional requirements for admission to MScB program (including the format of 'state of research interest'), please visit <https://www.dal.ca/academics/programs/graduate/msc-business/admissions.html>

## English Language Proficiency Requirement

Information pertaining to the English language proficiency requirement is given in the [Faculty of Graduate Studies Regulations](#). Both TOEFL and IELTS results are accepted as proof of English language proficiency.

- Non-Canadian applicants whose first language is not English require a TOEFL score of at least 580, or 92 for TOEFL iBT, or an IELTS score of 7.0.

## Information and Application Forms

For further information, please visit <https://www.dal.ca/academics/programs/graduate/msc-business/program-details.html>

## Registration Requirement and Duration of Studies

A student is required to register each academic term to maintain eligibility to continue in the program. Student who enter the program meeting normal admission requirements may be able to complete the program requirements in 16 months. For information on maximum time limits for completion of program requirements, leaves of absence, and extensions, see the [Faculty of Graduate Studies Regulations](#) in this calendar.

## Degree Requirements

The Master of Science in Business at Dalhousie's [Rowe School of Business](#) is a research-oriented graduate thesis program. It is a rigorous 16-month program that provides you with enhanced opportunities to enter a PhD program in business administration or boost your career in industry with skills in academic research. Students develop their skills through courses in their area of specialization and by writing a thesis.

All students must complete the following:

- BUSS7101: Research Workshop (0 credit hours) every term of the first year
- BUSS7100: Master's Thesis (0 credit hours)
- One elective course

Students in Finance need to complete the following 15 credit hours of courses

- ECON 5575: Econometrics 1
- BUSS 6201: Theory of Finance
- BUSS 6202: Seminar in Corporate Finance
- BUSS 6292: Financial Econometrics
- BUSS 6293: Seminar in Investment

Students in Managing People and Organizations need to complete the following 15 credit hours of courses

- BUSS 6101: Research Design and Methods
- BUSS 6102: Behavioral Statistics
- BUSS 6103: Research Reading and Conference Course
- BUSS 6301: Managing People / Org Theory
- BUSS 6302: Seminar on Micro Organizational Behaviour

Students in Marketing need to complete the following 15 credit hours of courses

- BUSS 6101: Research Design and Methods
- BUSS 6102: Behavioral Statistics
- BUSS 6103: Research Reading and Conference Course
- BUSS 6401: Seminar in Marketing I
- BUSS 6402: Seminar in Marketing II

Students in MIS need to complete the following 15 credit hours of courses

- BUSS 6101: Research Design and Methods
- BUSS 6501: MIS Theory and Research
- BUSS 6102: Behavioral Statistics
- BUSS 6103: Research Reading and Conference Course
- BUSS 6502: Seminar in MIS Research

**It is recommended that students meet with an academic advisor to plan their courses based on interests, course availability and program requirements, both prior to beginning the program, and throughout their studies.**

## Business Administration

Location:

Kenneth C. Rowe Building  
6100 University Avenue  
Room 2127  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-1814 or Toll-free in NA 1-888-432-5622

Fax Number: (902) 494-7154

Email Address:

Website: <https://www.dal.ca/faculty/management/rsb/programs/mba.html>

## Introduction

The Rowe School of Business is proud to offer two distinct MBA programs.

The Corporate Residency MBA (CRMBA) offers an in-class delivery model that includes an eight-month paid corporate residency (work-term). The CRMBA program does not require previous work experience for admission. Additionally, the CRMBA program is available to students from all academic backgrounds. There are two combined programs associated with the CRMBA - the combined CRMBA/Juris Doctor (JD) program and the combined CRMBA/Master of Engineering (MEng) program.



The MBA (Financial Services) and MBA(Leadership) are blended/online MBA programs designed specifically for the mid-career professional. Online courses are delivered via the university's online learning system, each course concludes with a three and a half to four and a half day face-to-face intensive component conveniently held in cities across Canada. [Admissions and program information specific to the MBA Financial Services and Leadership](#)

## Staff

### Director, MBA Programs

**Shaw, D.**, BA (Queen's), MBA (Edinburgh)

### Professors Emeriti

**Brooks, M.**, BOT (McGill), MBA (Dalhousie), PhD (Wales)

**MacLean, L. C.**, BA, BEd (St. FX), MA, PhD (Dalhousie)

**McNiven, J. D.**, BA, MA, PhD (Mich)

### Professors

**Barker, J.**, BA (UCA), MA (Purdue), PhD (Colorado)

**Carvalho, S.**, BBA (Fortaleza), MBA (Northeastern), PhD (CUNY)

**Charlebois, S.**, BComm (Royal Military College), MBA (UQAM), DBA (Sherbrooke)

**Chen, J.**, BSc, MSc (Beijing), PhD (Western)

**Chowdhury, S.**, BCom, MCom, (Dhaka), MBA, PhD (Kentucky)

**Cunningham, P.**, BA (Queen's), MBA (Calgary), PhD (Texas A&M)

**Dana, L.P.**, BA, MBA (McGill), PhD (HEC)

**Fooladi, I.**, BS (Iran), MA (Tehran), MS, PhD (Oregon)

**Gassmann, H. I.**, Vordiplom (Stuttgart), MS (Oregon State), PhD (UBC)

**Hebb, G.**, BA (McGill), MBA (Queen's), MA (Dalhousie), PhD (Texas A&M)

**McLarney, C.**, DipRadTech (Fanshawe), BComm, MBA (Windsor), PhD (York)

**Sheehan, L.**, BSc (Alberta), MeDes, MBA, PhD (Calgary)

**Trifts, V.**, BBA (UPEI), MBA (St. Mary's), PhD (Alberta)

**Ulku, M.A.**, BSc, MSc (Turkey), PhD (Waterloo)

**Zhao, Y.**, BSc (Anhui), MSc (Kentucky), PhD (UBC)

### Associate Professors

**Aghakhani, H.**, BSc, MSc (Iran), PhD (Manitoba)

**Beaubien, L.**, BSc, BA (Dalhousie), MBA (Saint Mary's), PhD (Western)

**Deval, H.**, MA (ESC), MBA, PhD (Cincinnati)

**El Hazzouri, M.**, BBA (Lebanon), PhD (Asper)

**James, A.**, BA (Windsor), MBA, PhD (Alberta)

**Kabat-Farr, D.**, BA, MA, PhD (Michigan)

**Lee, K.**, BSc, MBA (Yonsei, South Korea), MBA (Ottawa), PhD (Western)

**Lin, S.**, BComm, MSc, PhD (Queen's)

**Nason, R.**, BSc, (McMurry), MSc (Pittsburgh), MBA, PhD (Ivey School of Business, UWO), CFA

**Pacurar, M.**, BA (Mahes-Bolyai, Romania), UIbA (Nantes/IFAG), PhD (HEC Montreal)

**Sundararajan, B.**, BEng (Mangalore), MS Eng, PhD (Rensselaer Polytechnic)

**Sy, O.**, BAA, MSc (HEC), PhD (McGill)

**Zhou, J.**, BA, BBA, MA (XJTU), MA (McGill), PhD (Toronto)

### Assistant Professors

**Baltazar, R.**, BSc (Ateneo de Manila), MA (Thunderbird), PhD (St. Mary's)

**Cloutier, A.**, BA, MA (Carleton), PhD (Queens)

**Deng, Q.**, BA, BMgt, M.Mgt (Beijing), PhD (Carleton)

**Foster, K.W.**, BEng (Royal Military College), MBA, PhD (Toronto)

**Gonzalez, P.**, BEng (Columbia), MASc (Waterloo), PhD (Queen's)

**Roach, D.**, BEng (TUNS), MBA, PhD (Dalhousie)

**Weigand, H.**, BA (Dalhousie), MBA, PhD (SMU)

**Yu, B.**, BEng (China), MSc, PhD (Concordia)

## Teaching Fellow

**Comber, S.**, BEDS (TUNS), MBA (Central Florida), MA, PhD (Fielding)

**Cumming, L.**, BComm (Dalhousie), BA (Maine), CA (NS)

## Senior Instructor

**Crowell, T.**, BComm, MBA (St. Mary's), CA

**Shaw, D.**, BA (Queen's), MBA (Edinburgh)

## Instructor

**Taylor, S.**, BComm (Calgary), CPA, CA

## Adjunct (FGS)

**Ali-Hassan, H.**, BE (AUB), MBA (McGill), PhD (York)

**Archibald, B.**, BA (Queen's), MSc (Stanford), PhD (Waterloo)

**Bliemel, M.**, BSc (Queen's), MMS (Carleton), PhD (McMaster)

**Dawkins, C.**, BSc, MA (Ohio), PhD (Ohio State)

**Schellinck, D.A.**, MBA, MSc (Dalhousie), PhD (Illinois)

# Corporate Residency MBA Program

## Admissions

[Regulations of the Faculty of Graduate Studies](#) govern admissions. Admission is approved by the Faculty of Graduate Studies, on the recommendation of the Rowe School of Business Administration. Applicants must hold a degree recognized by Dalhousie University as equivalent to a four-year bachelor's degree in one of its own faculties or any institution recognized by Dalhousie University. The minimum requirement is a B average (GPA 3.0) or better in the final two years, and a GMAT score of 550, or better.

While the Rowe School of Business values the benefits of bringing work experience to the classroom, the Corporate Residency MBA is designed for highly qualified candidates coming directly from undergraduate studies. A resume, profile and personal essay should accompany every application. Letters of reference and a successful admission interview are required.

All applicants are required to submit results of a Graduate Management Admission Test (GMAT). Information on test dates, locations and registration can be obtained from <http://www.mba.com>. The minimum score required for admission is 550. Applicants may write the test more than once. Please check with [crmba@dal.ca](mailto:crmba@dal.ca) for further information. The admissions committee may consider the results of an LSAT, GRE or MCAT test in lieu of the GMAT requirement.

Candidates whose first language is not English may be required to submit proof of English proficiency. A minimum TOEFL score of 100 or IELTS score of 8. [See Regulation 3.4](#) for more details.

The deadlines for applications are:

- For international students, the deadline is January 15.
- For Canadian students, the application deadlines will be January 15 (round 1), February 28 (round 2) and May 7 (round 3).

All applications received after the program has been filled will be considered for admission to the following year.

Interim (official) transcripts will be considered for candidates currently attending university if all other documentation is complete. Since space in the program is limited, all documents must be submitted before May 7 for entry in June. Applications will be considered for acceptance as long as space is available.

A complete application includes:

- \$115 application fee
- Faculty of Graduate Studies application forms
- Transcripts from each institution attended (two copies - both originals)
- GPA (grade point average) of 3.0 (B) or greater, last two years
- GMAT results (550 or higher)
- TOEFL results, where applicable (or MELAB, IELTS, CAEL or CanTEST)

- Two reference letters, (If you graduated five or more years ago and have been working full time during that period, you may supply one professional and one academic letter of reference.)
- Resume
- Letter of Intent
- Letter of Financial Guarantee (non-Canadian applicants)

All applicants for the Corporate Residency MBA Program must complete the Dalhousie Graduate Application form. Students can apply online at [dalgrad.dal.ca/prospectivestudents/admissions/admissioninfo](http://dalgrad.dal.ca/prospectivestudents/admissions/admissioninfo). Alternatively, a paper version of the Application Form can be at [dal.ca/admissions/apply/applying\\_as\\_a\\_graduate\\_student.html](http://dal.ca/admissions/apply/applying_as_a_graduate_student.html). The application must be accompanied by the application fee. All supporting documentation should be sent directly to the Rowe School of Business, Corporate Residency MBA Program.

Reference letters must be originals, sent directly by the referees, or delivered sealed and signed, or submitted through the Faculty of Graduate Studies e-reference system. Only official transcripts received directly from the issuing institution will be accepted. GMAT and TOEFL score reports must be forwarded by the testing service. Based on a successful review of submitted documentation, candidates will be invited to participate in an interview to assess suitability for the program and employability. Admissions decisions will be based on all required documentation and other assessment elements.

All admitted applicants must confirm in writing their acceptance of the offer of admission and provide a non-refundable deposit to the Student Accounts Office. This deposit will be applied toward tuition but will be forfeited if the student does not register in the academic year for which admitted. Orientation materials are only sent to students who have paid their deposit. There are no deferrals to June 2022 for applicants to June 2021 intake.

## Academic Standing

Advanced standing is not possible in the CRMBA program.

## Program Fees

CRMBA tuition is based on a program fee model. Fees are paid in approximate equal installments four times over the course of the program. This model means that program fees cover the cost of courses (required and elective) and a number of additional programmatic elements including aspects of the corporate residency process, the leadership and career management curriculum, innovative course elements such as intensives, supplementary course materials (e.g. integrative cases and simulations), pre-program materials and general outreach and consultation with industry to ensure that the program in all of its aspects is industry-relevant and recognized for its innovative approach to MBA education. Please note, the program fee does not include ancillary fees related to health insurance, society fees, bus pass, etc. For more information on ancillary fees please consult the fee schedule at [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca). International students are required to pay a differential fee. Additional information on differential fees can be found in the [Fees](#) section.

# Corporate Residency MBA Program

The Corporate Residency MBA focuses on preparing students to apply the theory learned in the classroom to the workplace. It is designed around the concepts of applied, experiential, and integrated learning.

The experience is an intense one, individually designed and implemented in conjunction with the development needs of the students and the needs of the employer partners.

In total the Corporate Residency MBA requires 13 core courses (39 credit hours), seven elective courses (21 credit hours), and four required non-credit courses. The program has a total of 60 credit hours.

## Summer - Year 1

BUSI 5103.03: Business Accounting  
 BUSI 5503.03: Quantitative Decision Making  
 BUSI 5703.03: Business Economics  
 BUSI 6900.03: Corporate Responsibility, Ethics and Society  
 BUSI 5000.00: Introduction to Personal and Professional Effectiveness (PPE) (non-credit)

## Fall - Year 1

BUSI 5201.03: Financial Management  
 BUSI 5401.03: Marketing Management

BUSI 5512.03: Leveraging Technology  
BUSI 5551.03: Operations Management  
BUSI 5801.03: International Business  
BUSI 5003.00: Personal and Professional Effectiveness I (non-credit)

***Winter/Spring/Summer - Year 1***

BUSI 5305.03: Managing People (online)  
BUSI 7000.03: Corporate Residency (January - August)

***Fall - Year 2***

MGMT 5000.03: Management Without Borders  
BUSI 6000.03: Strategy and Competitiveness  
BUSI 5004.00: Personal and Professional Effectiveness II (non-credit)  
Three graduate level electives

***Winter - Year 2***

BUSI 6005.03: Strategy Implementation  
BUSI 5004.00: Personal and Professional Effectiveness II (non-credit)  
Four graduate level electives

## **Combined CRMBA and Juris Doctor (JD) Program**

Students who complete the combined CRMBA and Juris Doctor (JD) program, must be admitted to each program independently. Each student is required to complete 13 core courses (39 credit hours), four elective courses (12 credit hours), and required non-credit courses of the CRMBA, thereby completing a total of 51 credit hours of the CRMBA program. For more information regarding the JD requirements for students enrolled in the combined degree, please consult the [Law Calendar](#). The suggested sequence is as follows:

***Summer - Year 1***

BUSI 5703.03: Business Economics  
BUSI 5103.03: Business Accounting  
BUSI 5503.03: Quantitative Decision Making  
BUSI 6900.03: Corporate Responsibility, Ethics and Society  
BUSI 5000.00: Introduction to Personal and Professional Effectiveness (PPE) (non-credit)

***Fall - Year 1***

BUSI 5201.03: Financial Management  
BUSI 5401.03: Marketing Management  
BUSI 5512.03: Leveraging Technology  
BUSI 5551.03: Operations Management  
BUSI 5801.03: International Business  
BUSI 5003.00: Personal and Professional Effectiveness I (non-credit)

***Winter/Spring/Summer - Year 1***

BUSI 5305.03: Managing People (online)  
BUSI 7000.00: Corporate Residency (January - August)

***Year 2***

In year 2 students are full time JD students (see program requirements in the [Law Calendar](#)). There are no MBA requirements during this period.

**First Year JD Courses**

LAWS 1000X/Y.06: Contracts and Judicial Rule-Making  
LAWS 1001X/Y.06: Criminal Justice  
LAWS 1002.01: Orientation to Law  
LAWS 1003X/Y.05: Fundamentals of Public Law  
LAWS 1004X/Y.03: Legal Research and Writing  
LAWS 1005X/Y.06: Property in Historical Context

LAWS 1006X/Y.06: Tort Law and Damage Compensation  
LAWS 1008.01: Introduction to Legal Ethics  
LAWS 1009X/Y.02 : Aboriginal and Indigenous Law in Context

### ***Year 3***

BUSI 6000.03: Strategy and Competitiveness (fall)  
BUSI 6005.03: Strategy Implementation (winter)  
One graduate level elective (three credit hours) (winter)  
JD Requirements include:  
LAWS 2061X/Y.05: Civil Procedure  
LAWS 2062X/Y.05: Constitutional Law  
LAWS 2201X/Y.01: Compulsory Moot  
A major paper course  
7-9 hours of law courses from the “Business Law” area (detailed in the [Law Calendar](#))  
Other elective courses for a total of 23-25 law credits

### ***Year 4***

MGMT 5000.03: Management Without Borders (fall)  
Three graduate level electives (total of 9 credit hours) (one fall; two winter)  
JD Requirements include:  
LAWS 2099.02: The Legal Profession and Professional Responsibility  
A major paper course  
Three to five hours of law courses from the “Business Law” area  
Other elective law courses for a total of 23-25 law credits

## **CRMBA/Master of Engineering (MEng)**

This is a two-year program that enables students to select courses which will allow them to graduate with a Master of Engineering and Master of Business Administration. This combination provides graduates with a diverse skill set in two high demand disciplines. Candidates for the CRMBA/MEng program must satisfy the entrance requirements for both the Faculty of Engineering and the Rowe School of Business. Students may obtain further information about the combined program by contacting the Faculty of Engineering or the Admissions Officer of the CRMBA program.

Students enrolled in the combined program are required to complete the following courses in the CRMBA program: 13 core courses (39 credit hours), three elective courses (nine credit hours), and three required non-credit courses, thereby completing a total of 48 credit hours of the CRMBA program. For detailed information on the MEng program requirements; please consult the appropriate section of the Graduate Calendar. The suggested sequence is as follows:

### ***Summer - Year 1***

BUSI 5103.03: Business Accounting  
BUSI 5503.03: Quantitative Decision Making  
BUSI 5703.03: Business Economics  
BUSI 6900.03: Corporate Responsibility, Ethics and Society  
BUSI 5000.00: Introduction to Personal and Professional Effectiveness (PPE) (non-credit)

### ***Fall - Year 1***

BUSI 5201.03: Financial Management  
BUSI 5401.03: Marketing Management  
BUSI 5512.03: Leveraging Technology  
BUSI 5551.03: Operations Management  
BUSI 5801.03: International Business  
BUSI 5003.00: Personal and Professional Effectiveness I (non-credit)

### ***Winter/Spring/Summer - Year 1***

BUSI 5305.03: Managing People (online)  
BUSI 7000.00: Corporate Residency (January - August)

### ***Fall - Year 2***

BUSI 6000.03: Strategy and Competitiveness  
MGMT 5000.03: Management Without Borders  
One CRMBA elective (three credit hours)  
Engineering courses: two graduate courses plus seminar

#### ***Winter - Year 2***

BUSI 6005.03: Strategy Implementation  
Two CRMBA electives (graduate level; three credit hours each)  
Engineering courses: three graduate courses plus seminar

#### ***Summer - Year 2***

Engineering requirement: Graduate Project  
During this semester it may be possible to complete one of the above-mentioned electives

## **MBA (Financial Services/Leadership)**

### **MBA (Financial Services)**

The MBA Financial Services helps managers in the financial services industry enhance their skills by furthering their abilities to exercise management and make sound business decisions, honing their analytical skills, and sharpening their judgment in managerial and client service roles. The stream broadens the horizons of financial managers by exposing them to business concepts necessary inside and outside the industry, thereby enhancing performance in their present positions and increasing their scope of career opportunities. Successful applicants integrate their new knowledge into their everyday job responsibilities. Each completed course builds students business knowledge and helps their careers progress within the financial services industry.

MBA Financial Services stream is specifically tailored to the financial services sector of the business world. There are several paths designed specifically for various banking, wealth management, financial planning, benefits planning, pension benefits, and insurance institutions. The MBA Financial Services stream has well-established affiliations with leading financial educational institutions which will provide you with excellent learning potential and advanced placement opportunities.

### **MBA (Leadership)**

The MBA Leadership is designed to enable mid-career professionals to enhance their management capabilities and to become exceptional leaders and managers in a broad range of organizations. Our faculty specialize in leadership theory and practice and will help you develop advanced competencies, skills and behaviours required to lead people and organizations through complex issues. This stream enables students to respond strategically to management challenges and work towards your career goals, without leaving the workforce.

Upon completion of the MBA Leadership, students will have a comprehensive knowledge of fundamental and contemporary leadership theories, enhanced by the ability to integrate leadership around current issues of global change, strategic innovation, and the capacity to handle complex situations in today's organization.

### **Program Overview**

The MBA Financial Services and MBA Leadership are part-time programs designed for working professionals.

The streams consists of 42 credit hours; it comprises a core of 10 (30 credit hours) mandatory courses and 4 (12 credit hours) specialized courses.

MBA Financial Services or Leadership offers three academic terms: fall, winter, and summer, and traditionally students in the program will take one or two courses per term, given that they are working professionals, undertaking their degree while continuing their careers. As such, students take an average of three - four courses per year, usually completing their degrees in four years. As with other part-time graduate programs at Dalhousie, students must complete the program requirement in seven years from the date first admitted.

### **Program Delivery: Online/Blended**

The part-time MBA Financial Services and the MBA Leadership streams are delivered using a blended learning model, combining online and classroom instruction. The flexible course schedule allows students the opportunity to continue their academic studies

while working on their professional career goals. The 3.5 to 4.5 day face-to-face intensive sessions are offered in Toronto, Vancouver, Calgary, and Halifax.

Each course is organized around a 14-week term, which involves synchronous and asynchronous online learning. Asynchronous resources include readings, videos, discussion posts, blogs, and audio files. The synchronous elements include live Classroom, tutorials, collaborate, Adobe Connect, and Skype sessions. At the end of each term, students gather in person, in major cities across the country (based on critical mass of students), for their intensive; sessions are led in person by the course instructor. These sessions are designed to apply and consolidate the learning which has taken place online in the course of the term. Intensives consist of activities such as simulations, presentations, panels, and guest speakers, designed to enhance students' application of what they have learned. The final intensive takes place on the Dalhousie campus.

## Admission Requirements

Regulations of the Faculty of Graduate Studies govern admissions. Admission is approved by the Faculty of Graduate Studies, on the recommendation of the School of Business Administration. Applicants must hold a degree recognized by Dalhousie University as the equivalent of a four-year Bachelor's Degree in one of its own faculties or an institution recognized by Dalhousie University. The minimum requirement is a B average (GPA 3.0 on a 4.3 scale). Applicants must also have a least five years relevant professional experience.

\* Applicants who do not meet the standard academic criteria are required to submit a Prior Learning Assessment Portfolio and/or a GMAT (results of 550 or higher)

A complete application includes:

- Faculty of Graduate Studies Application Form:
  - Online version: <https://dalonline.dal.ca>
  - Paper version: [www.dal.ca/admissions/apply/applying\\_as\\_a\\_graduate\\_student.html](http://www.dal.ca/admissions/apply/applying_as_a_graduate_student.html)
- \$115 Application Fee
- Letter of Intent
- Resume/Job Description
- Two reference letters - You must provide two references, preferably from supervisors (former or current) OR one supervisor and one academic. The Faculty of Graduate Studies reserves the right to request additional references. These must come directly from your referees in a sealed envelope. All references are considered confidential and as such cannot be returned to you. Your referees may use the forms provided below or write a letter of recommendation. Their original ink signature must be included.
- Confirmation of Employment
- Official Transcripts - Original and official transcripts are required from any/all post-secondary institutions attended. All transcripts (including English translations) must bear the official stamp/seal of the issuing institution and must be forwarded directly to Dalhousie University. Transcripts that state "issued to student" are not acceptable.
- TOEFL results, where applicable

It is the policy of Dalhousie University to confirm the authenticity of transcripts and letters of reference of all recommended applicants

All admitted applicants must confirm acceptance in writing and provide a non-refundable deposit to the Student Accounts Office. This deposit will be applied toward tuition but will be forfeited if the student does not register in the academic year for which he or she was admitted. Please note that this deposit is separate from any application or pre-registration fees.

## MBA (Financial Services/Leadership) Program

### *Core Courses:*

- BUSI 5103.03: Business Accounting
- BUSI 5503.03: Quantitative Decision Making
- BUSI 5511.03: Management Information Systems
- BUSI 5703.03: Business Economics

- BUSI 5801.03: International Business
- BUSI 6207.03: Advanced Corporate Finance
- BUSI 6326.03: Management Skills Development
- BUSI 6410.03: Advanced Marketing
- BUSI 6900.03: Corporate Social Responsibility, Ethics and Sustainability
- BUSI 6990.03: Strategic Leadership and Change

### ***(Financial Services)***

#### ***Specialized Courses:***

- BUSI 6230.03: Investment and Money Management
- BUSI 6255.03: Global Markets and Institutions
- BUSI 6300.03: Risk Management for Financial Institutions
- BUSI 6601.03: Legal Aspects of Risk Management

### ***(Leadership)***

#### ***Specialized Courses:***

- BUSI 6994.03: Leading in Complexity
- BUSI 6995.03: Leading in Context
- BUSI 6996.03: Sustainable Leadership
- BUSI 6997.03: Leading with Responsibility

## **Advanced Standing/Advanced Placement**

Consult Department

## **Program Continuance**

Students of the Centre for Executive and Graduate Education (CEGE) who wish to refrain from taking courses during a fall, winter or summer term may pay a \$50 fee and submit a Program Continuance form to maintain their registration status. In cases where no appropriate courses are offered for that term, the fee will be waived but the Program Continuance form must be submitted. The form must be originated and signed by the student and the Program Manager and approved by the Faculty of Graduate Studies. Students are permitted unlimited program continuances over their seven-year completion period; however, the period a student is on Program Continuance is counted toward the seven-year completion limit. Program Continuance applies to students in the MBA (FS)/(L), and MPA (M), and MIM programs only.

## **Contact**

Students seeking further information should contact the Centre for Executive and Graduate Education (CEGE):

Telephone: (902) 494-6391

Toll free: 1 (800) 205-7510

Fax: (902) 494-5164

Email: [cege@dal.ca](mailto:cege@dal.ca)

Website: [dal.ca/onlinemba](http://dal.ca/onlinemba)

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## **Corporate Residency MBA (and combined degrees) Course Descriptions**



## Core Credit Courses

- BUSI 5103.03: Business Accounting
- BUSI 5201.03: Financial Management
- BUSI 5305.03: Managing People
- BUSI 5401.03: Marketing Management
- BUSI 5503.03: Quantitative Decision Making
- BUSI 5512.03: Leveraging Technology
- BUSI 5551.03: Operations Management
- BUSI 5703.03: Business Economics
- BUSI 5801.03: International Business
- BUSI 6000.03: Strategy and Competitiveness
- BUSI 6005.03: Strategy Implementation
- BUSI 6900.03: Corporate Responsibility, Ethics and Society
- MGMT 5000.03: Management Without Borders
- BUSI 5000.00: Introduction to Personal and Professional Effectiveness (PPE)
- BUSI 5003X/Y.00: Personal & Professional Effectiveness I: Leadership and Career Management
- BUSI 5004X/Y.00: Personal & Professional Effectiveness II
- BUSI 7000.00: Corporate Residency

## Elective Courses

Not all electives are offered each term. As well, additional electives may be added. With the approval of the School, students may select electives from other Schools in the Faculty of Management or other Faculties. Please check with the Corporate Residency MBA office for the latest information.

- BUSI 5100.03: Organizational Designs for Governance and Public Management
- BUSI 5120.03: Introduction to Public Policy
- BUSI 5902.03: Starting Lean
- BUSI 6002.03: New Venture Creation
- BUSI 6006.03: Managing the Family Enterprise
- BUSI 6007.03: Innovation Management
- BUSI 6009.03: Business and Government
- BUSI 6019.03: Managing Business Government Relations
- BUSI 6044.03: Industrial Sustainability
- BUSI 6050.03: Corporate Governance
- BUSI 6101.03: External Auditing
- BUSI 6102.03: Taxation
- BUSI 6106.03: Cost Management
- BUSI 6108.03: Advanced Financial Accounting I
- BUSI 6109.03: Advanced Financial Accounting II
- BUSI 6110.03: Advanced Financial Accounting III
- BUSI 6207.03: Advanced Corporate Finance
- BUSI 6220.03: Risk and Derivatives
- BUSI 6230.03: Investment and Money Management
- BUSI 6240.03: Analyzing Financial Statements
- BUSI 6255.03: Global Markets and Institutions
- BUSI 6300.03: Risk Management for Financial Institutions
- BUSI 6313.03: Organizational Change
- BUSI 6350.03: Authentic Leadership for the 21st Century
- BUSI 6408.03: Transport Modes
- BUSI 6412.03: Consumer Behavior
- BUSI 6414.03: Global Marketing
- BUSI 6450.03: Marketing Strategy Seminar
- BUSI 6511.03: Business Process Integration Using ERP Systems
- BUSI 6513.03: Business analytics and Data Visualization

- BUSI 6516.03: Database Management
- BUSI 6525.03: User Experience
- BUSI 6555.03: Supply Chain Management
- BUSI 6941.03: Applied Topics in Business I
- BUSI 6942.03: Applied Topics in Business II
- BUSI 6951.03: Research, Reading and Conference Class
- BUSI 6952.03: Research, Reading and Conference Class

## **MBA (Financial Services/Leadership) Course Descriptions**

**Note: Format for all MBA (Financial Services/Leadership) Courses: Distance/online and 3.5-4.5 days (classroom) intensive session**

### **Core Credit Courses**

- BUSI 5103.03: Business Accounting
- BUSI 5503.03: Quantitative Decision Making
- BUSI 5511.03: Management Information Systems
- BUSI 5703.03: Business Economics
- BUSI 5801.03: International Business
- BUSI 6207.03: Advanced Corporate Finance
- BUSI 6326.03: Management Skills Development
- BUSI 6410.03: Marketing
- BUSI 6900.03: Corporate Social Responsibility, Ethics and Sustainability
- BUSI 6990.03: Strategic, Leadership and Change

### **Elective Courses (Financial Services)**

- BUSI 6230.03: Investment and Money Management
- BUSI 6255.03: Global Markets and Institutions
- BUSI 6300.03: Risk Management for Financial Institutions
- BUSI 6601.03: Legal Aspects of Business

### **Elective Courses (Leadership)**

- BUSI XXXX.03: Leading for Success
- BUSI 6994.03: Leading in Complexity
- BUSI 6995.03: Leading in Context
- BUSI XXXX.03: Leading Professionally

## **Course Descriptions**

### **BUSI 5000 Introduction to Personal and Professional Effectiveness (PPE)**

CREDIT HOURS: 0

This course aims to develop key skills and knowledge students need to succeed in the MBA program and future careers. Business skills such as presentation and public speaking, interviewing, networking, critical thinking, conflict management and etiquette will be enhanced through workshops and interaction with employer partners and alumni. A general understanding of business functions, work processes and managerial decision-making will be acquired through case studies and a business simulation. As well, students will receive an orientation to the Faculty of Management, information resources and managing with integrity.

RESTRICTIONS: Restricted to Corporate Residency only

FORMATS: Lecture | Seminar | Discussion

### **BUSI 5003 Personal & Professional Effectiveness I**

CREDIT HOURS: 0

The Personal and Professional Effectiveness (PPE) curriculum was developed using input from our Employer Partners and Advisory Council and is honed through continuous feedback from these stakeholders. This ensures that our students have the relevant, practical leadership skills and behaviours they

need to be effective in the workplace. Anchored by the core pillars of self-management, engagement, complexity and innovation, the curriculum provides you with the opportunity to explore and develop skills and behaviours related to responsible leadership and career management. Beginning with Orientation, the PPE curriculum spans the 22 months of the Corporate Residency MBA program. The format of the PPE curriculum is innovative, applied and experiential.

PREREQUISITES: BUSI 5000.03

RESTRICTIONS: Restricted to Corporate Residency only

FORMATS: Lecture | Seminar | Discussion | Experiential Learning

### **BUSI 5004 Personal & Professional Effectiveness II**

CREDIT HOURS: 0

In the second year of the program, Personal and Professional Development continues to support the development and refinement of skills and competencies needed for successful careers with leading organizations. At this stage, MBA candidates will build on the experience gained in their Corporate Residency to refine their strengths. Special attention will be given to establishing effective feedback systems and mechanisms to identify and address professional and personal learning needs related to career goals. Action learning sets will continue to be a key element of this process.

PREREQUISITES: BUSI 7000.03

RESTRICTIONS: Restricted to Corporate Residency only

FORMATS: Lecture | Seminar | Discussion | Experiential Learning

### **BUSI 5100 Organizational Designs for Governance and Public Management**

CREDIT HOURS: 3

This course examines the organizational designs of government for the purposes of governance and public management. It encompasses the basic constitutional and political designs of government; the structures and principles governing the relationship between the partisan-political and non-partisan public-service institutions of government; the organization and roles of the central executive and corporate policy and management agencies; the organization of portfolios, departments and agencies for the management of policy and operational functions; and, the structures and processes of accountability for governance and public management. The course is focused on the Canadian system of government but addresses basic questions of organizational theory and design in a comparative context.

CROSSLISTED: PUAD 5100.03

### **BUSI 5103 Business Accounting**

CREDIT HOURS: 3

This course introduces fundamental accounting principles and practices used to measure financial results of an organization. A portion of the course examines the challenges of financial reporting to stakeholders. The course also explores the use of accounting information for managerial decision making.

FORMATS: Lecture | Seminar | Discussion | Other (explain in comments)

### **BUSI 5120 Introduction to Public Policy**

CREDIT HOURS: 3

This course provides a general introduction to the field of policy management, for graduate and honours undergraduate students. Using British 'best practice' ideas of professional policy making and Canadian statements of generic policy competencies, it seeks to improve the policy capacity of participants. It does this first by increasing their knowledge of public policy structures, processes, and outputs, and secondly, by giving them knowledge that they can use in policy advocacy both inside and outside government. The first section of the course examines policy definitions and professional policy making approaches in the 21st century. The second section considers the role of the state in the 21st century, and the policy competencies that analysts must have if that role is to be carried out effectively. Section three explores vertical, horizontal, and external policy relationships, both as determinants of policy and as practical matters of management. Section four explores, and helps participants to gain proficiency in, the most recent processes of strategic policy design and implementation. This blend of theory and practice will increase the policy knowledge of all participants, and equip those who are in professional programs, including the various public services, to contribute more effectively to policy processes in the future.

CROSSLISTED: PUAD 5120.03

### **BUSI 5201 Financial Management**

CREDIT HOURS: 3

Financial Management provides a comprehensive framework for analyzing and understanding the financial issues faced by finance professionals in the corporate, financial, and capital markets sectors. The course emphasizes a blend between the theoretical and the practical and provides students with a basis for integrating financial concepts in other disciplines as well as advanced finance related courses. The tools and techniques of finance are introduced along with the theory, but always with the end goal of implementation in the corporate, small business, institutional, or investment settings.

PREREQUISITES: BUSI 5103.03, BUSI 5503.03, and BUSI 5703.03

RESTRICTIONS: Restricted to Corporate Residency only

FORMATS: Lecture | Seminar | Discussion

### **BUSI 5305 Managing People**

CREDIT HOURS: 3

This course offers an exploration of the theory and practice involved in working with people in organizations, from both formal and informal leadership perspectives. The emphasis is on understanding individual (micro) and organizational (macro) factors and the processes through which they influence behaviour, with a view to improving managerial effectiveness. Students have the opportunity to develop and apply this understanding through experiential exercises, case studies and assignments situated in real organizations.

FORMATS: Online Delivery

### **BUSI 5401 Marketing Management**

CREDIT HOURS: 3

Marketing is the business function responsible for understanding the needs of consumers, suppliers, and retailers and for creating value for these and other stakeholder groups. As such, it is more than a department within a firm - it is a function that must be undertaken on a company-wide basis. Marketing drives choices about what markets to serve and which needs to satisfy, about what partnerships and relationships to pursue, about product and service design, about prices that can be levied, and about the channels that can best be used for distribution and communication.

FORMATS: Lecture | Seminar | Discussion

### **BUSI 5503 Quantitative Decision Making**

CREDIT HOURS: 3

This is an introductory course in quantitative methods with emphasis on business applications. Throughout this course an emphasis is placed on helping the student to recognize situations and areas in business in which quantitative analysis might be useful.

FORMATS: Lecture | Seminar | Discussion | Other (explain in comments)

### **BUSI 5511 Management Information Systems**

CREDIT HOURS: 3

This course is meant to provide the student with a basic knowledge of information systems and their role in business organizations. Fundamental to this basic knowledge is an understanding of the variety of information systems in business. An understanding of the use of computers in current and future information systems is stressed.

FORMATS: Other (explain in comments)

### **BUSI 5512 Leveraging Technology**

CREDIT HOURS: 3

This course is meant to provide the student with a basic knowledge of information systems and their role in business organizations. Fundamental to this basic knowledge is an understanding of the variety of information systems in business. An understanding of the use of computers in current and future information systems is stressed.

RESTRICTIONS: Restricted to Corporate Residency only

### **BUSI 5551 Operations Management**

CREDIT HOURS: 3

All managers should be familiar with the key concepts and techniques required to manage the production function of an organization regardless of their specialist functional interests. This is especially true for those who aspire to reach senior general management positions. The purpose of this course is to provide an introductory overview of production/operations management for such individuals, covering the key concepts and the latest developments in the field.

RESTRICTIONS: Restricted to Corporate Residency only

FORMATS: Lecture | Seminar | Discussion

### **BUSI 5703 Business Economics**

CREDIT HOURS: 3

Domestic and international markets, governments policy and central bank decisions present opportunities, challenges, and threats to the operating and competitive decisions of business owners, managers and investors. This course provides a framework for the economic analysis of these issues.

FORMATS: Lecture | Seminar | Discussion | Other (explain in comments)

### **BUSI 5801 International Business**

CREDIT HOURS: 3

This course provides a survey treatment of international businesses that will benefit all MBA students and build a foundation for those proposing future study in this area. For students not going on in the field, it provides the tools needed to manage the interdependence between domestic and international markets.

FORMATS: Lecture | Seminar | Discussion | Other (explain in comments)

### **BUSI 5902 Starting Lean**

CREDIT HOURS: 3

This course provides real world, hands-on learning on what it is like to actually start a scalable company or enterprise. This course is not about how to write a business plan. It is not an exercise on how smart you are in a classroom, or how well you use the research library to size markets. And the end result is not a PowerPoint slide deck for a VC presentation. This is a practical course - essentially a lab, not a theory or 'book' course. You will be getting your hands dirty talking to customers, partners, and competitors, as you encounter the chaos and uncertainty of how a startup actually works. You will work in teams learning how to turn a great idea into a great company. You will learn how to use a business model to brainstorm each part of a company and customer development to get out of the classroom to see whether anyone other than you would want/use your product. Each day will be a new adventure outside the classroom as you test each part of your business model, then share your hard earned knowledge with the rest of the class.

CROSSLISTED: MGMT 3902.03

### **BUSI 6000 Strategy and Competitiveness**

CREDIT HOURS: 3

This course is about the general manager's task of managing strategy in all types of organizations. The course develops concepts, frameworks, techniques, and skills that are foundational to the development and execution of strategies that are competitively sound, organizationally doable, and effective in guiding organizational decisions and actions.

PREREQUISITES: BUSI 7000.03

RESTRICTIONS: Restricted to Corporate Residency only

FORMATS: Lecture | Seminar | Discussion

### **BUSI 6002 New Venture Creation**

CREDIT HOURS: 3

New Venture Creation is about entrepreneurship: the process of creating new businesses. It employs cases, experiential exercises, and a major project to expose students to the issues, problems, and challenges of creating viable new businesses. The project provides students with the opportunity, within the framework of a formal course, to explore and develop business ideas they have been considering or wish to investigate. The final output of the project is a feasibility study, business plan, and financing proposal for a new venture.

CROSSLISTED: ECMM 6024.03

FORMATS: Lecture | Seminar

### **BUSI 6005 Strategy Implementation**

CREDIT HOURS: 3

This course is about the general manager's task of managing strategy in all types of organizations. The course develops concepts, frameworks, techniques, and skills that are foundational to the development and execution of strategies that are competitively sound, organizationally doable, and effective in guiding organizational decisions and actions.

PREREQUISITES: BUSI 6000.03

RESTRICTIONS: Program: Juris Doctor & M Busi Admin , Master of Business Admin Level: Graduate

FORMATS: Lecture | Seminar | Discussion

### **BUSI 6006 Managing the Family Enterprise**

CREDIT HOURS: 3

Managing the Family Enterprise is about the special problems and issues that confront family businesses. It explores the family system, the business system, and their interactions - functional and dysfunctional.

CROSSLISTED: COMM 3308.03, MGMT 3308.03

EXCLUSIONS: COMM 3308.03, MGMT 3308.03

FORMATS: Lecture | Seminar

### **BUSI 6007 Innovation Management**

CREDIT HOURS: 3

Managing innovation is at the core of most successful business ventures. Successfully managing innovation depends on its alignment with the firm's business, marketing, and operational strategies. This course leads students through the process of identifying innovation opportunities; managing the innovation process and executing entrepreneurial marketing strategies to successfully manage emerging ventures.

FORMATS: Lecture | Seminar

### **BUSI 6009 Business and Government**

CREDIT HOURS: 3

The aim of this course is to explore the relationship between businesses and the public sector. Government impinges on business policy and activities through laws, regulations, subsidies, taxes, and its spending powers. How businesses can and do influence decisions in these areas constitutes the technical matter of the course. As a matter of necessity, the course assumes some prior general knowledge of the Canadian political system. This can be gained from either general politics courses or by some preliminary reading on the subject.

CROSSLISTED: PUAD 6500.03

FORMATS: Lecture | Seminar

### **BUSI 6019 Managing Business Government Relations**

CREDIT HOURS: 3

Public policy can impact the business climate and operating context for specific firms. This course prepares future industry leaders to work, with government and civil society, through the study of business regulation. Participants will explore how to structure and manage business-government relations within administrative law, public consultation, and lobbying processes.

PREREQUISITES: BUSI 6900.03

FORMATS: Lecture

### **BUSI 6044 Industrial Sustainability; Patterns for Sustainable Industrial Development**

CREDIT HOURS: 3

It is becoming increasingly obvious that human economies depend on the products and services provided by healthy, functioning ecological systems. By studying the flow of materials and energy through industrial systems, industrial ecology identifies economic ways to lessen negative environmental impacts - through pollution prevention, innovative waste management strategies, improved energy efficiency, design for the environment, and promoting sustainability - within the carrying capacity of the surrounding ecosystems. The course will also include the social dimensions relating to industrial ecology by focusing on the organizational management dimensions that are related to the reduction of industrial emissions, waste flows, energy use and usage of materials within in-company procedures and beyond the level of single organizations. The format will include lectures, seminars, discussion, and guest speakers.

CROSSLISTED: ENVI 5044.03

FORMATS: Seminar

### **BUSI 6050 Corporate Governance**

CREDIT HOURS: 3

Corporate Governance is designed to give students an in-depth look at the corporate governance triad, as indicated above, that controls the modern corporation. Accordingly, this course will deal with the control, composition, functions, roles, and structure of boards; board responsibility and accountability, CIO tenure and compensation, shareholder, and other stakeholder representation; corporate boards vis-à-vis social responsibility and ethics; and comparative corporate governance across North America, Europe, and selected Asian countries.

PREREQUISITES: BUSI 5201.03, BUSI 6000.03 and BUSI 7000.03

FORMATS: Lecture

### **BUSI 6101 External Auditing**

CREDIT HOURS: 3

This course covers the theory and practice of public auditing according to generally accepted auditing standards (GAAS). The first half of the course considers the forces impacting on the setting of auditing standards and the current level of standards. This part includes pronouncements of the accounting profession, reporting standards, professional ethics, statute laws, legal liability and responsibilities, standards for examination of internal control in both manual and computerized environments, standards for quality of evidence, statistical sampling and the sufficiency of evidence, documentation and working papers. The second half of the course considers typical audit programs for examination of balance sheet and income statement accounts.

PREREQUISITES: BUSI 5103.03

### **BUSI 6102 Taxation**

CREDIT HOURS: 3

An introduction to the taxation system in Canada, with special reference to the provisions of the Income Tax Act and their effects on business decisions. The measurement process used to determine the tax base are examined, and the basic elements in the calculation of tax payable for individuals and corporations are discussed.

PREREQUISITES: BUSI 5103.03

CROSSLISTED: COMM 4120.03

FORMATS: Lecture

### **BUSI 6104 Income Tax Design**

CREDIT HOURS: 3

This is an elective MBA course intended to provide a foundation in income tax frameworks. It should be of great interest to all MBA students for four main reasons. First, almost all business transactions are informed by, if not motivated and explained by, their tax consequences. (This is also the case for much human behaviour.) Second, tax is pervasive. Studying the income tax consequences of transactions such as sale and leasebacks, weak currency loans, commodity straddles, financial derivatives and corporate mergers is a good way to learn about those transactions themselves. Third, income tax frameworks are intellectually fascinating. At its most elemental level, tax involves taking one simple idea — the idea that everyone should pay tax on their income — and then applying that idea to the full panoramic variety of economic and property relations and transactions that characterize our modern, complex society. To determine each individual's income, the infinite variety of human activity must be classified under this single rubric. Do individuals earn taxable income in the following situations: When they receive an interest-free loan from their parents? When are they awarded a scholarship? When they benefit from the use of the heavily subsidized recreational facilities at university? This course is for any student who has an interest in understanding more about the world. It will be relevant whether you work with or for small or large businesses, non-profit or charitable organizations, or whether you are simply interested in how tax frameworks apply to you personally. The course does not have a fixed disciplinary focus: it is not a course in tax accounting, tax economics or tax law. Instead, the course offers an overview about how income tax frameworks are developed by policy makers in countries around the world. Students will not leave the course with a detailed understanding of Canada's income tax law or accounting principles — there are other courses at Dalhousie that can assist with those. Instead, you will leave this course with the ability to identify the core components of all tax law frameworks alongside the major policy decisions that countries make in choosing how to resolve thorny questions like whether or not to allow loss consolidation, how to tax in-kind benefits received by employees, and the appropriate timing for deductions.

PREREQUISITES: Core MBA courses or permission of the instructor

FORMATS: Discussion

### **BUSI 6106 Cost Management**

CREDIT HOURS: 3

The major objective of this course is to develop a deeper understanding of the key topics in cost/managerial accounting practices and their management control implications. The selected topics to be covered include costing systems, cost-volume-profit analysis, cost and profit variance analysis, control, and performance evaluation in decentralized organizations. This course is intended primarily for students who plan to concentrate their studies in the accounting area.

PREREQUISITES: BUSI 5103.03

FORMATS: Lecture | Discussion

### **BUSI 6108 Advanced Financial Accounting I**

CREDIT HOURS: 3

This course is intended to provide an understanding of corporate financial reporting model and related conceptual issues. The course will develop expertise in accounting and reporting issues related to liabilities and shareholders' equity, including complex debt and equity instruments, corporate income taxes, leases, pensions and other post-retirement obligations, earnings per share, accounting changes and restatements.

PREREQUISITES: BUSI 5103.03

CROSSLISTED: COMM 3111.03

FORMATS: Lecture

### **BUSI 6109 Advanced Financial Accounting II**

CREDIT HOURS: 3

This course provides an in-depth study of the interrelated topics of intercorporate investments, business combinations, consolidated financial statements and foreign currency transactions and foreign operations. The course also covers segmented reporting and bankruptcy.

PREREQUISITES: BUSI 6108.03

### **BUSI 6110 Advanced Financial Accounting III**

CREDIT HOURS: 3

This course provides a theoretical framework for the study of accounting policy. Case analysis is an integral part of the course. Topics covered include accounting policy choice in a dynamic framework, partnerships, standard setting, not-for-profit accounting, and fund accounting. As well the course may consider various practical and theoretical topics, and current topics as appropriate.

PREREQUISITES: BUSI 6108.03

CROSSLISTED: COMM 4101.03

FORMATS: Lecture

### **BUSI 6207 Advanced Corporate Finance**

CREDIT HOURS: 3

This is an advanced course that offers a variety of applied topics in corporate finance. The emphasis will be on implementing the tools and techniques of the finance theory and as such will have a strong applied or case-based component.

PREREQUISITES: BUSI 5103.03 (MBA FS) or BUSI 5103.03 and BUSI 5201.03 (Corporate Residency)

FORMATS: Other (explain in comments)

### **BUSI 6215 Foundations of Fintech**

CREDIT HOURS: 3

The financial services landscape has been strongly impacted by emerging technologies and financial innovation stemming from disruptors on the fringe of the industry and incumbents' urge to respond to these developments. Defined as organizations combining innovative business models and technology to enable, enhance and disrupt financial services (EY, 2017), FinTech (or financial technology) has the potential to profoundly change the way banks conduct their business. Once regarded as a threat, the financial technology industry nowadays attracts investments from almost every global bank, lured by the promise of significant cost savings and efficiency gains. This course exposes students to the rapidly evolving FinTech landscape. After a high-level overview of the traditional financial system to ensure the class is familiar with the basic financial industry structure, we will proceed into looking at how this industry is disrupted by new technologies. We examine the main changes happening in the financial industry and the factors driving the unprecedented growth in the use of technology; what FinTech is, the main trends related to Fintech, the components of the FinTech ecosystem, and the emerging Fintech innovations. The first wave of Fintech led to the unbundling of banking, i.e., fintech startups have challenged banks vertically on one of their core functions by providing better and cheaper options. This part will focus on Fintech companies competing with incumbents in the personal finance, payments, lending, capital markets, wealth management, insurance, and money transfer sectors. The next generation of Fintech's that are moving beyond their initial mono-product and into rebundling will also be examined. We will also discuss the threat to the sector posed by the Big Tech companies that are moving into financial services. A distinctive component of the course will be regularly focused on aspects around the launching of a Fintech start-up.

PREREQUISITES: BUSI 5201

FORMATS: Lecture

### **BUSI 6220 Risk and Derivatives**

CREDIT HOURS: 3

This course is an introduction to risk, enterprise management and derivatives. As a survey course in risk and derivatives, the goal is to cover the central concepts and issues that will permit the student to start using the concepts and products as well as have a working understanding of the main advantages and disadvantages of each. The goal of the course is not solely on the quantitative models themselves, but also on the qualitative issues. Nevertheless, risk management and derivatives is a quantitative subject, and as such, students be comfortable with basic statistics and algebra. Knowledge of calculus is not required for this course. Additionally, students should be comfortable with basic Excel mathematical and financial functions.

PREREQUISITES: BUSI 5201.03

FORMATS: Lecture | Discussion

### **BUSI 6230 Investment and Money Management**

CREDIT HOURS: 3

This course is designed to introduce students to the basics of the Modern Investment and Portfolio Theory and its application to Money management. The intention is to provide students with the needed technical and operational skills to successfully face the challenging world of investments and money management. In particular, a considerable effort will be made to compare and contrast investment approaches in various theories with the activities of money managers on the street.

PREREQUISITES: BUSI 6207.03

FORMATS: Lecture | Seminar | Discussion | Other (explain in comments)



### **BUSI 6240 Analyzing Financial Statements**

CREDIT HOURS: 3

This course is intended to provide an analytical understanding of the usefulness of conventionally reported financial data in investment and credit decision-making. It covers major financial reporting issues within the context of predicting future earnings and the role of financial institutions in capital markets.

### **BUSI 6255 Global Markets and Institutions**

CREDIT HOURS: 3

Global Markets and Institutions is an introduction to the world of global finance. It has been designed to give a theoretical background to topics such as financial institutions and current markets and to explain how these impact the world economy. Throughout the course, application to real-life examples will be used extensively.

PREREQUISITES: BUSI 5103.03 or BUSI 6207.03

FORMATS: Lecture | Seminar | Discussion | Other (explain in comments)

### **BUSI 6300 Risk Management for Financial Institutions**

CREDIT HOURS: 3

Risk Management for Financial Institutions is a comprehensive introduction to the tools and techniques of enterprise risk management in financial institutions. The course covers basic and advanced risk concepts dealing with the management and operations of financial institutions and the development of financial products.

### **BUSI 6313 Organizational Change**

CREDIT HOURS: 3

This course provides the student with an understanding of major conceptual approaches to the changing organization, including changing people, technology, and structure. Emphasis is placed on the analysis of the dynamics and process of change through case studies, and the exploration of programs of organizational change, including grid and laboratory programs, and the use of consultation.

FORMATS: Lecture | Seminar

### **BUSI 6326 Management Skills Development**

CREDIT HOURS: 3

This course exposes students to key knowledge, skills, and attitudes (KSAs) considered critical to managerial success. Such exposure is designed to provide the student with behaviours that will help ensure that, when managing human resources, staff will perform at or near peak capabilities. This is a skill-building course. Significant amounts of classroom time are devoted to behaviour modeling exercises, role-plays, case studies, and group discussions.

### **BUSI 6350 Authentic Leadership for the 21st Century**

CREDIT HOURS: 3

There are few topics in business that receive as much attention as does the topic of 'leadership.' The opinions range from the centrality of leadership to success to the theory that leadership is a romantic conception that does not exist, nor impact outcomes, in the real world. This course will examine that range of opinions and research findings about leadership, as part of the search for understanding of what leadership is to the individual and to the organizational world at large. As future leaders, you need to understand what constitutes effective and ethical leadership. This course then will also include learning about oneself as a leader, as well as about the topic of leadership in the abstract.

FORMATS: Lecture | Discussion

### **BUSI 6408 Transport Modes**

CREDIT HOURS: 3

This course will introduce the student to the business of managing a transport enterprise. It will focus on understanding the regulatory environment and customer requirements prior to exploring operational considerations across a number of transport modes and what that means for marketing the transport company and structuring it for growth. The course is suitable for students wishing to work in the transport industry, in the supply chain activities of a transport customer or, tangentially, in the strategic management of any service business.

CROSSLISTED: COMM 3408.03

FORMATS: Lecture | Seminar

### **BUSI 6410 Advanced Marketing**

CREDIT HOURS: 3

Students will develop the ability to understand an industry from the point of view of a marketing manager. Students also develop the capability to prepare a market analysis and a marketing strategy.

FORMATS: Other (explain in comments)

### **BUSI 6412 Consumer Behavior**

CREDIT HOURS: 3

Every stage of the marketing process, from determining consumers' needs to evaluating customer satisfaction, requires a clear understanding of the consumer. The goal of this course is to introduce you to the theories and concepts related to all aspects of consumer behaviour, including theories of attitude formation and change, memory, decision-making, cultural influences, and behavioural outcomes. Throughout the course, an emphasis will be placed on applying theoretical knowledge to various marketing situations.

PREREQUISITES: BUSI 5401.03

FORMATS: Lecture | Discussion

### **BUSI 6450 Marketing Strategy Seminar**

CREDIT HOURS: 3

This is the capstone course in marketing. As such, it is designed to draw together the individual marketing courses offered in the MBA programs. Extensive use will be made of case studies requiring students to develop complete marketing strategies for companies in "real-life" situations. Student presentations of their case analyses will form an important part of the course. Presentations will be videotaped, and a critique provided by the instructor.

PREREQUISITES: BUSI 5401.03 and BUSI 7000.03 and one 6000-level marketing course, which may be taken concurrently, or permission of the instructor

FORMATS: Seminar

### **BUSI 6510 Optimization Modelling**

CREDIT HOURS: 3

Managers and business leaders should be constantly seeking ways to optimize resources and efficiencies; minimize risks, costs, and waste; and thereby maximize both their organization's as well as their own professional and personal success. With these same goals in mind, this course will show how optimization can be used to guide managerial decisions or inform best policies in many different situations and business analytics applications. Several case studies or examples will come from finance, management, marketing, operations and production, or supply chain sustainability, and will be chosen to cover a wide spectrum of modeling dichotomies including linear vs. nonlinear, discrete vs. continuous, static vs. dynamic, and deterministic vs. stochastic.

### **BUSI 6511 Business Process Integration Using ERP Systems**

CREDIT HOURS: 3

Enterprise Systems are comprised of a unified database with shared analysis and reporting tools allowing for real time business intelligence across global operations. Emphasis in this course is equally on learning business processes and integration between different functional areas as it is about the technology that facilitates this. This course will be taught in the teaching labs with a combination of individual and group simulations interspersed with short lectures. An active learning approach in this course will include hands-on learning using SAP ERP, as well as ERPSim, a game-based SAP ERP simulation. Here you will learn to manage companies from end-to-end using the actual SAP ERP in a real-time simulated competitive environment and will learn the processes, gain technical skills with SAP, and playfully learn how Enterprise Systems facilitate Business Intelligence which can be used to lead a company in a competitive environment.

PREREQUISITES: BUSI 5512.03

FORMATS: Lecture | Lab

### **BUSI 6513 Business analytics and Data Visualization**

CREDIT HOURS: 3

This course provides an introduction to Business Analytics and Data Visualization. It covers the processes, methodologies and practices used to transform the large amounts of business and public data into useful information to support business decision-making. Students will learn how to extract and manipulate data from these systems. They will also acquire basic knowledge of data mining and statistical analysis, with a focus on data visualization. The students will also learn to build and use management dashboards and balanced scorecards using a variety of data design and visualization tools. The course will be made up of a combination of conceptual and applied topics with classes being held in a computer lab. Technologies to be used will be focused on end-user analytics and data visualization and will include state of the art tools for self-serve business analytics.

PREREQUISITES: BUSI 5512.03 or permission of instructor.

### **BUSI 6516 Data Management**

CREDIT HOURS: 3

Database design and administration are at the core of any organization's information system. Any MIS professional needs to understand the fundamentals of organizational and network database design and the new technique of object-oriented analysis. The student will develop an appreciation of current problems in database design and administration.

PREREQUISITES: BUSI 5512.03

EXCLUSIONS: BUSI 6906.03 (former number)

FORMATS: Lecture | Seminar

### **BUSI 6525 User Experience**

CREDIT HOURS: 3

People frequently interact with information using technical tools. This seminar-style course explores how humans perceive information, and the resulting implications on how we present usable, effective, and accessible information. Adopting a user-centered design philosophy, we will explore methods and processes for assessing, evaluating, and improving the usability of information systems.

CROSSLISTED: INFO 6630.03

RESTRICTIONS: MLIS, MLIS/JD, MLIS/MPA, MLIS/MREM

FORMATS: Lecture | Seminar

### **BUSI 6555 Supply Chain Management**

CREDIT HOURS: 3

A Supply Chain consists of all parties involved in fulfilling a customer request. Efficient integration of suppliers, manufacturers, distribution/logistics companies, and retailers/customers is vital in managing supply chains so that the right products are delivered to the right place at the right price, at the right quantity, and at the right time. Good management of a supply chain creates a competitive advantage. Focusing on the planning and execution of supply chain decisions, this course will help students have a deep understanding of supply chains, acquire analytical tools necessary to solve complex supply chain problems, and apply managerial levers to pull in order to sustainably improve supply chain performance.

PREREQUISITES: BUSI 5551.03, or ECMM 6020.03 or permission of the instructor

FORMATS: Lecture

### **BUSI 6601 Legal Aspects of Business**

CREDIT HOURS: 3

This course focuses on law and legal compliance from the perspective of managing risk. Being the only legal aspects course in the program, it establishes a foundation in the most relevant areas of law, including torts, contracts, interventions by equity, insurance, and business associations. It also considers the real-world problems faced by those engaged in the practice of corporate governance.

### **BUSI 6802 Strategic Management of International Operations**

CREDIT HOURS: 3

This course critically examines the generic and functional strategies open to multinational enterprises and, through numerous industry and business case studies, seeks to test the applicability of these concepts to actual situations. Each student is expected to prepare a major research paper, and a simulated negotiation is included to help sharpen top management skills crucial for success in international operations.

PREREQUISITES: BUSI 5801.03

FORMATS: Seminar

### **BUSI 6900 Corporate Responsibility, Ethics and Society**

CREDIT HOURS: 3

This course introduces students to the relevance and importance of ethics and social responsibility in business. The ultimate intent of the course is to leave students better equipped to identify, think critically about, and resolve ethical issues that are encountered in one's working life at the individual, organizational, and societal levels.

FORMATS: Lecture | Seminar | Discussion | Other (explain in comments)

### **BUSI 6914 Social Capital**

CREDIT HOURS: 3

The pressures of globalization, technological change, industry restructurings, and growing public demands for ethical conduct and environmental stewardship require modern business leaders to collect, analyze, and act upon a range of information. The discovery of innovative solutions for difficult and complex problems requires an appreciation for the patterns of information flows in and around organizations. To locate and capitalize upon this information, business leaders require an understanding of social capital — a resource for producing value that lies within one's relationships with others. The course provides students with knowledge of the origins and benefits of both individual and organizational social capital. It prepares the successful student to undertake transformative leadership roles in organizations of varying sizes and purposes.

PREREQUISITES: BUSI 6900

### **BUSI 6941 Applied Topics in Business I**

CREDIT HOURS: 3

This course is designed to permit the business school to develop and test new course material. Its content may therefore be different from year to year and between sections. Please consult the department for further information.

CALENDAR NOTES: SIGNATURE REQUIRED

FORMATS: Seminar

### **BUSI 6942 Applied Topics in Business II**

CREDIT HOURS: 3

This course is designed to permit the business school to develop and test new course material. Its content may therefore be different from year to year and between sections. Please consult the department for further information.

PREREQUISITES: All first-year core courses

FORMATS: Seminar

### **BUSI 6951 Research, Reading and Conference Class**

CREDIT HOURS: 3

This course provides an opportunity for supervised in-depth research on a topic of special interest to the student (proposed by the student and faculty member involved and approved by the MBA Program Committee). Further description is available at the MBA Office at 494-1814 or mbacr@dal.ca. Deadlines for electronic submission of proposals are September 2, December 1, and April 1 for the following term (one time only). Proposals must be accompanied by name of supervising professor. Once approved by the MBA Program Committee, the student may engage in the project. NOTE: Course details listed here also apply to BUSI 6952.03.

CALENDAR NOTES: SIGNATURE REQUIRED

### **BUSI 6952 Research, Reading & Conference Class**

CREDIT HOURS: 3

See BUSI 6951.03.

### **BUSI 6970 Applied Topics in Business III**

CREDIT HOURS: 3

This course is designed to permit the business school to develop and test new course material. Its content may therefore be different from year to year and between sections. Please consult the department for further information.

PREREQUISITES: All first-year core courses

FORMATS: Seminar

### **BUSI 6990 Strategic Leadership and Change**

CREDIT HOURS: 3

The Strategic Leadership and Change course is the capstone course in the MBA (Financial Services) and MBA (Leadership) programs. It provides students with the ability to integrate the concepts and techniques developed in earlier courses. Strategy-formulation abilities are enhanced, and strategy implementation is emphasized. Students are able to develop and apply the skills necessary in managing organizational change.

FORMATS: Other (explain in comments)

### **BUSI 6994 Leading in Complexity**

CREDIT HOURS: 3

Leading in Complexity introduces you to the key theories and practices of Organizational Complexity and to give you an understanding of the principles used to develop and move forward leadership initiatives in today's complex organizations.

RESTRICTIONS: Restricted to MBA Leadership students

FORMATS: Online Delivery | Other (explain in comments)

### **BUSI 6995 Leading in Context**

CREDIT HOURS: 3

Leadership is one of the most studied topics in the management discipline. Despite this, there are few absolutes, although successive waves of research have suggested different prescriptive approaches. This course is rooted in the view that, while much of what constitutes effective leadership is constant, its implementation can and should vary, depending on the context. Therefore, following two content modules on leader traits and behaviors, the course will cover four context modules on follower and organizational characteristics that could significantly impact leader performance.

CALENDAR NOTES: Online/Distance with on-site 3.5 day intensive

RESTRICTIONS: Restricted to MBA Leadership students

FORMATS: Other (explain in comments)

### **BUSI 6996 Sustainable Leadership**

CREDIT HOURS: 3

This course is designed to introduce students to the fundamental key concepts, theories and best practices of the holistic and triple-bottom-line approach to leading organizations sustainably. This course will focus on complexity of organization decision making and the impact these decisions make to society, the environment, individuals, and public stakeholders. Furthermore, students will understand how managers and leaders use qualitative skills to create value in a complex organization (e.g., how managers use heuristics to derive knowledge based on both quantitative and non-quantitative information). Topics covered include moving from data to information to knowledge to action; leadership reasoning skills such as reasoning from context cues, reasoning from competing knowledge sources (e.g., competing stakeholder expectations), reasoning from qualitative information; and persuasive skills. Students will be exposed to general management and organizational theories, articles on the various types of organizational issues, and leadership styles and practices. The context of all the discussions will revolve around how sustainable leadership practices can help organizations be centres of sustainable operations.

COREQUISITES: none

PREREQUISITES: none

CROSSLISTED: none

RESTRICTIONS: Restricted to MBA FSL students

FORMATS: Seminar | Online Delivery

### **BUSI 6997 Leading with Responsibility**

CREDIT HOURS: 3

This course is designed to prepare future organizational leaders for taking responsibility for the success of an organization through sound ethical practices. The course integrates and emphasizes practical skills for dealing effectively with the most difficult ethical dilemmas, choices, and constraints facing today's organizations. The course also emphasizes on-line research and networking to facilitate continual leadership learning and effective personal adaptation to ever-increasing environmental complexity. Action-learning components include the development of a personal leadership philosophy and practice positional plan that the student can take forward into future work.

RESTRICTIONS: Restricted to MBA Leadership students

FORMATS: Lecture | Online Delivery | Other (explain in comments)

### **BUSI 7000 Corporate Residency**

CREDIT HOURS: 0

The eight-month corporate residency focuses on enhancing human capital, leadership development and the creation of social capital in organizations. Since job assignments and action learning are effective ways to develop leadership skills, the overall purpose of the residency is to provide students with an opportunity to bridge the practice and science of leadership development by showing the importance of building both human and social capital in organizations. Ways that this can be achieved include 360-degree feedback; experiential skill development programs; on-the-job learning projects; professional reading and reflective conversations; executive coaching; mentoring; networking.

PREREQUISITES: BUSI 5000.03, BUSI 5103.03, BUSI 5201.03, BUSI 5801.03, BUSI 5401.03, BUSI 5503.03, BUSI 5512.03, BUSI 5551.03, BUSI 5703.03, BUSI 6900.03

RESTRICTIONS: Restricted to Corporate Residency only

FORMATS: Other (explain in comments)

## **Chemistry**

Location:  
Chemistry Building  
6274 Coburg Road  
2nd Floor, Room 212  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3305  
Fax Number: (902) 494-1310  
Email Address: [chemistry@dal.ca](mailto:chemistry@dal.ca)  
Website: [chemistry.dal.ca](http://chemistry.dal.ca)

## Introduction

Programs leading to MSc and to PhD degrees are offered. Research for these degrees can be undertaken in analytical, inorganic, organic, physical/theoretical chemistry, or combinations thereof.

## Staff

### Chairperson of Department

**Schepp, N. P.**, BSc, PhD (Toronto)

### Graduate Coordinator

**Zhang, P.**, BSc, MSc (Jilin Univ, China), PhD (Western)

### Professors Emeriti

**Becke, A. D.**, BSc (Queen's), MSc, PhD (McMaster), FRSC, FRS, FCIC, Killam Chair in Computational Science, Shirreff Chair of Chemistry. New theoretical and computational methods for the electronic structure of atoms, molecules, and solids

**Boyd, R. J.**, BSc (UBC), PhD (McGill), FCIC, Alexander McLeod Professor of Chemistry. Quantum chemistry; reaction mechanisms; density functional theory and biomolecules

**Burnell, D. J.**, BSc, MSc (Carleton), PhD (UNB), Synthetic and mechanistic organic chemistry

**White, M. A.**, BSc (Univ of Western Ontario), PhD (McMaster), OC, FRSC, Harry Shirreff Professor of Chemical Research (Emerita) and cross-appointment with Physics and Atmospheric Sciences. Physical chemistry, Materials Energy, Thermal properties of materials, Materials science, Energy storage

### Professors

**Andreas, H. A.**, BSc, PhD (Calgary). Electrochemistry of energy storage, particularly the self-discharge of aqueous supercapacitors

**Bearne, S. L.**, BSc (Acadia), PhD (Toronto), MDCM (McGill), cross-appointment from Biochemistry and Molecular Biology. Biological chemistry, enzymology, kinetics, enzyme inhibition, drug design, enzyme evolution, proteomics, organic synthesis

**Dahn, J. R.**, BSc (Dalhousie), MSc, PhD (UBC), cross appointment from Physics and Atmospheric Science. Canada Research Chair in Battery and Fuel Cell Materials, NSERC/3M Canada Inc. Industrial Research Chair.

**Doucette, A. A.**, BSc (Dalhousie), PhD (Alberta). Analytical mass spectrometry; biological sample analysis; expression proteomics; multiplexed separations; protein labelling and fluorescence

**Freund, M.**, BSc, PhD (Florida). cross-appointment with Physics and Atmospheric Science. Electrochemistry; conjugated polymers; solar fuels; artificial photosynthesis; organic electronics; machine olfaction; surface science

**Jakeman, D. L.**, BSc, PhD (Sheffield), cross-appointment from College of Pharmacy. Applications of enzymes and carbohydrates, protein engineering, medicinal chemistry

**Johnson, E. R.**, BSc (Carleton), PhD (Queen's). cross-appointment with Physics and Atmospheric Science. Herzberg-Becke Chair in Theoretical Chemistry. Density-functional theory of electronic structure, intermolecular interactions

**Martin, R. V.**, BS (Cornell), MSc (Oxford), PhD (Harvard), cross-appointment from Physics and Atmospheric Science. Atmospheric chemistry and the use of satellite and suborbital measurements to improve the understanding of climate and air quality

**Obrovac, M. N.**, BSc (SFU), MSc, PhD (Dalhousie), cross-appointment with Physics and Atmospheric Science and Industrial Research Chair in Materials Science. New Materials for advanced batteries, electrochemistry, inorganic materials synthesis, nanostructured materials

**Rainey, J. K.**, BSc (Guelph), MSc, PhD (Toronto), cross-appointment from Biochemistry and Molecular Biology and Director of NMR-3. Biophysical chemistry, protein structure, dynamics and self-assembly

**Stradiotto, M.**, BSc, PhD (McMaster), FRSC, Alexander McLeod Professor of Chemistry. Organometallic chemistry  
**Thompson, A.**, BSc (Leicester), PhD (Sheffield), Faculty of Science Killam Professor. Synthesis and applications of homochiral dipyrromethene complexes; asymmetric catalysis; new methodology for the synthesis of important pyrroles  
**Turculet, L.**, BSc (MIT), PhD (Berkeley). Synthetic inorganic and organometallic chemistry and reactivity; new materials synthesis  
**Wentzell, P. D.**, BSc (Dalhousie), PhD (Mich State), Chemometrics; sensors; continuous flow analysis  
**Zhang, P.**, BSc, MSc (Jilin Univ, China), PhD (Western), cross-appointment with School of Biomedical Engineering (SBME). Materials science, nanoscience and technology, synchrotron spectroscopy, biotechnological applications of nanocrystals  
**Zwanziger, J. W.**, BA (Chicago), PhD (Cornell), Canada Research Chair in NMR Studies of Materials and cross-appointment with Physics and Atmospheric Science. Materials science: structure, bulk properties, and synthesis

### Associate Professors

**Cozens, F. L.**, BSc (York), PhD (Toronto). Nanosecond laser flash photolysis, physical organic chemistry in homogeneous and heterogeneous media  
**Schepp, N. P.**, BSc, PhD (Toronto). Biologically important reactive intermediates, nanosecond laser flash photolysis  
**Speed, A. W.**, BSc (Dalhousie), PhD (Harvard). Synthesis, catalysis, organic chemistry, main group chemistry, photoredox

### Assistant Professor

**Chitnis, S.**, PhD (Victoria). Redox-active main group centres; Lewis super acids, inorganic polymers and clusters  
**Dasog, M.**, BSc (Saskatchewan), PhD (Alberta). Energy, nanomaterials, semiconductors, photonics, catalysis, surface chemistry, optoelectronics

### Adjunct (FGS)

**Boyd, R. J.**, BSc (UBC), PhD (McGill), FCIC, Alexander McLeod Professor of Chemistry. Quantum chemistry; reaction mechanisms; density functional theory and biomolecules  
**Burnell, D. J.**, BSc, MSc (Carleton), PhD (UNB), Synthetic and mechanistic organic chemistry  
**Chatt, A.**, BSc (Calcutta), MSc (Roorkee), MSc (Wat), PhD (Toronto), FCIC, Dalhousie University. Nuclear and bioanalytical methods; trace elements in the environment  
**Grindley, T. B.**, BSc, MSc, PhD (Queen's), FCIC, Dalhousie University. Carbohydrate chemistry; molecular modeling, synthesis  
**Grossert, J. S.**, BSc, MSc, PhD (Natal), FCIC, Dalhousie University. Mass spectrometry and organosulphur chemistry  
**Kelly, A. T.**, BSc (Memorial), PhD (Toronto). Quantum dynamics, statistical mechanics, charge transfer, energy transfer, photochemistry, spectroscopy, reaction rates, reaction mechanisms  
**Matta, C.**, BPharm Sci (Alexandria Univ, Egypt), Graduate Diploma in Health and Hospital Administration (National Institute of Management, Egypt), PhD (McMaster), Mount Saint Vincent University. Computational and theoretical chemistry  
**Miles, C.**, BSc, MSc, PhD (Univ of Waikato). Algal toxin and mycotoxin chemistry  
**Pinto, D. M.**, BSc (McGill), PhD (Alberta), Institute for Marine Biosciences. Bioanalytical chemistry with expertise in the development of analytical technologies for proteomics  
**Quilliam, M.**, BSc, PhD (Manitoba), Institute for Marine Biosciences. The chemistry and analysis of algae biotoxins  
**Ramaley, L.**, BA (Colorado), MA, PhD (Princeton), FCIC, Dalhousie University. Mass spectrometry and chemical instrumentation  
**Werner-Zwanziger, U.**, Vordiplom (Mathematics), Diploma (Chemistry), PhD (Westfälische Wilhelms-Universität Münster, Germany), Dalhousie University. Solid-state nuclear magnetic resonance, ceramics, biomaterials  
**White, R. L.**, BSc (Dalhousie), PhD (McMaster), FCIC. Biosynthesis of natural products and enzymes of secondary metabolism

### Adjunct (Retired)

**Becke, A. D.**, BSc (Queen's), MSc, PhD (McMaster), FRSC, FRS, FCIC, Killam Chair in Computational Science, Shirreff Chair of Chemistry. New theoretical and computational methods for the electronic structure of atoms, molecules, and solids  
**White, M. A.**, BSc (Univ of Western Ontario), PhD (McMaster), OC, FRSC, Harry Shirreff Professor of Chemical Research (Emerita) and cross-appointment with Physics and Atmospheric Sciences. Physical chemistry, Materials Energy, Thermal properties of materials, Materials science, Energy storage

## Admission Requirements

Programs leading to MSc and to PhD degrees are offered. Research for these degrees can be undertaken in analytical, inorganic, organic, physical/theoretical chemistry, or combinations thereof.

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. In addition, prospective students from outside North America and Western Europe should arrange for submission of the results of the General Graduate Record Examination (GRE). For those whose first language is not English, an English language competency test is required. Details of

approved English tests and associated minimum scores can be found by consulting Section 2.4 in the [Faculty of Graduate Studies Regulations](#).

## General Regulations

All graduate students are required to carry out novel, original research. In addition, all graduate students are required, as part of their training, to instruct in the undergraduate laboratories, to present and participate in departmental graduate student seminars, and to attend invited speaker departmental seminars.

Further details of degree regulations are presented in the Graduate Students' Handbook, which may be obtained from the Departmental Office.

## Master of Science (MSc) Degree

### Full-time Program

Six credit hours and one departmental graduate student seminar, together with the presentation and oral defence of a thesis based on original research are required. Faculty regulations permit an MSc candidate to graduate after 12 months of resident study. Experience has shown that most MSc candidates in the Department require at least 20 months to complete their work.

### Part-time Program

The full-time MSc course requirements and thesis regulations apply. The thesis must be supervised by a member of the Department.

## Doctor of Philosophy (PhD) Degree Program

Students are required to successfully present departmental graduate Seminar-I (unless completed previously as part of an MSc in Chemistry at Dalhousie University) and Seminar-II. A PhD qualifying examination is normally completed within 18 months of their start date. Original research, together with preparation and oral defence of a thesis, is required. In terms of coursework, candidates proceeding from a BSc degree toward the PhD degree normally require a minimum of six credit-hours of Core Chemistry Classes (5000-level). An additional six credit-hours of graduate classes are required, which must include at least three credit-hours of 6000-level (1.5 credit-hours) Chemistry Graduate Modules. These classes may not have been used towards any other degree. Candidates proceeding from an MSc degree in Chemistry from Dalhousie University must complete at least six credit-hours in addition to the credit obtained for the MSc degree, and at least three credit-hours (either completed as part of the MSc degree in Chemistry from Dalhousie University or as part of the PhD degree in Chemistry at Dalhousie University) must be from 6000-level Chemistry Graduate Modules. Candidates proceeding from an MSc degree in chemistry from another institution may receive credit (not more than three credit-hours) for a one-term graduate-level class, but the student must request advanced placement.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### CHEM 5102 Organotransition Metal Chemistry

CREDIT HOURS: 3

Organotransition metal chemistry has grown over the last several decades into one of the most important areas of research and development in inorganic chemistry. In this course the most important types of organic ligands and their bonding characteristics are surveyed, as are the most important reaction pathways such as migratory insertion, oxidative addition, nucleophilic addition, etc. The course concludes by examining homogeneous catalysis by organotransition metal complexes.



### **CHEM 5105 Inorganic Materials Synthesis**

CREDIT HOURS: 3

Preparation of advanced functional inorganic materials for energy, optoelectronics, catalysis, and other applications are presented. Topics in the course include solid-state chemistry, sol-gel synthesis, nucleation and growth of nanoparticles, thin film fabrication, and soft lithography.

CALENDAR NOTES: Winter Term

EXCLUSIONS: CHEM 4105

FORMATS: Lecture

### **CHEM 5201 Advanced Topics in Separations**

CREDIT HOURS: 3

This course deals mainly with chromatography and associated techniques; in particular, gas chromatography in its regular, capillary, and supercritical forms, high-pressure liquid (including ion) chromatography, capillary electrophoresis, and gas and liquid chromatography combined with other instrumental techniques such as mass spectrometry. The original ideas behind the design of separation media and detection modes are emphasized, and their consequences for the analysis of living and environmental systems.

### **CHEM 5205 Chemometrics**

CREDIT HOURS: 3

Chemometrics has been defined as the application of mathematical, statistical, and formal logic methods to chemical measurements. This course will introduce some topics in this area with a greater emphasis on what can be accomplished with chemometric tools and their proper use rather than on the rigorous mathematical details.

CROSSLISTED: CHEM 4205.03

### **CHEM 5206 Bioanalytical Mass Spectrometry**

CREDIT HOURS: 3

This course offers a thorough treatment of modern mass spectrometry. The first part of the course covers the design of modern instrumentation with the emphasis on use in bioanalytical chemistry. The second major topic is an examination of some fundamental physics and chemistry of ions in the gas phase. The third part is a summary of modern applications with particular attention to the roles of mass spectrometry in drug discovery, proteomics, and environmental chemistry.

### **CHEM 5301 Theory of Chemical Bonding**

CREDIT HOURS: 3

This course surveys contemporary methods for electronic structure calculations. The emphasis is on the qualitative features and physical basis of molecular orbital theory and its application to chemistry. Empirical, semi-empirical, and ab initio methods are included. Each student is expected to undertake a computational project relevant to her or his research interests.

### **CHEM 5302 Introduction to Surface Science**

CREDIT HOURS: 3

The fundamental theory and principles of surface science are introduced. Topics include the atomic structure of solid surfaces, thermodynamic and kinetic properties of surfaces, electronic and bonding behavior of surfaces, catalytic processes by surfaces, and typical surface analysis techniques.

PREREQUISITES: CHEM 2301.03 and CHEM 2304.03 or PHYC 3200.03 or PHYC 3640.03

CROSSLISTED: CHEM 4302.03

FORMATS: Lecture

### **CHEM 5303 Physical Properties of Materials**

CREDIT HOURS: 3

The course will provide a broadly based introduction to the physical properties of materials, including optical, thermal, electronic, magnetic, and mechanical properties. In addition, it will provide more in-depth coverage of matters concerning lattice dynamics and related phononic properties of solids.

### **CHEM 5304 Kinetics and Catalysis**

CREDIT HOURS: 3

This course relates the properties of molecules in motion to the rates of chemical changes. Collision, transition state and diffusion theories are applied to

significant industrial, biological, and atmospheric process. Photochemistry, and its converse, luminescence, are interpreted. Mechanisms of catalyst activity are discussed. In assignments, students apply theories to systems of their own choice.

### **CHEM 5305 Introductory Statistical Thermodynamics**

CREDIT HOURS: 3

The principles of statistical mechanics are introduced and the relationship between the laws of thermodynamics and the underlying microscopic processes is examined. Wherever possible applications to chemical systems are emphasized, and overview is given of modern techniques, with particular attention to computer simulation.

### **CHEM 5311 Fundamental Applied Electrochemistry**

CREDIT HOURS: 3

A broad introduction to the fundamentals of electrochemistry, including electrochemical theory, double layer modelling and electrochemical methods. Additionally, important electrochemical applications will be discussed, including corrosion, energy production and storage (fuel cells, batteries and supercapacitors) and sensors (biosensors).

PREREQUISITES: CHEM 2301.03 and CHEM 2304.03

CROSSLISTED: CHEM 4311.03

### **CHEM 5312 Advances in Battery, Fuel Cell and Supercapacitor Materials**

CREDIT HOURS: 3

This course will present the cutting-edge advances in the materials used in energy storage systems, such as batteries (particularly Li-on batteries), fuel cells and supercapacitors. Discussions will include component materials (electrodes, electrolytes, separator) and full devices.

PREREQUISITES: CHEM 4311.03/ CHEM 5311.03 or permission of the instructor

FORMATS: Lecture

### **CHEM 5401 Synthesis in Organic Chemistry**

CREDIT HOURS: 3

A number of important organic reactions are examined in depth with particular attention to regioselectivity and the development of relative or absolute stereochemistry. Applications of these reactions in the synthesis of complex molecules are illustrated with recent examples from the literature.

CROSSLISTED: CHEM 4401.03

### **CHEM 5402 Organic Structure Determination**

CREDIT HOURS: 3

This course uses all spectral techniques in a problem-based approach to teach methods for the determination of structures of organic compounds. The course material mainly focuses on nuclear magnetic resonance spectroscopy with some attention to mass spectrometry. Topics include proton, carbon, and heteroatom chemical shifts and coupling constants, relaxation, dynamic NMR, and one-dimensional and two-dimensional experiments.

CROSSLISTED: CHEM 4402.03

### **CHEM 5403 Organic Reaction Mechanisms**

CREDIT HOURS: 3

The fundamental concepts of bonding, structure, and dynamic behaviours of organic compounds are discussed. Methods for determining the mechanisms of organic reactions are discussed. Topics include applications of kinetic data, linear free energy relationships, acid and base catalysis, concerted reactions and the importance of orbital symmetry, steric effects, solvent effects, and isotope effects.

### **CHEM 5502 Polymer Science**

CREDIT HOURS: 3

This course will cover aspects of synthesis, analysis, characterization, structure and uses of synthetic and naturally occurring macromolecules. Emphasis will be on the application of standard methods of organic synthesis, analytical separations, and physico-chemical characterization. In addition, students will carry out independent literature projects.

### **CHEM 5504 Diffraction Techniques in Solid State Chemistry**

CREDIT HOURS: 3

All chemical elements and compounds can exist as crystalline solids. This course studies the arrangements of atoms and molecules in such solids and examines the methods used to determine these structures. Particular emphasis is placed on the techniques of X-ray crystallography.

### **CHEM 5509 Graduate Student Seminar I**

CREDIT HOURS: 0

All MSc and PhD students are required to participate in the Graduate Student Seminar program every year. MSc and PhD students will be required to prepare and present one Departmental Seminar within the first two years of study, normally in the winter term of the second year. Seminar I shall be formatted as a scientific research lecture and shall focus on a chemistry topic that is in the current chemical literature and not related to the student's research topic. Graduate Student Seminar I has the purpose of broadening the graduate student's outlook and understanding of Chemistry. Evaluation will be based on preparation, presentation skills, scientific content, ability to field questions and regular attendance. Graded pass/fail.

### **CHEM 5601 Principles of Biomolecular and Drug Molecule Design**

CREDIT HOURS: 3

An introductory level course in biomolecular design, drug design, and medicinal chemistry. The course covers both general principles of drug design and biochemical considerations in drug design. The fundamental goal of the course is to give student the necessary tools "to take a human or veterinarian pathological problem and to sit down and initiate the process of designing new chemical structures as putative therapeutics for the disease in question." Students in chemistry are strongly recommended to take Chemistry 3601 prior to registering in this course.

PREREQUISITES: CHEM 2402.03 or permission of the instructor

CROSSLISTED: CHEM 4601.03

### **CHEM 5602 Biophysical Characterization of Macromolecules**

CREDIT HOURS: 3

Covers methods allowing determination of sub-molecular and atomic-level structure and dynamics of biomacromolecules in physiological settings (e.g., solution-state or lipid bilayers) including fluorescence, electronic and vibrational circular dichroism and NMR spectroscopy; light vs. X-ray vs. neutron scattering; and single molecule methods.

CROSSLISTED: BIOC 4702.03, BIOC 5702.03, CHEM 4602.03

### **CHEM 5603 Structural Biology**

CREDIT HOURS: 3

Please refer to the course description for BIOC 5703.

CROSSLISTED: BIOC 5703.03

EXCLUSIONS: BIOC 4703, CHEM 4603

FORMATS: Lecture

### **CHEM 6151 Organometallic Structure and Bonding**

CREDIT HOURS: 1.5

This advanced course features a survey of important structural and bonding concepts in organometallic chemistry, with particular emphasis on transition metal complexes.

PREREQUISITES: CHEM 4101.03, or CHEM 4102.03, or CHEM 4120.03 or permission of the instructor

FORMATS: Lecture

### **CHEM 6152 Organometallic Reactivity**

CREDIT HOURS: 1.5

This advanced course features a survey of important reactivity concepts in organometallic chemistry.

PREREQUISITES: CHEM 4101.03, or CHEM 4102.03, or CHEM 4120.03 or permission of the instructor

FORMATS: Lecture

### **CHEM 6153 Organometallic Characterization Methods**

CREDIT HOURS: 1.5

This advanced course features a survey of important structural elucidation techniques used in modern organometallic and inorganic chemistry.

PREREQUISITES: CHEM 4101.03, or CHEM 4102.03, or CHEM 4120.03 or permission of the instructor

FORMATS: Lecture

### **CHEM 6154 Organometallic Catalysis**

CREDIT HOURS: 1.5

This advanced course features a survey of catalytic transformations mediated by organometallic complexes, with applications in modern synthesis.

PREREQUISITES: CHEM 4101.03, or CHEM 4102.03, or CHEM 4120.03 or permission of the instructor

FORMATS: Lecture

### **CHEM 6155 Advanced Main Group Chemistry**

CREDIT HOURS: 1.5

Fundamentals aspects of molecular structure and covalent bonding models will be used to rationalize the diverse structures observed in a section of the chemistry of the p block elements. Representative examples of compounds will be selected from current literature for case studies.

PREREQUISITES: CHEM 4101.03, or CHEM 4102.03, or CHEM 4120.03 or permission of the instructor

### **CHEM 6252 Bioanalytical Chemistry**

CREDIT HOURS: 1.5

This course offers a thorough treatment of modern instrumental techniques for the analysis of biomolecules. Classical techniques used in biological analysis (Western blotting, DNA sequencing, Gene expression, PCR. etc.) are first reviewed. Modern instrumental techniques, including mass spectrometry, microarrays, and spectrometric measurements, are explored in the context of the current literature.

PREREQUISITES: CHEM 4206.03 or CHEM 5206.03 or permission of the instructor

FORMATS: Lecture | Discussion

### **CHEM 6253 Electrochemistry of Small Quantities**

CREDIT HOURS: 1.5

Cutting-edge and traditional electrochemical methods of identifying and quantifying analytes at very low concentrations will be explored. Topics include Electrochemical Impedance Spectroscopy, Electrochemical Quartz Crystal Microbalance, Scanning Electrochemical Microscopy, Anodic Stripping voltammetry and others. Applications such as biosensors and gas sensors will be discussed.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture

### **CHEM 6254 Electronics and Instrumentation for Chemists**

CREDIT HOURS: 1.5

This course is intended to introduce principles of electronics for those involved in making instrumental measurements in chemical applications. No prior knowledge of electronics is assumed. basic concepts related to signal transduction, measurement devices, passive and active circuit components and analog-to-digital conversion are discussed.

PREREQUISITES: permission of the instructor

FORMATS: Lecture | Lab

### **CHEM 6255 Computer Programming for Chemists**

CREDIT HOURS: 1.5

This course provides an introduction to computer programming using the MatLab programming environment. Topics include data structures, programming structures, flow control, specialized functions, input, and output, graphing and graphical user interfaces. Chemical applications will be emphasized.

PREREQUISITES: permission of the instructor

FORMATS: Lecture

### **CHEM 6256 Advanced Chemometrics**

CREDIT HOURS: 1.5

This course provides an opportunity to study topics in chemometrics not treated in the introductory core course. Specific topics examined will vary with the

background and interests of students enrolled, but could include signal processing, Fourier transforms, optimization, curve-fitting, factor analysis methods, multivariate curve resolution, and classification methods.

PREREQUISITES: CHEM 5205.03 or permission of the instructor

FORMATS: Lecture

### **CHEM 6258 Environmental Marine Chemistry**

CREDIT HOURS: 1.5

This course will focus on the role played by chemistry in determining the quality of the marine environment. The increasing needs to analyze chemicals covering a range of polarities and structures in seawater, sediments and organisms will be discussed along with the currently used approaches to judge the analytical results.

PREREQUISITES: CHEM 4206.03 or CHEM 4402.03 or CHEM 4201.03 or CHEM 4203.03, or permission of the instructor

FORMATS: Lecture | Seminar | Discussion

### **CHEM 6259 Analytical Chemistry of Toxic Organic Compounds in Food and Water**

CREDIT HOURS: 1.5

This course will review toxic natural and anthropogenic compounds of concern for our food and drinking water supplies. Regulatory action levels, analytical methods for routine monitoring, method validation, certified reference materials, quality control issues, and approaches to the forensic investigation of poisoning incidents will be discussed.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture

### **CHEM 6262 Analytical Separation of Proteins and Other Biomolecules**

CREDIT HOURS: 1.5

An overview of analytical technologies for separation of biological mixtures, with emphasis on protein fractionation. Both the fundamental theory as well as practical application of techniques will be covered. Specific techniques include reversed phase, ion exchange and affinity chromatography, gel, and capillary electrophoresis.

PREREQUISITES: Permission of instructor

FORMATS: Lecture | Discussion

### **CHEM 6263 Proteome Analysis**

CREDIT HOURS: 1.5

Proteomics describes the systematic characterization of proteins in order to understand a biological system. This relatively new field has progress through technology developments in bioanalytical chemistry, particularly involving separations and mass spectrometry. A thorough treatment of the motivation, methods and implications of proteomics is presented.

FORMATS: Lecture

### **CHEM 6351 Topics in Quantum Mechanics**

CREDIT HOURS: 1.5

Topics in quantum mechanics will be explored, with primary emphasis on angular momentum, group theoretical methods, and perturbation theory.

PREREQUISITES: Permission of instructor

FORMATS: Lecture

### **CHEM 6352 Advanced Electronic Structure Theory**

CREDIT HOURS: 1.5

The principles of Hartree-Fock theory are introduced and then used as a basis for understanding methods that include the effects of electron correlation. The emphasis is on configuration interaction and perturbation theory and the accurate calculation of a range of chemical properties.

PREREQUISITES: CHEM 5301.03 or permission of instructor

FORMATS: Lecture

### **CHEM 6353 Density-Functional Theory**

CREDIT HOURS: 1.5

The fundamental principles of density-functional theory (DFT) will be developed from density matrix theory through the Hohenberg-Kohn-Sham theorems, and the construction of modern exchange-correlation functionals via the exchange-correlation "hole" concept.

PREREQUISITES: CHEM 4301.03 or CHEM 5301.03 or permission of instructor

FORMATS: Lecture

### **CHEM 6354 Topics in Nuclear Magnetic Resonance**

CREDIT HOURS: 1.5

Advanced topics in nuclear magnetic resonance will be explored, including theories of the observable interactions, development of pulse sequences, and relaxation theory. Emphasis will be on solid materials.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture

### **CHEM 6355 Physical Properties of Materials**

CREDIT HOURS: 1.5

This course will provide an in-depth coverage of matters concerning lattice dynamics and related phonic properties of solids. In addition, categories of materials and techniques to determine their physical properties will be investigated.

PREREQUISITES: CHEM 3303.03 or CHEM 3305.03 or permission of the instructor

### **CHEM 6356 Advanced Materials Science**

CREDIT HOURS: 1.5

This course will explore advanced topics in materials science.

PREREQUISITES: CHEM 5303.03 or permission of the instructor

FORMATS: Seminar | Discussion

### **CHEM 6357 Advanced Cyclic Voltammetry Analysis**

CREDIT HOURS: 1.5

This course will take an in-depth approach to the analysis of cyclic voltammograms. Students will develop expertise on relating the shape of a cyclic voltammogram to important physical and kinetic information, including identifying: film formation, film type, diffusion, resistance, capacitance, specific adsorption, irreversible vs. reversible reactions, etc.

PREREQUISITES: permission of the instructor

FORMATS: Lecture

### **CHEM 6359 Biomedical Applications of Nanostructured Materials**

CREDIT HOURS: 1.5

This course introduces the applications of nanostructured chemical materials such as nanoparticle, nanofilm, nanowire and nanotube in a few exciting areas including bio- diagnosis, drug delivery and tissue engineering. The chemical synthesis and typical characterization techniques of nanostructured materials are also introduced.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture

### **CHEM 6360 Chemical Kinetics and Catalysis**

CREDIT HOURS: 1.5

This course will present our current understanding of the factors that affect the rates of chemical reactions. Students will take the results of quantum chemical calculations of potential energy surfaces and will use these to calculate the rates of elementary processes. Rates for elementary processes will be combined to predict the rates for processes proceeding by composite mechanisms. Emphasis will be on methods that can be applied to practical situations.

PREREQUISITES: permission of the instructor

FORMATS: Lecture

### **CHEM 6361 Sustainable Materials Issues**

CREDIT HOURS: 1.5

This course will provide a quantitative coverage of matters concerning eco-informed choices of materials for applications, with an emphasis on energy and sustainability.

PREREQUISITES: CHEM 3303.03 or CHEM 3305.03 or CHEM 5303.03 or PHYC 4230.03 or MATL 3500.03 or permission of the instructor

FORMATS: Lecture

### **CHEM 6362 Topics in High Resolution Nuclear Magnetic Resonance**

CREDIT HOURS: 1.5

Advanced topics in high resolution liquid state nuclear magnetic resonance will be explored, including the quantum mechanical basis of the observables, product operator treatment of pulse sequences, 2D NMR pulse sequences, coherence selection and relaxation.

PREREQUISITES: CHEM 4402.03/CHEM 5402.03, CHEM 4602.03/CHEM 5602.03, or permission of instructor

CROSSLISTED: BIOC 6702.015

FORMATS: Lecture

### **CHEM 6363 Electronic Structure Theory of Solids**

CREDIT HOURS: 1.5

Electronic structure of solids, with emphasis on density functional theory. the pseudopotential approximation will be emphasized, together with computation of properties such as phonons and elasticity.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture

### **CHEM 6364 Synchrotron X-ray Spec. I**

CREDIT HOURS: 1.5

This course will deal with the practical aspects of X-ray spectroscopy. It will present the experimental techniques used in modern synchrotron X-ray spectroscopy research, and it will include practice with data processing and fitting, simulation, and calculation of X-ray absorption spectra.

PREREQUISITES: CHEM 6362 or permission of the instructor

EXCLUSIONS: CHEM 6358.015

FORMATS: Lecture

### **CHEM 6365 Synchrotron X-ray Spec. II**

CREDIT HOURS: 1.5

This course will deal with the practical aspects of X-ray spectroscopy. It will present the experimental techniques used in modern synchrotron X-ray spectroscopy research, and it will include practice with data processing and fitting, simulation, and calculation of X-ray absorption spectra.

PREREQUISITES: CHEM 6362 or permission of the instructor

EXCLUSIONS: CHEM 6358.015

FORMATS: Lecture

### **CHEM 6451 Total Synthesis of Complex Organic Molecules**

CREDIT HOURS: 1.5

This course will examine some landmark total syntheses of complex natural products. The course will compare strategies of certain classes of target molecules, and students will become familiar with recently developed synthetic reactions.

PREREQUISITES: CHEM 4401 or CHEM 5401 or permission from the instructor

FORMATS: Lecture | Discussion

### **CHEM 6452 Heterocyclic Chemistry**

CREDIT HOURS: 1.5

This course will survey heterocyclic chemistry. The driving force of aromaticity will be investigated. Literature examples involving nitrogen-containing heterocycles will be used to emphasize the breadth and scope of the field. Students will be required to complete a project and a presentation.

PREREQUISITES: CHEM 4401, or permission of the instructor

FORMATS: Lecture | Seminar | Discussion

### **CHEM 6453 Natural Products**

CREDIT HOURS: 1.5

This course introduces the major groups of natural products, such as alkaloids, polyketides, and terpenes. Strategies, techniques, and structural/mechanistic reasoning used to elucidate biosynthetic pathways of natural products are presented before biosynthetic studies from current scientific literature are discussed. Examples include the biosynthesis of commercially important natural product pharmaceuticals.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture | Seminar

### **CHEM 6454 Advanced Physical Organic Chemistry**

CREDIT HOURS: 1.5

The fundamentals of advanced physical organic chemistry are covered.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture | Seminar

### **CHEM 6455 Advanced Organic Photochemistry**

CREDIT HOURS: 1.5

The fundamentals of advanced organic photochemistry are covered.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture | Seminar

### **CHEM 6456 Organic Reactive Intermediates**

CREDIT HOURS: 1.5

The fundamentals of reactive intermediates found in organic chemistry are covered. A wide range of reactive intermediates will be investigated including, carbonations, radicals, enols, and others.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture | Seminar

### **CHEM 6457 Magnetic Resonance Techniques for Drug Design and Development**

CREDIT HOURS: 1.5

Magnetic resonance techniques such as NMR spectroscopy and magnetic resonance imaging (MRI) have become essential tools for the design and molecular characterization of drugs and therapeutics. We will cover current topics of interest including structural characterization of drugs, receptors and binding motifs, and MRI techniques for drug monitoring.

PREREQUISITES: CHEM 4601 or CHEM 5601, or CHEM 4602 or CHEM 5602, or permission of the instructor

CROSSLISTED: BIOC 6703.015

FORMATS: Seminar | Discussion

### **CHEM 6458 Mechanistic and Structural Enzymology**

CREDIT HOURS: 1.5

Enzymes from a variety of classes will be examined from an organic chemistry reaction mechanism perspective. The general principles of enzyme catalysis and the experimental approaches used to elucidate enzyme reaction mechanisms will be discussed. Applications and examples from the current literature will be critically appraised.

PREREQUISITES: CHEM 3401/3601 or BIOC 3200 or instructor's consent

CROSSLISTED: BIOC 6701.015

FORMATS: Lecture | Discussion

### **CHEM 6459 Fundamentals of Carbohydrate Chemistry**

CREDIT HOURS: 1.5

The course will start with descriptions of the structures and conformations of monosaccharides and oligosaccharides. It will then describe the methods important for the synthesis of biologically important monosaccharides and oligosaccharides, including stereoselective methods for glycoside formation and protecting group strategies.

PREREQUISITES: CHEM 4401 or permission from the instructor

FORMATS: Lecture



**CHEM 6509 Graduate Student Seminar II**

CREDIT HOURS: 0

All graduate students enrolled in the Doctoral program will be required to present a graduate student seminar on their research topic during the final two years of study. Seminar II will normally be presented in the fall term of the fourth year of study. Graduate Student Seminar II has the purpose of giving the senior PhD student an opportunity to present a Departmental seminar on their research work. Evaluation will be based on preparation, presentation skills, scientific content, ability to field questions and regular attendance. Graded pass/fail

**CHEM 8891 Co-op Work Term I**

CREDIT HOURS: 0

**CHEM 8892 Co-op Work Term II**

CREDIT HOURS: 0

**CHEM 8893 Co-op Work Term III**

CREDIT HOURS: 0

**CHEM 8894 Co-op Work Term IV**

CREDIT HOURS: 0

**CHEM 8895 Co-op Work Term V**

CREDIT HOURS: 0

**CHEM 9000 MSC Thesis**

CREDIT HOURS: 0

**CHEM 9530 PhD Thesis**

CREDIT HOURS: 0

## Civil and Resource Engineering

Location:

“D” Building  
5268 DaCosta Row  
Room D215  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3960

# Introduction

## Programs

- Civil Engineering
- Mineral Resource Engineering

### Civil Engineering

Civil Engineering is concerned with the engineering (planning, design, and construction) of systems of constructed facilities to meet the needs of society. The scope and complexity as well as the interdisciplinary engagement of Civil Engineering continues to increase rapidly with the development of modern science and technology and population growth with its spiraling demands upon the air-land-water environment. The preparation of the Civil Engineering student is aimed toward meeting these challenges through innovative application of known principles, creative research to discover new approaches, and imaginative design to fulfill society's needs.

Civil Engineering graduates are found in responsible engineering and administrative positions in industry and government. Some become consultants in planning, design, or construction of engineering projects or in specialized fields where the application of research to the solution of practical problems is important. The professional practice of a Civil Engineer includes the conception, design, construction, operation, and maintenance of private and public projects. Included in this are bridges, buildings, highways, airports, railroads, harbors, docks, subways, tunnels, water supply and purification systems, sewage collection and treatment facilities, and hydropower developments. See the Engineering section for details of Master's and Doctoral programs.

### Mineral Resource Engineering

Canada has an abundance of natural resources and is a world leader in mineral and hydrocarbon extraction and processing. Mineral Resource Engineering concentrates on the technical, environmental, and economic aspects of the extraction and processing of the earth's mineral resources. Graduate Studies in Mineral Resource Engineering allow for specializations in mining and mineral processing.

#### *Specialization in mining and mineral processing engineering*

If a student chooses to specialize in mining engineering, opportunities exist for advanced studies in underground and surface mining of coal, oil shales, metals, gold, and industrial minerals. Research topics may include rock mechanics, mine design, ground support, field monitoring, optimization, equipment maintenance and many more. A student may also choose to specialize in mineral processing with the focus on the beneficiation of ores.

In addition to the Graduate Scholarships available in the Faculty of Engineering and Dalhousie University, the Mineral Resource Engineering Program also provides a limited number of Research Assistantships to highly qualified candidates. Candidates are suggested to contact individual faculty members for details.

# General Information

## Admissions Criteria

All candidates must meet the admission requirements of the Faculty of Graduate Studies, and any specific admission requirements as listed under each program.

## Application Forms

Application forms may be obtained from the Registrar's Office, Dalhousie University, PO Box 15000, Halifax, NS B3H 4R2, or through the university's website. Prospective students are encouraged to contact the Graduate Admissions Officer for program specific information.

## English Language Proficiency Requirement

Information pertaining to the English language proficiency requirement is given in the Faculty of Graduate Studies Regulations Section 3.4.

**Fees**

Information pertaining to fees and expenses can be found online in the Admission section of the Dalhousie website.

**Financial Assistance**

Information pertaining to financial assistance and scholarships can be found online in the Funding Opportunity section of the Dalhousie Faculty of Graduate Studies Website.

**Health Insurance Requirement**

Information pertaining to health insurance requirements is given in the Resources and Services section of the Dalhousie Graduate Calendar

**Graduate Student Program**

The graduate student's program, including supervisory committee composition, will be entered in the Graduate Student Information System (GSIS) by the department and approved by the supervisor, the graduate coordinator and FGS. The details of the program should be submitted in the first month after initial registration. The composition of the supervisory committee should be entered by the end of the second term.

**Course Requirement**

At least three-quarters (75%) of the total course requirement for each graduate program must be taken at Dalhousie University.

**Leave of Absence**

Students may formally apply for a leave of absence in accordance with the Faculty of Graduate Studies Regulations, Section 5.8.

**Master's Degrees**

A student's program of study for the master's degree may be either a research-intensive program (MASc) or a coursework-intensive program (MEng). Note that a thesis-based research master's degree is normally required to gain admission into the PhD program.

**Master of Applied Science (MASc)****Admissions Requirements**

A candidate to be considered for the Master of Applied Science research program must have obtained, with a high scholastic standing, an undergraduate degree in engineering or a degree in science with honours, or the equivalent, from a recognized university.

Candidates must also be recommended for admission by a faculty member in the Program for their application to proceed. Please note: a recommendation for admission is not a formal acceptance.

Candidates for the above degree may be required to take additional undergraduate subjects as a preparation for advanced courses or to give the candidate a suitable engineering background. Such subjects are seldom considered as part of the graduate program.

**Academic Regulations****Program Requirements**

A MASc graduate program consists of not less than 12 credit hours, the graduate seminar and thesis selected upon the advice of the thesis supervisor. Not more than one senior level undergraduate course may be taken as part of the 12-credit hour requirement.

**Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least one seminar presentation.

**Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the thesis supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

**Examination Requirement**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All master's degree candidates must pass all graduate level courses, and any approved undergraduate course, with a grade of at least B-. Graduate students can only repeat one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case by case basis.

All master's degree candidates must also pass an oral examination of their thesis after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum grade as noted above shall be considered grounds for dismissal.

### **Time Requirement**

A student is required to register each term to maintain eligibility to continue their program of studies. See Faculty of Graduate Studies Regulations for policies regarding residency requirements and the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for Master's Thesis**

The thesis is to be prepared to conform with the standards of the Faculty of Graduate Studies.

To initiate the thesis defence, the form "Appointment for an Oral Examination & Thesis Submission Form – Master's Programs" must be submitted to the departmental Office at least 10 business days prior to the date of the oral defence. The department will coordinate the scheduling of the presentation and examination and assign a chair/moderator. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:

- i) Course work completed;
- ii) Seminar completed;
- iii) Supervisory committee approved.

### **Master of Engineering (MEng)**

#### **Admission Requirements**

A candidate to be considered for the Master of Engineering course work program must have obtained an undergraduate degree in engineering or its equivalent with high scholastic standing from a recognized university.

Candidates must also be accepted by a faculty member in the Program they are seeking admission to be considered for admission in this program by the University. Please note: a recommendation for admission is not a formal acceptance.

#### **Academic Requirements**

##### **Program Requirements**

A MEng graduate program consist of not less than 21 credit hours, the graduate seminar and the six-credit hour project. Undergraduate courses, in the area of a student's interest, not taken by the student for previous credit, may be included in the program, subject to prior approval. Not more than 6 credit hours may be undergraduate credit hours.

A project is required as a part of the program (six credit hours out of the required 27 credit hours). Projects require the appointment of a supervisor and one supervisory committee member.

##### **Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least one seminar presentation.

##### **Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the project supervisor (and co-supervisor) and at least one other member with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

##### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses, and any approved undergraduate courses, with a grade of at least B-. Graduate students can only repeat one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

All MEng degree candidates must also pass an oral examination of their project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### **Time Requirement**

A student is required to register each term to maintain eligibility to continue their program of studies. See Faculty of Graduate Studies Regulations for policies regarding residency requirements and the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for Master's Projects**

The project report is to be prepared to conform with the standards of the Faculty of Graduate Studies.

To initiate the project defence, the form "Appointment for an Oral Examination & Thesis Submission Form – Master's Programs" must be submitted to the departmental Office at least 10 business days prior to the date of the oral defence. The department will coordinate the scheduling of the presentation and examination. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:

- i) Course work completed;
- ii) Seminar completed;
- iii) Supervisory committee approved.

### **Doctor of Philosophy (PhD)**

#### **Admission Requirements and Procedures**

A candidate to be considered for entrance into the PhD Program must meet the admission requirements of the Faculty of Graduate Studies and must also have a research master's degree in engineering from Dalhousie University or another recognized university; or a Master of Science Degree or its equivalent from a recognized university, acceptable to the Faculty of Engineering (in which case, a candidate may be required to take extra subjects to provide a suitable engineering background); or acceptance for registration as a candidate for a research master's degree at this University.

An application for admission to the graduate program leading to the degree of Doctor of Philosophy should have a superior academic record and previous training or experience which indicates that the candidate should be able to do independent research.

Candidates must also be recommended for admission by a faculty member in the Program for their application to proceed. Please note: a recommendation for admission is not a formal acceptance.

Doctoral candidates are not admitted without appropriate funding to support the student and the program of research.

#### **Admission from Master's Degree**

A candidate registered in a MASc Degree in the department may be transferred to a PhD Degree on the recommendation of their supervisory committee, according to the regulations of the Faculty of Engineering. The recommendation will be reviewed by the Faculty of Engineering Graduate Studies Committee (GSC) and transmitted to the Faculty of Graduate Studies.

#### **Academic Regulations**

All doctoral programs are developed under the regulations and procedures of the Faculty of Graduate Studies (see Faculty of Graduate Studies Regulations), and each program must be approved by the Faculty of Engineering and the Faculty of Graduate Studies.

#### **Program Requirements**

A PhD graduate program consists of a minimum of 12 credit hours, the graduate seminar, comprehensive examination, and thesis selected upon the advice of the thesis supervisor. No undergraduate courses are allowed for credit in a Doctoral Degree Program.

Granting of credits to a student's program of studies for courses taken prior to commencement of the program requires the recommendation of the Department and approval of the Faculty of Engineering Graduate Studies Committee. A request for this transfer of credit must be made to the Department before the student's first registration or in the first term.

### **Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least two seminar presentations.

### **Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the thesis/project supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

### **Thesis Subject Matter and Supervision**

The thesis shall consist of an original investigation or design carried out under the immediate supervision of a member of the Faculty of Engineering who is also a member of the Faculty of Graduate Studies.

### **Thesis Requirement**

A candidate will be required, as a major part of the program, to submit a satisfactory thesis embodying the results of original scholarship and independent research. See Faculty of Graduate Studies Regulations for information pertaining to doctoral theses.

### **Examination Requirements**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

A PhD degree candidate must pass all graduate level courses with a grade of at least B- and cannot carry a course failure. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

PhD candidates are also required to pass a comprehensive examination which normally takes place within the fourth study term.

As well, all PhD degree candidates must pass an oral examination of their thesis project after it has been submitted in satisfactory form, and in accordance with the Faculty of Graduate Studies Regulations.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### **Comprehensive Examination**

The Supervisory Committee shall be responsible for conducting the comprehensive examinations.

The purpose of the comprehensive examination is to ensure that the candidate has a thorough understanding of the chosen field of study as a whole, has attained knowledge to an adequate level in the discipline, and to evaluate their suitability to begin PhD-level thesis research.

The comprehensive examination consists of at least two written examinations and an oral examination conducted to meet the above objective. The comprehensive examination shall normally be started within the fourth session of study from first registration. A student shall be given at least three months' notice of the examination. The topics and results of the examination will be conveyed to PhD Candidate's home department's Graduate Coordinator on the prescribed form and will indicate "pass", "fail", or "re-examination". The results to be added to the student's transcript

Recommendation of the examining committee to re-examine shall only be permitted if the failure was marginal. Re-examination of marginal students must be carried out within six months of the initial examination. Students requiring re-examination shall not necessarily be required to rewrite both written examinations. Students given the opportunity to rewrite shall only be permitted to rewrite once.

Students receiving a recommendation of "fail" will be academically dismissed from the program (see FGS regulations about dismissal).

### **Time Requirement**

A student is required to register each term to maintain eligibility to continue their program of studies. See Faculty of Graduate Studies Regulations for policies regarding residency requirements and the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for PhD These Defences**

An Examining Committee is appointed in accordance with Faculty of Graduate Studies procedures prior to the formal submission of the thesis. The Examining Committee consists of the Supervisory Committee and an external examiner recommended to FGS by the Supervisory Committee. The External Examiner will be approached and appointed by the Faculty of Graduate Studies according to Faculty procedures.

A copy of the thesis must be submitted to the Faculty of Graduate Studies at least six weeks prior to the date of the oral defence. The copy will be sent to the External Examiner. The copy must be accompanied by the appropriate form. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:

- i) Course work completed;
- ii) The graduate seminar requirement completed;
- iii) Comprehensive examination passed;
- iv) Examining Committee established;
- v) A written report has been received by the Faculty of Graduate Studies from the external examiner.

## **Mineral Resource Engineering Program**

### **Introduction**

Please refer to the Civil and Resource Section of this calendar for information regarding Mineral Resource Engineering.

## **Staff**

### **Dean**

**Newhook, J.**, BEng, MSc (TUNS), PhD (Dalhousie), PEng

### **Department Head**

**Liu, Y.**, BScE, MScE (Xi'an), PhD (UNB), PEng

### **Graduate Studies Coordinator**

**Kurylyk, B.**, BSc, PhD (UNB), PEng

### **Professors**

**Ali, N. A.**, BSc (Baghdad), MSc, PhD (N Carolina State), PEng, UG Civil Program Coordinator. Flexible pavement, highways, pavement design and performance, transportation

**El Nagggar, H.**, MSc, PhD (UWO), PEng. Civil construction, geotechnical and structural engineering, design of foundations, soil-structure interaction of buried infrastructure

**Gagnon, G.**, BScE (Guelph), PhD (Waterloo), PEng, Associate Vice-President Research, Director, Centre for Water Resources Studies, cross-appointment with the School for Resource and Environmental Studies. Water and wastewater treatment, water quality, environmental engineering

**Garagash, D. I.**, BSc (Moscow), MS, PhD (Minnesota), PEng. Reservoir geomechanics and engineering, fault mechanics and earthquake source processes, analytical and numerical modeling, fracture mechanics

**Jamieson, R.**, BEng (TUNS), MSc (Dalhousie), PhD (Guelph), PEng, UG Environmental Program Coordinator. Hydrology, ecological engineering, contaminant transport

**Lake, C.**, BEng (TUNS), PhD (UWO), PEng. Geotechnical engineering, geo-environmental engineering, geosynthetics performance

**Liu, L.**, BSc (Nankai), MSc (Peking), PhD (Regina), PEng. Geo-Environmental engineering, environmental engineering, environmental modelling and decision-making

**Liu, Y.**, BSCE, MSCE (Xi'an), PhD (UNB), PEng, Department Head. Structural analysis and design, application to masonry structures, advanced strength of materials, application of the finite element method

**Newhook, J. P.**, BEng, MASC, PhD (TUNS), PEng, Dean, Faculty of Engineering. Fibre reinforced polymers, concrete, bridge engineering, structural health monitoring, design, analysis

**Satish, M. G.**, BSc, BECivEng (My), MEng, PhD (Concordia), PEng. Water resources engineering, numerical modeling of flows, system optimization, open channel flow

**Walsh, M.**, BEng (TUNS), MEng (McGill), PhD (Dalhousie), PEng. Water and wastewater treatment

**Zou, D. H.**, BSc (CUMT, China), PhD (UBC), PEng. Rock mechanics, non-destructive rock bolt testing, mine design, numerical modelling, tailing disposal, slope stability analysis, well bore stability, geohazards prevention

## Associate Professors

**Corkum, A.**, BEng (TUNS), MEng, PhD (Alberta), PEng, UG Mineral Resource Program Coordinator. Geotechnical engineering, rock mechanics, excavations and rock slopes, safe and economical design of tunneling and underground excavations and rock slopes

**Hansen, D.**, BScE (Guelph), MScE (UNB), PhD (Ottawa), PEng, UG Co-op Advisor. Hydrology, river hydraulics, flow through porous media, municipal water systems

**Sadeghian, P.**, BSc, MSc (Sharif), PhD (Amirkabir), PEng. Fiber-reinforced polymer (FRP) composites, mechanics of materials, concrete structures, and structural dynamics

## Assistant Professors

**Bahrani N.**, BSc, (Azad), MSc (Alberta), PhD (Laurentian), PEng. Mining geomechanics, underground excavation, support design, rock slope stability, numerical modeling

**Kurylyk, B.**, BSc, PhD (UNB), PEng, Graduate Coordinator. Coastal and marine hydrogeology, groundwater-surface water exchanges, cold regions hydrology, mathematical modeling, climate change impacts

**Oudah, F.**, BSc, (Sharjah), MSc, PhD (UC), PEng. Development of smart structural systems, reliability-based procedures for structural assessment and design optimization, behaviour and design of earthquake resistant structures

**Somers, L.**, BSc Eng (UNB), PhD (McGill). Hydrology, hydrogeology, mountain water supply, wetlands, greenhouse gas emissions, climate change impacts and adaptation

**Stoddart, A.**, BEng, PhD (Dalhousie), PEng. Water Quality and Treatment

**Tousignant, K.**, BASc, PhD (UT), PEng. Steel structures, connections, welding, components, fracture modeling

## Cross-Appointed Faculty

**Fenton, G.A.**, (From Engineering Mathematics) BEng, MEng (Carleton), MA, PhD (Princeton), PEng

**Habib, M. A.**, (From the School of Planning) BURP, MURP, (BUET), MASC, PhD (Toronto)

**Price, G.**, (From Faculty of Agriculture) BSc (UBC), MSc, PhD (Guelph)

**Taheri, F.**, (From the Department of Mechanical Engineering) BEng, MASC, PhD (TUNS), PEng

## Adjunct (FGS)

**Brazner, J.**, BSc, PhD (Wisconsin-Madison), MSc (Syracuse)

**Craig, S.**, BSc (Hons), PhD (Strathclyde)

**Drage, J.**, MSc (UNB), BSc (Dalhousie)

**Fam, A. Z.**, BSc (Alexandria), MSc, PhD (Manitoba), PEng

**Kennedy, G.**, BSc (McMaster), MSc (Waterloo)

**Ketcheson, S.**, BSc (McMaster), MSc, PhD (Waterloo)

**Kurek, J.**, BSc (SUNY), MSc, PhD (UNB)

**Mackie, A.**, BSc MASC, PhD (Dalhousie)

**Rand, J.**, CAS (Acadia), BEng, PhD (Dalhousie)

**Spooner, I.**, BSc, MASC (Queens), PhD (U of Calgary)

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.



# Course Notes

See the Engineering section of this calendar for Master's and Doctoral program details. Courses listed under PETR-petroleum engineering may also be accepted for credit toward graduate studies in Mineral Resource Engineering.

## Course Descriptions - Civil Engineering

### **CIVL 5541 Application of Finite Element Method in Static & Dynamic Systems**

CREDIT HOURS: 3

This course presents an introduction to the theory and application of the finite element method. The basic linear elasticity, Principles of Minimum work and energy methods will be used in developing the methodology. Students will gain practical experience, using a commercial software package, to treat a balance set of real-life two and three-dimensional stress deformation problem under static and dynamic loading systems that are of specific interest to structural engineers. Graduate students will be expected to complete an assigned term project; they would also be given different questions in course's final exam.

PREREQUISITES: CIVL 3705.03, CIVL 3505.03, CIVL 3740.03 (or equivalents)

CROSSLISTED: CIVL 4541.03

FORMATS: Lecture | Lab

### **CIVL 6000 Directed Studies in Civil Engineering I**

CREDIT HOURS: 3

This course offers the Graduate Student an opportunity to undertake a study in a specific area of interest that is not covered in the regular course offerings. The student chooses to work under the supervision of a Faculty Member in the Department. This course is normally available to a Graduate Student enrolled in a Master's Degree Program.

### **CIVL 6101 Advanced Strength of Materials**

CREDIT HOURS: 3

The course introduces tensor mathematics. The governing equations of an elastic solid are developed in various coordinate systems. Engineering problems such as plane problem, St. Venant, bending, torsion, and extension of bars are treated. Displacement, stress field and Airy function and some numerical methods for obtaining solutions are other methods that are covered. The course explores various failure criteria and their application. Theory of anisotropic elastic continuum concludes the course.

PREREQUISITES: Undergraduate senior level Strength of Materials or equivalent

### **CIVL 6102 Tubular Steel Structures**

CREDIT HOURS: 3

This course covers contemporary design of steel structures with an emphasis on tubular structures made from manufactured hollow structural sections (HSS). Specific topics deal with manufacturing methods, material properties, hollow and concrete-filled member design, stability, connections, plastic analysis, fabrication, inspection, and fatigue.

### **CIVL 6103 Coastal Water Resources**

CREDIT HOURS: 3

This course addresses hydrologic, hydrogeologic, and hydraulic processes and engineering challenges in coastal zones. A general introduction to coastal zone dynamics (waves, tides, over-topping, and sea-level rise) is followed by a rigorous discussion of the physics governing water exchange in surface (hydrology), subsurface (hydrogeology), and open-channel (hydraulics) environments.

### **CIVL 6108 Graduate Seminar - Master's Level**

CREDIT HOURS: 3

This seminar course is designed to provide graduate students with the opportunity to search the literature for information on current topics related to their projects/thesis. All graduate students pursuing MEng and MASc degrees in the Civil Engineering program are required to take this course and offer their findings, orally in *one* presentation to the faculty members of the department and students, four months prior to the completion of their program. This presentation will be followed by a question-and-answer session. Graduate students might also be asked to submit a written version of their presentations (or a hard copy of their presentation slides) to the Graduate Coordinator of their department. This seminar course will be offered twice each academic year in the format of an end-of-term conference in Fall and Winter semesters, respectively. Evaluation will be based on preparation, presentation skills, scientific content, ability to field questions and regular attendance. Graded pass/fail.

CALENDAR NOTES: This is a required course for all Master students in the Department of Civil and Resource Engineering;(2)Registration of this course is required for the Fall and Winter terms only.

### **CIVL 6115 Design of Water Treatment Plants**

CREDIT HOURS: 3

Evaluation of water quality characteristics and synthesis of unit operations into plants designed to modify those characteristics. Design aspects of flocculation, coagulation, precipitation, sedimentation, filtration, and disinfection are included.

PREREQUISITES: CIVL 4440.03 or equivalent

### **CIVL 6116 Biological Waste Treatment**

CREDIT HOURS: 3

A study of fundamental principles of microbiology as applicable to domestic waste treatment. Activated sludge processes, trickling filters, aerated lagoon, stabilization ponds, disinfection, and anaerobic treatment.

PREREQUISITES: CIVL 4440.03 or equivalent

### **CIVL 6117 Water Quality Management**

CREDIT HOURS: 3

Water quality requirements for various uses: factors affecting water quality; behaviors and fate of pollutants in treatment plants and receiving waters and considerations involved in selection from alternative methods of water quality control.

### **CIVL 6118 Advanced Wastewater Treatment**

CREDIT HOURS: 3

Theory and application of treatment processes for municipal and industrial wastewater. Course is delivered in three modules to cover physical and chemical treatment processes, microbial.

CALENDAR NOTES: Course for water and wastewater students in MASc; MENG; PhD programs

PREREQUISITES: Undergraduate course in water and wastewater treatment or equivalent

FORMATS: Lecture | Lab

### **CIVL 6119 Highway Materials**

CREDIT HOURS: 3

A study is made of the properties of subgrades and of how they influence the performance of pavements. The purpose and properties of base and sub-base will be considered. Bituminous materials and aggregates are tested and combined to give desirable mixes.

### **CIVL 6126 Foundation Engineering I**

CREDIT HOURS: 3

Geotechnical aspects of shallow and deep foundation design are presented. Current subsoil investigation and field methods for foundations of structures will be reviewed. Bearing capacity and deformation of both shallow and deep foundations are examined with respect to analytical, numerical and empirical methods.

### **CIVL 6128 Environmental Geo-Technique**

CREDIT HOURS: 3

This course will focus on the influence of environmental loadings on a soil's engineering behavior. Students will be introduced to soil mineralogy, and methods for determining a soil's mineralogical and chemical composition are introduced. Engineering applications of course contents will be introduced through self-directed learning.

PREREQUISITES: CIVL 3101.03 or equivalent

FORMATS: Lecture

### **CIVL 6129 Near Surface Rock Engineering**

CREDIT HOURS: 3

This course deals with the application of rock mechanics principles to rock engineering projects in Civil Engineering. A brief review of rock mechanics and engineering geology principles will be provided. These principles will be applied to design topics such as: rock foundations/anchors; grouting; and slope stability. In situ testing and instrumentation, and computer analysis in rock engineering will be covered. Case studies will be emphasized in the course.

FORMATS: Lecture | Tutorial

### **CIVL 6130 Geotechnical Earthquake Engineering**

CREDIT HOURS: 3

The purpose of this course is to provide the student with a basic knowledge and understanding of geotechnical earthquake engineering concepts. The course will cover geologic understanding of earthquakes, ground motion, soil and site effects, characterization of ground motion, and laboratory and field measurement of dynamic soil properties.

PREREQUISITES: CIVL 4111.03 or equivalent

FORMATS: Lecture

### **CIVL 6134 Advanced Highway Geometric Design**

CREDIT HOURS: 3

This course deals with the principles of Geometric design controls and criteria with special reference to capacity-controlled designs. Grade separated intersections and fully developed interchanges will be discussed in relation to traffic volumes. Computer-based design of freeway and ramp junctions will be considered in detail.

### **CIVL 6135 Groundwater Chemical Quality**

CREDIT HOURS: 3

This course provides an in-depth study into the chemical quality of groundwater. As water passes through the various stages of the hydrologic cycle, its composition changes. This course will explore these changes with particular reference to: (1) the types of inorganic and organic constituents dissolved in water and their significance; (2) the suitability of water quality data and its presentation; (3) the various processes that control the behaviour of dissolved substances in groundwater; (4) the evolution of groundwater quality; (5) the more commonly used groundwater quality models; (6) basic chemical properties, transport mechanisms, retardation and restoration of organic contaminants in water; and (7) point of use water treatment.

PREREQUISITES: CIVL 3451.03 and 4410.03. The latter may be taken concurrently.

### **CIVL 6137 Advanced Soil Mechanics**

CREDIT HOURS: 3

This course deals with the stress-strain behaviour and its mathematical representation. The aspects considered include nonlinear elastic and elasto-plastic behaviour of soils with particular reference to the critical state theory. Application of several well-established soil models for solving practical problems are discussed.

### **CIVL 6139 Transport Operations**

CREDIT HOURS: 3

This course is an introduction to the operation of transportation services at the urban and regional levels. Surveys and data collection, development of computerized data bases, and elements of travel forecasting; trip generation, trip distribution, modal split, trip assignment are covered. Operational characteristics of public transportation, airports and freight distribution systems, and performance evaluation are discussed. Environmental, energy and safety implications of transportation systems, and existing policies are reviewed.

### **CIVL 6141 Modeling of Groundwater Systems**

CREDIT HOURS: 3

Basic concepts in analytical and numerical modeling of groundwater systems are introduced. Fundamental equations for flow in aquifers and mathematical statement of the groundwater forecasting problems are studied. The hydraulic approach to flow in aquifers and the continuum approach to flow through porous media are discussed. Modeling techniques for groundwater quality problems dealing with pollutant movement due to hydrodynamic dispersion are also studied.

PREREQUISITES: CIVL 4410.03

### **CIVL 6142 Pavement Design and Management**

CREDIT HOURS: 3

This course covers all aspects of flexible, (asphalt concrete) and rigid (Portland cement concrete) pavements design methods. It includes structural pavement design of new pavements and overlay, including mechanistic. (i.e., shell, Asphalt Institute, PCA), empirical, (i.e., AASHTO, Ontario) and performance prediction - oriented, (i.e., VESYS, DAMA, LTPP - observation) methods. It also includes the recent research efforts in monitoring pavement performance.

### **CIVL 6143 Modelling of Groundwater Systems II**

CREDIT HOURS: 3

This course builds on the fundamental concepts introduced in Modelling of Groundwater I. Emphasis will be placed on numerical techniques for studying contaminant transport in groundwater. Numerical aspects of modelling, parameter identification and optimization will be discussed along with modelling of chemistry coupled to transport, dispersion theory and transport in fractured media.

PREREQUISITES: CIVL 6141.03

### **CIVL 6144 Geo-Environmental Barrier Design**

CREDIT HOURS: 3

Geo-environmental aspects of waste management are examined with emphasis on the design of barrier systems to provide long term protection against groundwater contamination. A major focus is the integration of engineering design and hydrogeologic considerations relative to contaminant transport through engineered barrier systems and natural soils.

EXCLUSIONS: CIVL 4460

### **CIVL 6145 Probability Concepts in Civil Engineering Planning & Design**

CREDIT HOURS: 3

This course introduces concepts related to the role of probability in civil engineering, uncertainty in real-world information, design and decision making under uncertainty.

Examples will be derived from planning and design of airport pavements, hydrologic design, of structures and machines, geotechnical design, construction planning and management, photogrammetric and geodetic surveying measurements. The course will discuss analytical models of random phenomena, functions of random variables, estimating parameters from observation data, empirical determination of distribution models, regression and correlation analyses, elements of quality assurance and acceptance sampling.

### **CIVL 6147 Advanced Theory of Structures**

CREDIT HOURS: 3

This course provides graduate students and practicing engineers with a knowledge necessary to make safe and efficient use of computer programs designed to analyze frame type structures. The displacement method is studied in detail with applications to trusses, continuous beams, complex rigid frames, grillages, and space frames. The theoretical knowledge gained is put into practice through commercially available codes. Throughout the course, practical 'real-life' problems constitute the assignments and projects.

PREREQUISITES: CIVL 3505.03 or equivalent

### **CIVL 6148 Application of Finite Element Method I (Linear Systems)**

CREDIT HOURS: 3

This course introduces the theory and implementation of the analysis procedures used in the linear, static, and dynamic finite element analysis systems. Continuum mechanics formulations of one-two- and three-dimensional elements are reviewed, and plate and shell elements formulations are presented in detail. A selected number of equation and eigenvalue solvers are compared. Applications will include plates and shells, linear buckling, structural dynamics, and thermal field problems. Introduction to nonlinear systems will be presented.

PREREQUISITES: CIVL 3705.03 and CIVL 4541.03

### **CIVL 6149 Application of Finite Element Method II (Nonlinear Systems)**

CREDIT HOURS: 3

This course introduces the theory and implementation of the analysis procedures used in geometric and material nonlinear finite element analysis systems. Problems in plasticity, impact, contact, and viscoelasticity are treated. Numerical solutions pertinent to nonlinear systems are explored. Various topics and algorithms such as the reduce integration, hourglass and Arc Length Automatic Stepping method are also reviewed. The students examine the above concepts by exploring a set of industrial applications.

PREREQUISITES: course in linear FE

**CIVL 6150 Dynamics of Structures**

CREDIT HOURS: 3

This course covers fundamental analysis methods for the behavior of structures and structural elements subjected to dynamic loading. Comprehensive study of single-degree-of-freedom systems followed by solution of multi-degree-of-freedom systems with particular reference to response of multi-story structures to earthquake loading is covered. An introduction to random response and stochastic analysis of structural dynamics problems are also given.

**CIVL 6151 Bridge Engineering**

CREDIT HOURS: 3

This course provides an introduction to bridge engineering, specifically discussing the aspects of loading, analysis, and design relevant to short and medium span bridges. Reference is made to current Canadian bridge design codes. Analytical methods appropriate for bridge superstructures is presented, including computer methods. The structural design of steel, reinforced concrete and prestressed concrete bridge systems are discussed.

**CIVL 6152 Behaviour and Design of Steel Structures**

CREDIT HOURS: 3

Advanced concepts of the behaviour and design of steel members and frameworks are presented, emphasizing the rationale for current steel code design criteria. Topics include torsion, plate stability, connection design, fatigue, and frame behaviour.

PREREQUISITES: CIVL 4541.03 or equivalent

**CIVL 6155 Advanced Concrete Technology**

CREDIT HOURS: 3

This course provides an in-depth study of the various factors affecting the behavior and performance of concrete. Strength of concrete, permeability and durability, deformation and cracking, curing, admixtures, temperature effects and specialized testing procedures are among the topics presented. High performance concrete, polymer concrete and roller compacted concrete are also studied.

**CIVL 6156 Fibre Reinforced Composites for Civil Engineering Infrastructure**

CREDIT HOURS: 3

The purpose of this course is to introduce the student to various fibre composites and to provide information on their constituent materials, fabrication, mechanical performance, and applications in Civil Engineering infrastructure. Interaction between fibres and matrix, behaviour under tensile, flexure, fatigue and impact loading, properties of fibre reinforced composites are studied. Special fibre reinforced composite systems like laminates, wraps, and rebars and different application procedures like structural rehabilitation and new constructions are also covered.

**CIVL 6157 Advanced Reinforced Concrete Structures**

CREDIT HOURS: 3

A study of principles of reinforced and prestressed concrete design and the application of prestressed concrete to buildings, bridges, and prefabricated structures. Yield line theory of concrete slabs, design of structures for earthquake loads, structural failure and methods of repair are covered.

PREREQUISITES: CIVL 3515.03, CIVL 4515.03

**CIVL 6159 Form and Process in Alluvial Channels**

CREDIT HOURS: 3

This course begins with various aspects of fluvial geomorphology from a civil engineering point-of-view. It then moves on to discussion of hydraulic resistance based on quantitative estimates of channel roughness, regime concepts for artificial and natural rivers, uses of boundary shear stress and unit stream power in bed-load estimations, the hydraulics, and statistics of suspended sediment, numerical versus physical modelling, and a review of case histories of responses of rivers to human activity. The hydraulics of fish habitat assessment is also considered. The application of HEC-RAS to a local brook is part of the course.

PREREQUISITES: CIVL 3300.03, CIVL 3310.03

**CIVL 6160 Energy Methods and Stability in Elastic Structures**

CREDIT HOURS: 3

Energy methods are an important tool in elastic structural analysis and design. Many traditional methods, as well as more advanced finite element analyses for determining displacements and stresses, are based on energy principles. This course will introduce energy methods and look at several applications in structural engineering, including determination of the elastic stability limits of structures and the development of displacement matrix methods of analysis.

### **CIVL 6162 Groundwater and Wells**

CREDIT HOURS: 3

This course deals with those aspects of groundwater resource assessment, development and protection pertaining to the design of water wells intended to function as reliable sources of potable water in the long-term. It includes detailed consideration of drilling methods, well design, aquifer testing, field-data interpretation, strategies for well-head protection, and the essentials of site assessment.

PREREQUISITES: CIVL 4410.03

### **CIVL 6163 Design and Analysis of Plates and Shells**

CREDIT HOURS: 3

This course deals with the derivation and the solution of the differential equations of plates and shells. The solutions are used for the design and analysis of practical problems. The topics covered are plates in Cartesian coordinate system with various boundary and load conditions, introduction of yield line theory, circular plates, plates on elastic foundation, membrane theory, cylindrical shells and the theory of shells having the form of a surface of revolution.

PREREQUISITES: CIVL 3705.03 or equivalent

### **CIVL 6166 Advanced Structural Engineering Concepts**

CREDIT HOURS: 3

The course will address selected advanced topics in structural engineering related to the characteristics of loading and the behaviour and design of structural systems. Ultimate strength, stability, connections, and post-buckling strength will be examined, focusing on elements employed in building and bridge structures.

FORMATS: Lecture

### **CIVL 6167 Microbes in Industrial Failures**

CREDIT HOURS: 3

The deterioration of materials by microorganisms is of great economic significance. It has been estimated that the biological deterioration of all industrial materials, is in the billions of dollars annually. This course is going to cover the microbial damage to building, oil and gas, wood, transportation, steel and mining industries.

FORMATS: Lecture | Lab

### **CIVL 6410 Engineering Hydrogeology**

CREDIT HOURS: 3

This quantitative overview of groundwater engineering covers fundamental hydrogeology topics, including saturated and unsaturated groundwater flow through porous media and fractured rock, groundwater flow equation solutions, well hydraulics and design, pumping test analysis, groundwater-surface water interactions, and subsurface contaminant transport and attenuation. Course content is addressed in the context of groundwater resources management.

FORMATS: Lecture | Lab | Tutorial

### **CIVL 6414 Environmental Systems Engineering**

CREDIT HOURS: 3

This course discusses various operational research techniques and their applications to environmental systems planning and pollution control. Case studies are designed to deal with the planning, design, and operation issues of environmental systems. Uncertainty-based optimization will be discussed for addressing systems' variability and for making decisions with improved cost-effectiveness and efficiency. Computer software packages will be used to enhance the learning experience of the course.

PREREQUISITES: Statistics and Engineering Mathematics or consent by the instructor.

FORMATS: Lecture | Lab

### **CIVL 7000 Directed Studies in Civil Engineering II**

CREDIT HOURS: 3

This course is designed for a Doctoral Candidate pursuing graduate studies leading to a PhD degree in Civil Engineering. It offers the graduate student an opportunity to complete an advanced study in a specific topic of interest that is not included in the regular courses offered. The student works under the supervision of a faculty member in the Civil Engineering Department.

### **CIVL 7105 Graduate Seminar - PhD Level**

CREDIT HOURS: 3

This seminar course is designed to provide graduate students with the opportunity to search the literature for information on current topics related to their project/thesis. All graduate students pursuing a PhD degree in the Civil Engineering Program are required to take this course and offer their findings, orally, in TWO presentations to the faculty members of the department and students, in two intervals, before their thesis defense. The presentation will be followed by a question-and-answer session. Graduate students might also be asked to submit a written version of their presentations (or a hard copy of their presentation slides) to the Graduate Coordinator of their department. This seminar course will be offered twice each academic year in the format of an end-of-term-conference in Fall and Winter semesters, respectively. Evaluation will be based on preparation, presentation skills, scientific content, ability to field questions and regular attendance. Graded pass/fail

CALENDAR NOTES: (1) This is a required course for all PhD students in the Department of Civil and Resource Engineering; (2)Registration of this course is required for the Fall and Winter Terms only.

### **CIVL 8891 Co-op Work-Term I**

CREDIT HOURS: 0

### **CIVL 8893 Co-op Work-Term III**

CREDIT HOURS: 0

### **CIVL 8894 Co-op Work-Term IV**

CREDIT HOURS: 0

### **CIVL 8900 Master of Engineering Project**

CREDIT HOURS: 6

This course gives students the opportunity to complete an in-depth project in an area of civil engineering under the supervision of a faculty member. The study may consist of an engineering project, a laboratory research project, a field project, a modeling project, an advanced design project, an analysis of research data, or some combination thereof. Students enrolled in the project must submit a report of their work to their supervisor and give an oral presentation to their committee (supervisor plus a minimum of one internal reader).

### **CIVL 9000 Masters Thesis**

CREDIT HOURS: 0

### **CIVL 9530 PhD Thesis**

CREDIT HOURS: 0

## **Course Descriptions - Mineral Resource Engineering**

### **MINE 6001 Advanced Rock Mechanics**

CREDIT HOURS: 3

This course deals with specific rock mechanics problems related to ground stability control in mines. Emphasis is placed on in situ stress measurement, stress change and ground movement monitoring, numerical modelling in mining applications, rock bursting and micro seismic monitoring. Theory, state-of-the-art and existing problems of relevant techniques are discussed. Case studies are included to solve practical problems.

PREREQUISITES: Knowledge of differential equations and linear algebra and MINE 3611.03 or equivalent.

### **MINE 6002 Mine Excavation**

CREDIT HOURS: 3

Advanced technology of excavation with particular emphasis on tunnelling. Analysis of continuous and cyclical excavation methods. Advanced ground support technology. Excavation equipment. Economic analysis. Studies of case histories of excavation projects.

### **MINE 6004 Analysis of Mineral Industries**

CREDIT HOURS: 3

Evaluation of mining properties and mineral processing industries. Supply of, and demand for, mineral raw materials, world distribution and trade in minerals, mineral in national/international affairs. Canadian mineral policy, conservation of mineral resources, substitutes, secondary recovery of mineral raw materials, business cycles in the mineral industries, financing of new mining projects and source of funds.

### **MINE 6006 Applied Numerical Modeling in Geomechanics**

CREDIT HOURS: 3

This course deals with the application of numerical modeling techniques in rock mechanics. A brief review of various numerical modeling methods will be provided first. Advanced topics in rock mechanics will then be discussed with the aid of industry standard numerical modeling programs. Case studies will be emphasized in the course.

FORMATS: Lecture

### **MINE 6007 Directed Studies in Mining Engineering**

CREDIT HOURS: 3

This course is available to graduate students enrolled in a Masters Program in Mineral Resource Engineering wishing to gain knowledge in a specific area for which no graduate level course is offered. Students are assigned an advisor and are required to present a formal report at the end of the course.

### **MINE 6008 Advanced Petroleum Engineering**

CREDIT HOURS: 3

The course is an advanced study of petroleum reservoir engineering, drilling, and development. The emphasis is on topics such as: analysis and prediction of oil and gas reservoir performance under a variety of production methods, theory, and practice of well testing and pressure analysis techniques, well planning, drilling optimization, enhanced recovery mechanisms, displacement theory and modelling. The course content will be adapted to the interest of the student as far as possible.

CROSSLISTED: MINE 4822.03

### **MINE 6009 Offshore Drilling and Production**

CREDIT HOURS: 3

This course is oriented toward the practical applications of offshore drilling, production, and completion technology in the ocean environment. Emphasis is placed on the types, applications and limitations of offshore rigs, platforms, and subsea production systems. The technical aspects of offshore islands, breakwaters, safety and fire protection, loading and transportation systems are also covered. The decision-making process based on economics and developing technology regarding offshore field development and production is presented as a case study.

CROSSLISTED: MINE 4823.03

### **MINE 6010 Solid-Liquid Separation**

CREDIT HOURS: 3

The course outlines the fundamental principles of solid-liquid separation processes. Based on this theory, scaling-up procedures for the various separators, from laboratory test results are given. Means of improving solid-liquid separation by using coagulants, flocculants or dewatering aids are discussed.

Processes considered include gravitational and centrifugal thickening, flotation, vacuum, pressure and centrifugal filtration and dewatering by screens and



electrophoretic methods. Test results obtained in laboratory work will be used in sizing of equipment.

### **MINE 6011 Advanced Mine Planning and Design**

CREDIT HOURS: 3

This course deals with the application of advanced design principles to the planning, design, and optimization of surface and underground mining systems. These principles include the Lerch-Grossman's algorithm, CAD and simulation modelling techniques. Under given geological and geomechanics factors, these techniques will be used for designing and optimizing underground mining methods or open pit layouts for massive, thin, pitching and multi-seam mineral deposits.

### **MINE 6012 Advanced Economic Evaluation of Mineral Resources**

CREDIT HOURS: 3

This course deals with the application of advanced statistical and probability theory in mineral resource investment risk and uncertainty analyses in random variable states. Numerical modelling of stochastic processes governing complex mineral resource projects will be carried out using derivative mine valuation concepts. Using available simulation and numerical modelling software packages, students will undertake projects on course studies in mineral resources, coal, oil, and gas properties.

### **MINE 6015 Advanced Mining Engineering Analysis**

CREDIT HOURS: 3

This course covers several topics in mining engineering analysis including mine drainage, shaft sinking techniques under difficult conditions and mine backfilling. Emphasis is placed on quantitative methods and software tools available to assist with analysis and design in these areas. Relevant case studies are presented to highlight the topics in the course. Students will also have to complete a computer or laboratory-based project.

PREREQUISITES: Permission of instructor

### **MINE 6016 Geo-Mechanical Measurements**

CREDIT HOURS: 3

This course deals with measurements typical for geo-mechanical research in the fields of mining, petroleum, and geotechnical engineering. Emphasis is placed on techniques and instrumentation for the measurement of load, deformation, permeability, and acoustic emissions/properties in rock and concrete materials. Topics cover issues related to data acquisition and analysis such as instrument drift/calibration, digital sampling theory, intrinsic safety, and scaling principles. Students will undertake a major laboratory project.

PREREQUISITES: Permission of Instructor

FORMATS: Lecture | Lab

### **MINE 6017 Mining and the Environment**

CREDIT HOURS: 3

This course covers environmental practices, problems, and solutions in the mining industry. Topics include regulations, reclamation, mine closure, acid rock drainage, surface subsidence, nuclear waste disposal and coal mine explosions. Case studies are used to highlight these topics. Class participation is emphasized through oral and written presentations.

PREREQUISITES: MINE 3500.03 or MINE 2200.03

CROSSLISTED: MINE 4815.03

FORMATS: Lecture | Lab

### **MINE 6021 Pit Slope Stability**

CREDIT HOURS: 3

This course deals with slope stability and the associated problems in surface mining. Fundamentals of various analysis techniques for slope stability are reviewed. Risk and uncertainty analysis is introduced. Application of these techniques to optimization of slope design is discussed. Major topics include geological structure controlled and strength-controlled slope failure, slope failure in soft ground, risk and uncertainty analysis, and optimization of slope design.

PREREQUISITES: MINE 3520.03, MINE 3611.03 or permission of instructor

### **MINE 6900 Graduate Seminar - Master's Level**

**CREDIT HOURS: 3**

This seminar course is designed to provide graduate students with the opportunity to search the literature for information on current topics related to their projects/thesis. All graduate students pursuing MEng and MASc degrees in the Mineral Resource Engineering program are required to take this course and offer their findings, orally in ONE presentation to the faculty members of the department and students, four months prior to the completion of their program. This presentation will be followed by a question-and-answer session. Graduate students might also be asked to submit a written version of their presentations (or a hard copy of their presentation slides) to the Graduate Coordinator of their department. This seminar course will be offered twice each academic year in the format of an end-of-term-conference in Fall and Winter semesters, respectively. Evaluation will be based on preparation, presentation skills, scientific content, ability to field questions and regular attendance. Graded pass/fail.

CALENDAR NOTES: (1) This is a required course for all Master students in the Department of Civil and Resource Engineering; (2) Registration of this course is for the fall and winter terms only.

**MINE 7007 Directed Studies in Mineral Resource Engineering**

**CREDIT HOURS: 3**

This course is available to Graduate Students enrolled in a PhD Program in Mineral Resource Engineering wishing to gain knowledge in a specific area for which no graduate level course is offered. Students are assigned an advisor and are required to present a formal report at the end of the course.

**MINE 7900 Graduate Seminar - PhD Level**

**CREDIT HOURS: 3**

This seminar course is designed to provide graduate students with the opportunity to search the literature for information on current topics related to their project/thesis. All graduate students pursuing a PhD degree in the Mineral Resource Engineering Program are required to take this course and offer their findings, orally, in TWO presentations to the faculty members of the department and students, in two intervals, before their thesis defense. The presentation will be followed by a question-and-answer session. Graduate students might also be asked to submit a written version of their presentations (or a hard copy of their presentation slides) to the Graduate Coordinator of their department. This seminar course will be offered twice each academic year in the format of an end-of-term-conference in Fall and Winter semesters, respectively. Evaluation will be based on preparation, presentation skills, scientific content, ability to field questions and regular attendance. Graded pass/fail.

CALENDAR NOTES: (1) This is a required course for all PhD students in the Department of Civil and Resource Engineering; (2) Registration of this course is required for the fall and winter term only.

**MINE 8891 Co-op Work-Term I**

**CREDIT HOURS: 0**

**MINE 8893 Co-op Work-Term III**

**CREDIT HOURS: 0**

**MINE 8894 Co-op Work-Term IV**

**CREDIT HOURS: 0**

**MINE 8900 Master of Engineering Project**

**CREDIT HOURS: 6**

This course gives students the opportunity to complete an in-depth project in an area of mineral resource engineering under the supervision of a faculty member. The study may consist of an engineering project, a laboratory research project, a field project, a modeling project, an advanced design project, an analysis of research data, or some combination thereof. Students enrolled in the project must submit a report of their work to their supervisor and give an oral presentation to their committee (supervisor plus a minimum of one internal reader).

**MINE 9000 Master's Thesis**

**CREDIT HOURS: 0**

**MINE 9530 PhD Thesis**  
CREDIT HOURS: 0

## Classics

Location:  
Marion McCain Arts & Social Sciences Building  
6135 University Avenue

PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3468  
Fax Number: (902) 494-2467  
Email Address: [claswww@dal.ca](mailto:claswww@dal.ca)  
Website: [classics.dal.ca](http://classics.dal.ca)

## Introduction

The Department of Classics welcomes students who wish to pursue MA and PhD degrees. Study may focus on the traditional subdisciplines of Greek and Roman Literature and History, as well as on Ancient Philosophy. Alternatively, students may opt to explore Classical culture and its legacy in several other areas of interest distinctively cultivated by members of the Classics faculty, along with colleagues in the Program in Religious Studies and Arabic. Such areas include late-antique, patristic, Byzantine, and medieval philosophy, theology, and religion.

Greek and Latin are taught at all levels, and competency in both languages is required for theses in the traditional areas of Classical Studies. Students focusing on the intersections of Classical and later thought in the Mediterranean world and the Middle East may, in consultation with the Graduate Coordinator and supervising faculty member, substitute Classical Arabic for either Latin or Greek. Students focusing mainly on Ancient Philosophy, Greek patristics, Byzantine philosophy and theology, Latin patristics, and Latin medieval philosophy and planning to continue their studies or pursue an academic career in these areas may, as appropriate, in consultation with the Graduate Coordinator and supervising faculty member, limit their language study to ancient and Byzantine Greek, or ancient and medieval Latin, or either of these in combination with Arabic. In addition to ancient languages, students are required to conduct research in the most relevant modern languages as well.

MA students may concentrate in any of the above fields. PhD candidates must limit their work to Hellenic and Hellenistic Studies.

## Staff

### Chairperson of Department

**Diamond, E.**, BA (Vind), MA (Dalhousie), PhD (Northwestern)

### Professor Emeriti

**Friedrich, R.**, PhD (Goettingen)

**Hankey, W. J.**, BA (Vind), MA (Toronto), PhD (Oxon)

### Professor

**Treiger, A.**, BA, MA (Hebrew Univ of Jerusalem), MPhil, PhD (Yale)

### Associate Professors

**Austin, C.**, BA, MA (Concordia), PhD (McMaster)

**Diamond, E.**, BA (Vind), MA (Dalhousie), PhD (Northwestern)

**Fournier, M.**, BA, MA (Dalhousie), PhD (Boston College)

**Mitchell, J.**, BA (McGill), PhD (Stanford)  
**Varto, E.**, BA (Queen's), MA (Dalhousie), PhD (UBC) - Graduate Coordinator

### **Assistant Professors**

**MacLeod, L.**, BA (Brock), MA, PhD (Dalhousie)  
**O'Brien, P.**, BA (Vind), MA (Dalhousie), MA, PhD (BU)

### **Cross-listed Faculty**

**Curran, T. H.**, BA (Toronto), MA (Dalhousie), MTh (AST), PhD (Durham)  
**Fraser, K. A.**, BA (Vind), MA (Dalhousie), MPhil, PhD (Cambridge)  
**King, E.**, BA (Vind), MA (Dalhousie), PhD (Cambridge)  
**Robertson, N.**, BA (Vind), MA (Dalhousie), PhD (Cambridge)  
**Stewart, I. G.**, BSc (Trent), MA (Toronto), PhD (Cambridge)  
**Thorne, G.**, BA (Acadia), MA (Dalhousie), MDiv (AST), PhD (Durham)

### **Adjunct (FGS)**

**Bonasio, G.**, BA, MA (Padova); MA, PhD (Columbia)  
**Friedrich, R.**, PhD (Goettingen)  
**Ingalls, R.**, BA (Winnipeg), MA (Manitoba), MDiv (Nashotah), PhD (Wales Lampeter)  
**Roman, L.**, BA (Harvard), PhD (Stanford)

### **Adjunct (Retired)**

**Hankey, W. J.**, BA (Vind), MA (Toronto), PhD (Oxon)

## **Admission Requirements**

### **Masters Degree**

Candidates must satisfy the admission requirements of the Faculty of Graduate Studies. For students wishing to pursue traditional Classics degrees, the requirement of both Classical languages at the Honours level may sometimes be relaxed, for example when a student has taken a Combined Honours course involving only one Classical language. In such cases, at least two courses in the second language will be taken in addition to the MA course proper. Students focusing mainly on ancient Philosophy, Greek patristics, Byzantine philosophy and theology, Latin patristics, and Latin medieval philosophy should see the statement above. In certain programs, knowledge of other ancient languages may be required.

#### ***Procedure***

Students contemplating studying for a Masters degree should count on spending at least a full year to complete their courses and thesis. It typically takes two full years.

Eighteen credit hours in the general area of interest are required. It may be possible to substitute a reading and research course for a seminar. Candidates are expected to attend graduate seminars related to their thesis throughout their period of full-time study. A thesis, usually between 100 and 150 pages, is required.

### **Doctor of Philosophy degree**

The normal admission requirement is the MA in Classics or equivalent preparation. The minimum residence requirement for such candidates is two years, during which time they must satisfy the general requirements of the Faculty, and, in addition, must demonstrate competence in the languages (ancient and modern) necessary for research in their particular fields of study.

#### ***Procedure***

All candidates are expected to have a broad understanding of all aspects of Classical culture. Within the general area of Hellenic-Hellenistic Studies, each candidate is expected to concentrate, with the guidance of a supervising committee, in one of three fields: History, Literature, and Philosophy.

In consultation with their supervising committee, PhD candidates will take such courses as are deemed necessary preparation.

Before submitting a thesis, the candidate must pass a comprehensive examination (written and oral) in his or her special field. This will normally be taken towards the end of the second or beginning of the third year of study.

PhD students should consult the Department's Graduate Studies Handbook, the Graduate Calendar, and obtain a copy of the departmental regulations governing the PhD program for further information.

## Application

Masters and doctoral applicants should apply using the forms available at the Faculty of Graduate Studies website [www.dal.ca/faculty/gradstudies/graduate-programs-admissions.html](http://www.dal.ca/faculty/gradstudies/graduate-programs-admissions.html). Please note that in addition to the materials required by the Dalhousie Faculty of Graduate Studies, the Department of Classics requests an additional letter of reference (for a total of three), a writing sample (e.g. a term paper or thesis chapter of about 20 pages) a personal statement and a list of Greek and Latin texts which the applicant has read in the original language. In the personal statement you should present yourself as an applicant, explaining your motivation for pursuing graduate study, your educational background, and anything else which seems relevant to your application. You should explain why you think you would be a good fit for Dalhousie Classics, and mention specific faculty members with whom you are interested in working. If you have a specific idea for your MA thesis, you could describe it, but you should also explain what your research interests are more generally.

## Funding

All applicants for the MA program will be considered, on a competitive basis, for scholarship funding. Such funding is available in three forms: Faculty of Graduate Studies (FGS) Scholarships, Social Sciences and Humanities Research Council of Canada (SSHRC) Scholarships, and Izaak Walton Killam Predoctoral Scholarships (more information on the Killam Scholarship here [killamtrusts.dal.ca/](http://killamtrusts.dal.ca/)). Candidates who are Canadian citizens or permanent residents and who wish to be considered for FGS Scholarships are strongly encouraged to apply for the relevant scholarships or fellowships offered by SSHRC (further information available at [www.sshrc.ca](http://www.sshrc.ca)). The deadlines for SSHRC applications fall in the autumn of the year preceding the year in which studies begin. Candidates who are Canadian citizens or permanent residents and who wish to be considered for the Killam Scholarship MUST apply for the relevant scholarships or fellowships offered by SSHRC.

All candidates wishing to be considered for departmentally administered scholarships should note that the application deadlines set by the Department (April 1), falls well in advance of the admission deadline of June 1: Killam Scholarships and FGS Scholarships, December 1.

PhD students will only be accepted with external scholarship funding (e.g., SSHRC or Killam Scholarships). They are not eligible for FGS Scholarships in the Department of Classics.

All admitted students (MA and PhD) will be considered for a Graduate Teaching Assistantship.

For more information, email our Graduate Advisor at [clasgrad@dal.ca](mailto:clasgrad@dal.ca).

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Courses Offered

### Greek and Latin Literature

CLAS 5022.03: Reading and Research in Greek Epic II

CLAS 5035.03: Advanced Latin Seminar: Latin Literature II

CLAS 5036.03: Advanced Latin Seminar: War and Peace

CLAS 5038.03: Advanced Latin Seminar: Myth and History

CLAS 5041.03: Advanced Latin Seminar: Roman Poetry I

CLAS 5042.03: Advanced Latin Seminar: Roman Poetry II

CLAS 5120.03: Advanced Greek Seminar: Greek Authors II  
CLAS 5121.03: Advanced Greek Seminar: Epic I

### **Ancient History**

CLAS 5037.03: Advanced Latin Seminar: Human and Divine  
CLAS 5531.03: Roman Empire and the Rise of Christianity  
CLAS 5540.03: Ammianus Marcellinus and his World  
CLAS 5545.03: Roman Culture and Roman Politics in the Transition to Autocracy  
CLAS 5552.03: Reading and Research in Ancient History I  
CLAS 5559.03: Advanced Greek Seminar: History II

### **Classical Philosophy**

CLAS 5060.03: The Consolation of Philosophy  
CLAS 5606.03: Greek Philosophical Texts  
CLAS 5609.03: Advanced Greek Seminar: Philosophy II  
CLAS 5610.03: Latin Philosophical Texts  
CLAS 5611.03: Hellenistic Philosophy: Stoics and Epicureans  
CLAS 5612.03: Hellenistic Philosophy: From Skepticism to Neoplatonism  
CLAS 5613.03: The Dialogues of Plato  
CLAS 5614.03: Aristotle  
CLAS 5616.03: Advanced Greek Seminar: Philosophy  
CLAS 5623.03: Plato's Republic  
CLAS 5624.03: Plato's Late Dialogues  
CLAS 5817.03: Islamic Philosophy: al-Ghazali

### **Patristics**

CLAS 5060.03: Boethius and Prosimetrum: Poetry and Prose in the Consolation of Philosophy  
CLAS 5070.03: A Study of the Latin Text of Augustine's 'Confessions'  
CLAS 5708.03: Reading and Research: Christian Beginnings and the Early History of the Church  
CLAS 5818.03: Christian Theology in the Lands of Islam: John of Damascus  
CLAS 5819.03: Philo Judaeus

CLAS 9000.00: Master's Thesis  
CLAS 9530.00: Doctoral Thesis

## **Course Descriptions**

### **CLAS 5021 Reading and Research in Greek Literature**

CREDIT HOURS: 3

Studies in Greek literature in the original language, works studied change from year to year.

### **CLAS 5022 Advanced Greek Seminar: Epic II**

CREDIT HOURS: 3

### **CLAS 5035 Advanced Latin Seminar: Latin Literature II**

CREDIT HOURS: 3

Studies in Latin literature in the original language, works studied change from year to year.

EXCLUSIONS: CLAS 5030X/Y.06

FORMATS: Seminar

### **CLAS 5036 Advanced Latin Seminar: War and Peace**

CREDIT HOURS: 3

EXCLUSIONS: CLAS 5031X/Y.06

FORMATS: Seminar

**CLAS 5037 Advanced Latin Seminar: Human and Devine**

CREDIT HOURS: 3

EXCLUSIONS: CLAS 5032X/Y.06

FORMATS: Seminar

**CLAS 5038 Advanced Latin Seminar: Myth and History**

CREDIT HOURS: 3

EXCLUSIONS: CLAS 5033X/Y.06

FORMATS: Seminar

**CLAS 5040 A Study of Vergil**

CREDIT HOURS: 6

A study of the development and importance of Vergil's basic themes and ideas embodied in the Aeneid. In the first part of the course special attention is given to his early work the Bucolics, where his themes begin to appear, and their development is then followed through the relevant parts of the Georgics. The main part of the course is devoted to the reading and discussion of the chief themes of the Aeneid, especially as they illustrate Roman political, religious, and social ideas which have greatly influenced our own beliefs and institutions.

**CLAS 5041 Advanced Latin Seminar: Roman Poetry I**

CREDIT HOURS: 3

**CLAS 5042 Advanced Latin Seminar: Roman Poetry II**

CREDIT HOURS: 3

**CLAS 5060 The Consolation of Philosophy**

CREDIT HOURS: 3

Boethius' Consolation is a strange example of Menippean satire, which is itself a strange genre. This course will consider the poetry, the prose and, most significantly, how these elements are combined in order to achieve the goal of the work, which is to offer consolation to the reader.

**CLAS 5070 A Study of the Latin Text of Augustine's 'Confessions'**

CREDIT HOURS: 3

This course approaches the thought of St. Augustine through a study of various literary, philosophical, and spiritual aspects of the Latin text of his "Confessions".

PREREQUISITES: CLAS 3810.03 or the permission of the instructor.

FORMATS: Seminar

**CLAS 5107 Sappho**

CREDIT HOURS: 3

**CLAS 5110 Advanced Greek Seminar: Greek Authors I**

CREDIT HOURS: 3

FORMATS: Seminar

**CLAS 5111 Advanced Greek Seminar: Tragedy II**

CREDIT HOURS: 3

FORMATS: Seminar

**CLAS 5112 Advanced Greek Seminar: Greek Poetry II**

CREDIT HOURS: 3

EXCLUSIONS: CLAS 5012X/Y.06

FORMATS: Seminar

**CLAS 5113 Advanced Greek Seminar: Greek Poetry I**

CREDIT HOURS: 3

A study of lyric poets such as Sappho, Archilochus, Simonides in the original language.

EXCLUSIONS: CLAS 5013X/Y.06

FORMATS: Seminar

**CLAS 5120 Advanced Greek Seminar: Greek Authors II**

CREDIT HOURS: 3

Studies in Greek literature in the original language, works studied change from year to year.

**CLAS 5121 Advanced Greek Seminar: Epic I**

CREDIT HOURS: 3

EXCLUSIONS: CLAS 5020X/Y.06, CLAS 5021X/Y.03

FORMATS: Lecture

**CLAS 5370 The Augustinian Tradition**

CREDIT HOURS: 6

The course considers the effect of Augustine on the philosophical and theological thought of late Antiquity and the Middle Ages.

**CLAS 5521 Advanced Latin Seminar: Friends and Enemies**

CREDIT HOURS: 3

EXCLUSIONS: CLAS 5520.06

FORMATS: Lecture

**CLAS 5530 Ancient Religion: Classical Antiquity to the Rise of Christianity**

CREDIT HOURS: 6

Selected topics from the transition from Classical to Christian culture are studied. Particular attention is paid to the connection between religious innovation and the effect of the new beliefs on literature, art and philosophy.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.



**CLAS 5531 Roman Empire and the Rise of Christianity**

CREDIT HOURS: 3

**CLAS 5535 Rome and the East**

CREDIT HOURS: 6

This course will consider relations between Rome and her eastern neighbors -- the Parthians and the Sasanians -- from 53 B.C. To A.D. 628. It will examine the development of Roman policy in the region from the establishment of imperial control in the Near East to the costly wars of the early Byzantine period. Consideration will also be given to the Parthian and Persian kingdoms and to the frontier region.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

**CLAS 5540 Ammianus Marcellinus and his World**

CREDIT HOURS: 3

This course approaches the history and culture of the fourth century AD through its most important historian, Ammianus Marcellinus. The course will focus on (but not be limited to) a careful study of Books 14-25 of the *Res Gestae*, which span the reign of Ammianus' hero, Julian the Apostate.

PREREQUISITES: Three years of undergraduate Latin or the permission of the instructor.

FORMATS: Seminar

**CLAS 5545 Roman Culture and Roman Politics in the Transition to Autocracy**

CREDIT HOURS: 3

A study of the cultural and political history of Rome during the principate of Augustus; we will focus on the reformation of Roman elite culture during this period in light of the intellectual tradition of the late republic and the cultural politics of the age of Nero.

COREQUISITES: CLAS 4545.03

FORMATS: Seminar

**CLAS 5552 Reading and Research in Ancient History I**

CREDIT HOURS: 3

**CLAS 5559 Advanced Greek Seminar: History II**

CREDIT HOURS: 3

EXCLUSIONS: CLAS 5550X/Y.06

**CLAS 5602 Aristotle**

CREDIT HOURS: 6

This seminar involves the detailed study of either Aristotle's *Metaphysics* or *De Anima* or *Physics* or ethical and political treatises. The choice of texts varies from year to year.

**CLAS 5605 Neoplatonism: Plato and Neoplatonism**

CREDIT HOURS: 6

The philosophy of Plotinus and later thinkers considered as the resume of Greek Philosophy; in particular, the role of Plato and other older philosophers in the formation of Neoplatonism is a principal interest.

**CLAS 5608 Reading and Research**

CREDIT HOURS: 6

**CLAS 5609 Advanced Greek Seminar: Philosophy II**

CREDIT HOURS: 3

**CLAS 5610 Latin Philosophical Texts**

CREDIT HOURS: 3

**CLAS 5611 Hellenistic Philosophy - Stoics and Epicureans**

CREDIT HOURS: 3

A study of philosophy in the Hellenistic Age. We will investigate the development of Greek and Roman Philosophy after Aristotle, focusing on Stoicism and Epicureanism. The course covers the logic, physics, and ethics of these philosophical schools, as well as their religious dimension.

PREREQUISITES: CLAS 2361.03/CLAS 2362.03, or permission from instructor

CROSSLISTED: CLAS 4601.03, RELS 4601.03

FORMATS: Seminar

**CLAS 5612 Hellenistic Philosophy from Skepticism to Neoplatonism**

CREDIT HOURS: 3

A study of philosophy in the Hellenistic Age. We will investigate the development of Greek and Roman Philosophy, focusing on Pyrrhonian and Academic Skepticism, as well as Middle Platonism. The course covers the logic, physics, and ethics of these philosophical schools, as well as their religious dimension.

PREREQUISITES: CLAS 2361.03/CLAS 2362.03, or permission from instructor

CROSSLISTED: CLAS 4602.03, RELS 4602.03

FORMATS: Seminar

**CLAS 5613 The Dialogues of Plato**

CREDIT HOURS: 3

A careful reading of a selection of Platonic dialogues. The dialogues studied will vary from year to year.

EXCLUSIONS: CLAS 3400.03, CLAS 5603.03, CLAS 3401.03

FORMATS: Seminar

**CLAS 5614 Aristotle**

CREDIT HOURS: 3

A careful reading of an Aristotelian treatise, or selections from several treatises. The treatise studied will vary from year to year.

CROSSLISTED: CLAS 3503.03

RESTRICTIONS: Registered in a graduate program

**CLAS 5616 Advanced Greek Seminar: Philosophy I**

CREDIT HOURS: 3

EXCLUSIONS: CLAS 5606X/Y.06

FORMATS: Seminar

**CLAS 5623 Plato's Republic**

CREDIT HOURS: 3

This seminar involves the detailed study of a group of dialogues. The choice of dialogues varies from year to year.

EXCLUSIONS: CLAS 5603.06

FORMATS: Seminar

**CLAS 5624 Plato's Late Dialogues**

CREDIT HOURS: 3

This seminar involves the detailed study of a group of dialogues. The choice of dialogues varies from year to year.

EXCLUSIONS: CLAS 5613.06

FORMATS: Seminar

**CLAS 5700 Philosophy of the Church Fathers**

CREDIT HOURS: 6

This seminar involves the detailed study of a text, or group of texts, from one or more of the Greek or Latin Church Fathers. The choice of text varies from year to year, in relation to the needs and interests of students.

**CLAS 5701 Medieval Interpreters of Aristotle**

CREDIT HOURS: 6

The course considers Latin philosophical texts of the Middle Ages.

**CLAS 5705 St Augustine I**

CREDIT HOURS: 6

A study of the three parts of Augustine's Confessions with a view to understanding his dissatisfaction with the various positions he adopted prior to his conversion to Christianity (Part I), the practical consequences of this conversion (Part II), and the new theoretical understanding of time, space and motion which come out of his Trinitarian exegesis of the first chapters of Genesis (Part III). This course presupposes some knowledge of the history of Ancient Philosophy, and some of Latin.

**CLAS 5706 St Augustine's City of God**

CREDIT HOURS: 6

A study of Augustine's account of the failure of the Roman Empire and of the new Christian 'city' that replaced it. The course sometimes concentrates on a definition of the new Christian state in second part (books XI to XXII) of the City of God and sometimes begins with a study of earlier accounts of Rome (Aeneid), and of the relations of Rome and the church in, for example, the Apostolic Fathers, the Acts of the Martyrs and Tertullian, before turning to the first ten books of the City of God.

**CLAS 5707 St. Augustine's on the Trinity**

CREDIT HOURS: 6

A study of the 15 books of Augustine's De Trinitate. The first term will concentrate on Books 1-7 in which he establishes what is the orthodox teaching about God through Scripture and a consideration of the categories of substance, relation, and act. The second term examines Books 8-15 in which he attempts to understand what has been shown in the first 7 books through the distinction of scientia and sapientia. The course presupposes some knowledge of the history of ancient philosophy (especially Aristotle & Neo-Platonism) and some of Latin.

**CLAS 5708 Reading and Research: Christian Beginnings and the Early History of the Church**

CREDIT HOURS: 3

**CLAS 5801 Christianity and Neoplatonism**

CREDIT HOURS: 6

**CLAS 5817 Islamic Philosophy: al-Ghazali**

CREDIT HOURS: 3

Abu Hamid al-Ghazali (1058-1111) is one of the greatest Muslim thinkers of all time. This course is an introduction to his thought, focusing on al-Ghazali's "two-tier" approach to theology – exoteric theology for the masses and esoteric theology for the select few – and on his attitude to Islamic philosophy and

Islamic mysticism (Sufism).  
CROSSLISTED: CLAS 4010.03, RELS 4010.03  
FORMATS: Seminar

### **CLAS 5818 Christian Theology in the Lands of Islam: John of Damascus**

CREDIT HOURS: 3

John of Damascus (d. 749) is one of the greatest Christian theologians of the Patristic age. Though he wrote in Greek, he was a Christian Arab (his Arabic name is Mansur ibn Sarjun), who lived under Muslim rule and was employed as a public official in the Umayyad administration in Damascus. The course will focus on his theological works (especially his summa of Christian theology, entitled *On the Orthodox Faith*, and his three treatises in defence of the icons), their Christian sources, and their Islamic context.

PREREQUISITES: At least one of RELS 1002.03, RELS 2004.03, RELS 2281.03, RELS 2282.03 RELS 3009.03 Foundation Year Program or permission of instructor

CROSSLISTED: CLAS 4018.03, RELS 4018.03

### **CLAS 5819 Philo Judaeus**

CREDIT HOURS: 3

Reconciling Jewish Scripture and Plato, Philo culminates Second Temple Jewish thought and founds the Christian treatment of Scripture. He is the most influential Jewish theologian and presents the High Priest as priest of the cosmos so he is crucial both to understand our past and to carry us into the future.

PREREQUISITES: Must be registered in a graduate program

CROSSLISTED: CLAS 4019.03

FORMATS: Seminar

### **CLAS 5901 Reading and Research**

CREDIT HOURS: 6

### **CLAS 9000 Master's Thesis**

CREDIT HOURS: 0

### **CLAS 9530 Doctoral Thesis**

CREDIT HOURS: 0

## **Clinical Vision Science**

Location:

IWK Health Centre  
5850/5980 University Avenue  
6th Floor, Eye Clinic, Children's Building  
PO BOX 9700  
Halifax NS  
B3K 6R8

Phone Number: (902) 470-8019  
Fax Number: (902) 470-7207  
Email Address: [cvsinfo@dal.ca](mailto:cvsinfo@dal.ca)  
Website: [dal.ca/cvs](http://dal.ca/cvs)

## **Introduction**

Dalhousie University offers its Clinical Vision Science Program in cooperation with the IWK Health Centre. The program provides students interested in the profession of orthoptics and ophthalmic medical technology with a strong foundation in the vision sciences and in research techniques.

Orthoptists/ophthalmic medical technologists are professionals integral to eye care. They perform diagnostic and highly technical procedures, and, in consultation with an ophthalmologist, they plan, implement and monitor treatment of a wide range of ocular disorders, including disorders of binocular vision and ocular motility. They are engaged in activities including research into ocular motility, education of other eye care professionals, patient education and vision screening.

The Clinical Vision Science Program is directed at optimizing professional clinical practice by encouraging an integrated approach to the field of the vision sciences and expanding knowledge of the research that underpins much of clinical practice. With its research component, the program ensures that graduates, as evidence-based practitioners, are prepared for both clinical and research-based practices and that they have the ability to analyze and relate research findings to clinical experience, skills vital for ensuring superior diagnostic and therapeutic services.

The program equips students with outstanding skills in the assessment, diagnosis, and treatment of ocular disorders to ensure strong clinical competence and to enable them to be full participants in the interdisciplinary model of eye-care. Students are exposed to a variety of clinical experiences that prepares them for the independent nature of professional practice.

Students have the option of exiting from the program after the second program year with a Graduate Diploma in Orthoptics and Ophthalmic Medical Technology, or of continuing further study to complete a thesis for Masters in Clinical Vision Science.

Dalhousie University is offering the Clinical Vision Science Program also in distance education. The distance delivery model is a flexible, Internet-based adaptation of the on-campus program.

## Staff

### Program Chair, CVS and Assistant Dean, Faculty of Health

**Oystreck, D. T.**, BSc (Saskatchewan), MMedSci (Sheffield), OC(C), COMT, PhD (Stellenbosch)

### Coordinator, CVS, Faculty of Health

**Pickering, J.D.**, BSc (Dalhousie), OC(C), COMT, CLVT

### Professor

#### Associate Professors

**Hahn, E.**, BPE, MSc (Dalhousie), OC(C), COMT, DO, CCLF, RO

**Oystreck, D.T.**, BSc (Saskatchewan), MMedSci (Sheffield), OC(C), COMT, PhD (Stellenbosch)

**Walsh, L.**, BSc, MSc (Dalhousie), OC(C), COMT

#### Assistant Professors

**Algee, K.**, BSc, MSc (Dalhousie), OC(C), COMT

**Betts, M.**, BSc, MSc (Dalhousie), OC(C), COMT

**Fennell-Al Sayed, H.**, BSc, MSc (Dalhousie), OC(C), COMT

**Pryde, M.**, BSc, MSc (Dalhousie), OC(C), COMT

**Smith, S.**, BSc, MSc (Dalhousie), OC(C), COMT

**Van-Ilderstine, S.**, BSc, MSc (Dalhousie), CCRP

#### Cross-appointed Professors

**LaRoche, R.**, BSc, MD (McGill), FRCSC, major appointment in Department of Ophthalmology and Visual Sciences

**MacKenzie, D.**, BSc (OT) (Alberta), MA(Ed) (MSVU), PhD (Dalhousie), major appointment in School of Occupational Therapy

**Robitaille, J.**, MDCM (McGill), major appointment in Department of Ophthalmology and Visual Sciences, cross appointment in Department of Pathology, Department of Pediatrics

**Tremblay, F.**, BSc, PhD (Montreal), major appointment in Department of Ophthalmology and Visual Sciences, cross appointment in Department of Physiology and Biophysics

**Westwood, D. A.**, BSc, MA, PhD (Waterloo), major appointment in School of Health and Human Performance

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. Admission requirement is a four-year bachelor's degree from a recognized institution of higher education with a minimum of a B average (GPA 3.0).

Students whose native language is not English, must also, as required by the Faculty of Graduate Studies, provide proof of their ability to participate in a graduate program conducted in English prior to their acceptance to the program.

In addition, there are program specific admission requirements for candidates to the Clinical Vision Science Program. Applicants are expected to have one or more undergraduate courses in the following subjects: human anatomy, neuroscience (e.g., neuroanatomy, neurophysiology, etc.), psychology, physiology, biology, biochemistry, psychophysics. It is also recommended that students have completed courses in research methods (e.g., statistics or research design).

For detailed information on the admission requirements and the application process consult the [Clinical Vision Science Program](#) website.

**The application deadline is March 1st.**

## Curriculum

The core program consists of two program years of required courses and two extended clinical practice. Together with supervised thesis work the Master's Program typically takes three years to finish, with an upper limit of five years. Students pay two years (six terms) full time fees, and a thesis continuation fee is charged each term after the two years.

### Course list:

- VISC 5010.03: Fundamentals of Vision Science: Afferent System
- VISC 5011.03: Fundamentals of Vision Science: Efferent System
- VISC 5020.03: Physical and Visual Optics
- VISC 5031.03: Introduction to Research Theory and Practice for Vision Sciences
- VISC 5040.03: Neuropharmacology for Vision Science: Basic Concepts and Therapeutics
- VISC 5200.06: Practicum I
- VISC 5210.03: Clinical Foundations of Ophthalmic Medical Technology
- VISC 5211.03: Clinical Foundations of Orthoptics
- VISC 5222.06: Advanced Ophthalmic Technology for Clinical Vision Science
- VISC 5230.03: Extraocular Motility Disorders
- VISC 5240.03: Therapeutic and Psychosocial Aspects of Low Vision
- VISC 5300.06: Practicum II
- VISC 5310.03: Ocular Manifestations of Systemic Disease
- VISC 5330.03: Treatment of Ocular Motility Disorders
- VISC 5340.03: Treatment of Visual Disorders
- VISC 5350.03: Topics in Vision Care
- VISC 9000: MSc Thesis
- IPHE 5900: Interprofessional Health Education

**MSc Thesis** - N/A for Graduate Diploma in Orthoptics and Ophthalmic Medical Technology.

### Interprofessional Health Education

Clinical Vision Science students are required to maintain enrolment in IPHE 5900 during their academic studies. Successful completion of this course will be recognized by the Faculty of Health with the awarding of a special Certificate in Interprofessional Collaboration.

### Practicum/Fieldwork Placements outside Halifax

Students are advised that they may have to do some of their required clinical education/fieldwork at sites outside Halifax, and hence may have to incur additional personal expenses for travel and temporary accommodation.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **VISC 5010 Fundamentals of Vision Science: Afferent System**

CREDIT HOURS: 3

This course is designed to acquaint the student with the anatomy/physiology of the human central nervous system as it relates to the sensation of vision. Testing parameters used in the afferent visual system examination will be discussed. Recent developments in perimetry, clinical psychophysics, and electrophysiology will be explored.

FORMATS: Lecture

### **VISC 5011 Fundamentals of Vision Science: Efferent System**

CREDIT HOURS: 3

This course is designed to provide the student with knowledge of eye movements and the neurological control of ocular motility. Through lecture, discussion, and assigned readings, the student will analyze and determine how abnormalities of ocular motility can be indicators of a disease process and its area of localization.

PREREQUISITES: VISC 5010.03

FORMATS: Lecture

### **VISC 5020 Physical and Visual Optics**

CREDIT HOURS: 3

This course will analyze physical, optical, and ophthalmic principles, with an emphasis on the measurement of light and on its behaviour in image formation. Visual optics in physical, schematic, and human modalities will be investigated critically in experiment and clinical venues.

PREREQUISITES: This course is a prerequisite for the Therapeutic and Psychosocial Aspects of Low Vision, Treatment of Visual Disorders, and Treatment of Ocular Motility disorders.

FORMATS: Lecture | Lab

### **VISC 5031 Introduction to Research Theory and Practice for Vision Sciences**

CREDIT HOURS: 3

Students will acquire theoretical and practical skills to conduct a research undertaking in vision science. Scope of human inquiry, methodologies of interpretative and critical investigation, sampling and data analysis will be discussed in the clinical visual health sciences environment. Basic skills in the application of computer-based tools (SPSS) will be developed.

FORMATS: Other (explain in comments)

### **VISC 5040 Neuropharmacology for Vision Science: Basic Concepts and Therapeutics**

CREDIT HOURS: 3

This course will consider the general principles of pharmacology before exploring the interaction pharmacology agents with the central nervous system and ocular structures. Medications used in the evaluation and treatment of ophthalmic disorders, along with medications used to treat systemic disorders that may produce ocular side effects, will be emphasized.

FORMATS: Lecture

### **VISC 5200 Practicum I**

CREDIT HOURS: 6

This practicum period of 14 weeks following the first two semesters of study provides the student with the opportunity to participate in direct ophthalmic patient care. The student will consolidate the concepts, theories and skills previously learned while providing supervised vision care for clients in a clinic setting.

PREREQUISITES: VISC 5210.03, VISC 5211.03 and VISC 5230.03

FORMATS: Other (explain in comments)

**VISC 5210 Clinical Foundations of Ophthalmic Medical Technology**

CREDIT HOURS: 3

This course will introduce the student to the complexities of analysis of the visual system. This will be achieved through clinical scenarios in which the student will be required to engage in direct patient care, including sensory visual evaluation, physical ocular assessment, and biomedical application of ophthalmic instrumentation.

PREREQUISITES: VISC 5010.03 to be taken concurrently

FORMATS: Lecture | Lab

**VISC 5211 Clinical Foundations of Orthoptics**

CREDIT HOURS: 3

This course will introduce the student to the wonders of binocular vision in its normal presentation and also the intricacies of its abnormalities. Integral to the course material will be the analysis of responses of the binocular system to various clinical challenges.

COREQUISITES: VISC 5010.03

PREREQUISITES: This course is a prerequisite for Practicum I

FORMATS: Lecture | Lab

**VISC 5222 Advanced Ophthalmic Technology for Clinical Vision Science**

CREDIT HOURS: 6

This course provides knowledge on advanced ophthalmic diagnostic techniques and preliminary data analysis used to detect ophthalmic disorders. It furthers a systematic approach to instrumentation selection and performance and will equip students with the ability to recognize and solve inconsistencies in results occurring due to instrumentation, examiner or patient errors.

PREREQUISITES: VISC 5210.03

FORMATS: Lecture | Lab

**VISC 5230 Extraocular Motility Disorders**

CREDIT HOURS: 3

Extraocular motility disorders and their treatment form the foundation for the understanding of ocular misalignment. In this course, anomalies of eye movement will be analyzed, and the etiology will be reviewed. Emphasis, though, will be placed on the clinical presentation, formulation of diagnosis, and patient prognosis of anomalous extraocular motility.

PREREQUISITES: VISC 5010.03 to be taken concurrently

FORMATS: Lecture

**VISC 5240 Therapeutic and Psychosocial Aspects of Low Vision**

CREDIT HOURS: 3

This course encompasses a broad spectrum of visual impairments. The pathophysiological basis, clinical manifestations, and treatment modalities of visual loss will be addressed.

PREREQUISITES: VISC 5020.03

FORMATS: Lecture | Lab

**VISC 5300 Practicum II**

CREDIT HOURS: 6

This intensive practicum period of 22 weeks follows the completion of all course work. During this practicum students will have the opportunity to fully synthesize their academic and clinic knowledge. Upon completion students will be prepared to sit the orthoptic and ophthalmic medical technologist certification exams.

PREREQUISITES: VISC 5200.06 and VISC 5330.03

FORMATS: Other (explain in comments)

**VISC 5310 Ocular Manifestations of Systemic Disease**

CREDIT HOURS: 3

The eye is a window through which manifestations of neurological, vascular infectious, inflammatory, and general systemic disease can be evaluated. This



course will explore the signs and symptoms of ocular dysfunction as precursors, indicators and consequences of systemic disease that must be evaluated for optimal healthcare.

PREREQUISITES: VISC 5011.03

FORMATS: Lecture

### **VISC 5330 Treatment of Ocular Motility Disorders**

CREDIT HOURS: 3

This course will examine and discuss the management of ocular motility anomalies. An overview of historical and current treatment modalities both surgical and non-surgical will be discussed. Emphasis will be given to the determination and application of appropriate management plans in case scenarios.

PREREQUISITES: VISC 5020.03 and VISC 5230.03

FORMATS: Lecture

### **VISC 5340 Treatment of Visual Disorders**

CREDIT HOURS: 3

This course introduces a variety of therapeutic approaches to visual disorders with an in-depth examination of historical and current methods of treating amblyopia and other developmental anomalies of the visual system. The treatment of acquired anomalies as well as routine spectacle and surgical treatment of refractive disorder will be covered.

PREREQUISITES: VISC 5240.03 and VISC 5020.03

FORMATS: Lecture | Lab

### **VISC 5350 Topics of Vision Care**

CREDIT HOURS: 3

This course will provide students with an opportunity to explore in depth topics of interest in the ophthalmic field. The students will then have a sound knowledge base of potential areas of research and detailed knowledge of the field in which his/her thesis work will likely be undertaken.

PREREQUISITES: VISC 5210.03 and VISC 5222.06.

FORMATS: Seminar

### **VISC 9000 MSc Thesis**

CREDIT HOURS: 0

## **Communication Sciences and Disorders**

Location:

Sir Charles Tupper Medical Building

5850 College Street

2nd Floor, Room 2C01

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-7052

Fax Number: (902) 494-5151

Email Address: [scsd@dal.ca](mailto:scsd@dal.ca)

Website: [www.dal.ca/faculty/health/scsd.html](http://www.dal.ca/faculty/health/scsd.html)

## **Staff**

### **Director and Assistant Dean**

Kiefte, M., BA, MSc, PhD (Alberta)

### **Professors Emeriti**

**Armson, J.,** BA, MSc, PhD (Temple)

### **Professors**

**Cleave, P.,** BA/BSW, MCISc, PhD (Kansas). Specific language impairment, Down syndrome, treatment efficacy, language disorders, intervention

**Kay-Raining Bird, E.,** BA, MSc, PhD (Wisconsin). Child language development/disorders, Down syndrome, autism, assessment, intervention

**Kiefte, M.,** BA, MSc, PhD (Alberta). Speech and auditory perception

**Wang, J.,** BS, MA, PhD (SUNY). Central auditory and cochlear physiology/pathology

### **Associate Professors**

**Aiken, S.,** BA, MSc, PhD (Toronto). Electrophysiology, diagnostic audiology, hearing aids

**Caissie, R.,** BPs, MSc, PhD (McGill). Audiological rehabilitation of adults, hearing aids, hearing loss and aging

**Hickey, E.,** BS, MA, PhD (Washington). Treatment of neurological communication disorders, and disability and development/global health issues

**Hong, P.,** BSc, MD (Ottawa), FRCS(C). Pediatric otolaryngology, pediatric hearing, microtia reconstruction, external ear, pediatric hearing loss. Appointment in the Department of Surgery, Faculty of Medicine

**Ingles, J.,** BA, PhD (Dalhousie). Adult neurogenic language and cognitive disorders

### **Assistant Professor**

**Affoo, R.,** BHSc, MCISc, PhD (Western)

### **Instructor**

**Harris, L.,** BSc, MSc (Western)

### **Academic Coordinators of Clinical Education**

**Balkam, E.,** BA, MSc (Dalhousie). Speech-language pathology

**Mason, S.,** BSc, MSISc, AuD (A. T. Stills). Audiology

### **Adjunct (FGS)**

**Alexander, B.,** BSc, MA, AuD (Central Michigan)

**Comeau, M.,** BSc, MSc (Dalhousie)

**Delorey, R.,** BSc, MSc (UWO)

**Fergusson, D.,** BSc, MSc (Dalhousie)

**Fillmore, J.,** BSc, MSc (Dalhousie)

**Harrison, J.,** BSc, MSc, AuD (A.T. Stills)

**Noel, G.,** BA, MSc, AuD (A. T. Stills)

**Parker, J.,** BASc, ECE, MSc (Dalhousie)

**Santilli, C.,** BCS, MSc (Dalhousie)

**Schmidbauer, J.,** BA, MA (SUNY)

**Tremblay, K.,** BA, MSc, PhD (Northwestern)

**Verge, J.,** BSc, MSc (Dalhousie)

**Wilson, S.,** BA, MSc (Dalhousie)

### **Adjunct (Retired)**

**Armson, J.,** BA, MSc, PhD (Temple)

## **Master of Science (MSc) Admission Requirements/Deadline**

All applicants must possess a minimum of a baccalaureate degree from a recognized institution of higher education. An Honours degree is a strong asset.

The programs are designed for students with either minimal or no previous academic experience in the area of speech-language pathology or audiology. There are no specific prerequisite courses for admission into our programs. In most cases, however, applicants have taken courses in related areas such as psychology, linguistics, human biology, physiology, neuroscience, or other health sciences. Students whose undergraduate degree is in either speech-language pathology or audiology may be considered for entrance into the program at a more advanced level under exceptional circumstances only.

Students must have attained a minimum of a B+ average in the last two years of undergraduate work to be considered for admission. Two academic letters of recommendation and a personal statement are required as well. Applicants must indicate their preference for either audiology or speech-language pathology.

**Application deadline is January 15 for September admission.**

## Master of Science (MSc) Degree Program

The School of Communication Sciences and Disorders provides a three-year program of academic study and clinical experiences leading to a MSc degree in either speech-language pathology or audiology. Courses are normally open only to those who have been accepted as full-time students in the programs.

Students are required to attain a minimum of 72 credit hours in the Thesis Stream and 78 credit hours in the Non-Thesis Stream. Students who are interested in developing independence in conceptualizing and conducting research in communication disorders are encouraged to apply to the Thesis Stream. Application to the Thesis Stream can be made at the time of application for admission to the School or during the fall term of first year.

Extensive supervised clinical practice is required throughout the program. Much of this requirement is met by attending a 12-week practicum held during the summer between the second and third year of study and a 12-week practicum during the winter term of the third year.

## Practicum/Fieldwork Placements Outside Halifax

Students enrolled in entry-to-practice graduate programs of study in the Faculty of Health are advised that they may have to do some or all of their required clinical education/fieldwork at sites outside Halifax, and hence may have to incur additional personal expenses for travel and temporary accommodation.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

### Common Courses

While students pursue a course of study that leads to specialization in either speech-language pathology or audiology, they will be required to take courses that contain information that is basic to both professions. These courses will be described in the course listings that follow.

CMSD 5020.03: Phonetics  
CMSD 5050.03: Fundamentals of Speech Science  
CMSD 5120.03: Hearing Measurement  
CMSD 5130.03: Introduction to Audiology and Speech-Language Pathology  
CMSD 5140.03: Aural (Re)Habilitation with Children  
CMSD 5150.03: Speech-Language Acquisition  
CMSD 5260.03: Hearing Disorders  
CMSD 5290.03: Introduction to Neurosciences for Communication Disorders  
CMSD 6310.03: Audition I  
CMSD 6980.03: Research Design  
CMSD 7001.03/7002.03: Project  
CMSD 7061.03: Practicum Internship

CMSD 7062.03: Practicum Externship  
CMSD 9000.00: Thesis

### **Speech Language Pathology Courses (in addition to Common Courses)**

CMSD 5070F/W: Clinical Methods - Speech-Language Pathology  
CMSD 5250.03: Speech Disorders - Children  
CMSD 5270.03: Language Disorders in Preschool Children  
CMSD 6350.03: Assessment of Neurogenic Language and Cognitive Disorders - Adult  
CMSD 6370.03: Fluency Disorders  
CMSD 6390.03: Voice/Resonance Disorders  
CMSD 6450.03: Speech Disorders - Adults  
CMSD 6460.03: Treatment of Neurogenic Language and Cognitive Disorders - Adult  
CMSD 6470.03: Language Disorders in School Age Children  
CMSD 6490.03: Advanced Language Disorders in Children  
CMSD 6550.03: Seminar in Adult Communication Disorders  
CMSD 6611.03: Augmentative and Alternative Communication  
CMSD 6612.03: Dysphagia

### **Audiology Courses (in addition to Common Courses)**

CMSD 5071F/W: Clinical Methods - Audiology  
CMSD 5220.03: Diagnostic Audiology  
CMSD 5280.03: Audition II  
CMSD 6070.03: Topics in Audiology Procedures  
CMSD 6320.03: Pediatric Audiology  
CMSD 6360.03: Amplification  
CMSD 6380.03: Electrophysiological Audiometric Measures  
CMSD 6420.03: Advanced Diagnostic Audiology  
CMSD 6440.03: Noise in Industry and the Community  
CMSD 6560.03: Amplification II  
CMSD 6630.03: Cochlear Implants and Other Implantable Technologies  
CMSD 6640.03: Advanced Audiologic Rehabilitation

### **Interprofessional Health Education**

Students are required to maintain enrolment in IPHE 5900 for the duration of their studies. Please register in IPHE 5900.00 (section 2). Successful completion of this course is a requirement for graduation and will be recognized further with the awarding of a special Certificate in Interprofessional Collaboration to be presented by the Faculty of Health. Students are asked to consult with their individual school/college to determine the specific guidelines and expectations regarding the required portfolio.

IPHE 5900.00: Interprofessional Health Education Portfolio.

## **Course Descriptions**

### **HUCD 6370 Fluency Disorders**

CREDIT HOURS: 3

This course deals primarily with the nature and treatment of developmental stuttering. Topics include facts about its features and patterns of occurrence, theoretical perspectives concerning its nature and etiology, and treatment approaches for children and adults. The course also includes a brief overview of cluttering, psychogenic stuttering, and stuttering associated with acquired neurogenic disorders.

CROSSLISTED: HUCD 6370

RESTRICTIONS: Restricted to students admitted to School of Communication Sciences and Disorders.

### **HUCD 6700 Independent Study**

CREDIT HOURS: 3

### **HUCD 7061 Practicum Internship**

CREDIT HOURS: 3

Students are assigned supervised practicum placements on a full-time basis for a 12-week period. Placements are in facilities throughout the Atlantic Provinces.

CROSSLISTED: HUCD 7061

# Community Health and Epidemiology

Location:

Centre for Clinical Research  
5790 University Avenue

PO BOX  
Halifax NS  
B3H 1V7

Phone Number: (902) 494-3860  
Fax Number: (902) 494-1597  
Email Address: [chegrad@dal.ca](mailto:chegrad@dal.ca)  
Website: [che.medicine.dal.ca](http://che.medicine.dal.ca)

## Introduction

The Department of Community Health and Epidemiology is a research-intensive department that provides leadership in the areas of population health and patient-centered outcomes research, disease prevention, health promotion, policy development and assessment of community health service and system needs. It is part of Dalhousie's Faculty of Medicine, which has primary responsibility for training new physicians in the Maritime Provinces and is closely affiliated with major teaching hospitals. The Department includes 18 core faculty members, who have expertise in a number of disciplines including epidemiology, biostatistics, occupational/environmental health, population health, health services research, nutrition, sociology, and health informatics. They have substantial national funding from Canadian Institutes of Health Research (CIHR) as well as provincial funding from Nova Scotia Health Research Foundation (NSHRF). The Department also includes over 40 cross-appointed members drawn from a wide range of disciplines such as clinical medicine, health professions, engineering, and basic and social sciences. The Department of Community Health and Epidemiology is home to the Canadian Longitudinal Study on Aging (CLSA), the Health and Environments Research Centre (HERC), and Health Data Nova Scotia (HDNS), and many research projects. Affiliated units include the Maritime SPOR SUPPORT Unit (MSSU) and the Nova Scotia Health (NSH) Research Methods Unit (RMU).

## Staff

### Department Head

Kirkland, S.

### Graduate Coordinator

Asada, Y.

### Professors

**Allen, V.**, MD (Dalhousie), MSc (Toronto), major appointment in Department of Obstetrics and Gynaecology

**Anderson, D.**, MD, major appointment in Department of Medicine

**Asada, Y.**, BS, MS (Tsukuba), PhD (Wisconsin-Madison)

**Asbridge, M.**, BA, MA, PhD (Toronto)

**Burge, F.**, BA, MD (Queen's), CCFP, MSc (McGill), major appointment in Department of Family Medicine

**Campbell-Yeo, M.**, BN, MN (Dalhousie), PhD (McGill), RN, major appointment in Department of Nursing

**Corkum, P.**, BSc (Dalhousie), MA, PhD (OISE Toronto), major appointment in Psychology & Neuroscience

**Cox, J.**, MD, major appointment in Department of Medicine

**Dunbar, M.**, BSc, MD (Dalhousie), PhD (Lund), major appointment in Department of Surgery

**Gahagan, J.**, BA (Carleton), MA (Windsor), PhD (Wayne State), major appointment in School of Health and Human Performance

**Halperin, S.**, BSc (Stanford), MD (Cornell), major appointment in Department of Pediatrics

**Hanly, J.** MD (University College Cork), major appointment in Department of Medicine

**Kephart, G.**, BS (California), MS, PhD (Wisconsin)

**Kirk, S.**, BSc, PhD (Leeds), major appointment in School of Health Administration

**Kirkland, S.**, BSc, MSc (Waterloo), PhD (Toronto)  
**Langley, J.**, BA (Queen's), MD (Dalhousie), MSc (McMaster), major appointment in Department of Pediatrics  
**Levy, A.**, BSc, MSc, PhD (McGill)  
**Porter, G.**, BA, MD (Queen's), MSc (Alberta), FRCSC, major appointment in Department of Surgery  
**Rockwood, K.**, MPA (Queens), MD (Memorial), FRCPC, FRCP, major appointment in Department of Medicine  
**Shoveller, J.**, BSc, MA (Dalhousie), PhD (UBC)  
**Sketris, I.**, BScPhm (Toronto), MPA (Dalhousie), PharmD (Minnesota), major appointment in College of Pharmacy  
**Steenbeek, A.**, BScN (McMaster), MSc, PhD (UBC), major appointment in School of Nursing  
**Stewart, S.**, BSc (Dalhousie), PhD (McGill), major appointment in Department of Psychology  
**Whalen, A. M.**, BSc (Dalhousie), PharmD (South Carolina), major appointment in College of Pharmacy

## **Associate Professors**

**Abidi, S.**, MBBS (Karachi), MSc (Malaysia), PhD (Dalhousie)  
**Adishes, A.**, MB ChB (Liverpool), MSc, MD (Manchester), FRCP (Glasgow, London), FFOM, major appointment Dalhousie Medicine New Brunswick  
**Campbell, L. A.**, BScN (Toronto), MSc, PhD (Dalhousie)  
**Dryden, O.**, BA, MA, (York), PhD (Toronto)  
**Feng, C.**, BSc (Beijing), MSc, PhD (Simon Fraser)  
**Hajizadeh, M.**, BSc, MSc (Iran), PhD (Queensland), major appointment in School of Health Administration  
**Hayden, J. A.**, BSc (Dalhousie), DC (Canadian Memorial Chiropractic College), PhD (Toronto)  
**John Leblanc**, MSc, MD (McMaster), major appointment in Department of Pediatrics  
**Kuhle, S.**, MD (Georg-August), MPH, PhD (Alberta), major appointment in Department of Obstetrics and Gynaecology and Department of Pediatrics  
**Leblanc, J.**, MSc, MD (McMaster), major appointment in Department of Pediatrics  
**Payne, J.**, BSc, MSc (Queen's), PhD (Toronto), major appointment in Department of Diagnostic Radiology  
**Rainham, D.**, BES (Waterloo), MSc (Alberta), PhD (Ottawa), major appointment Elizabeth May Chair in Sustainability and Environmental Health, Environmental Science  
**Rao, S.**, MD (Deemed), MBA (Durham), major appointment in Department of Psychiatry  
**Travers, A.**, BSc, MD (Dalhousie), MSc (Alberta), FRCPC (EM), major appointment in Department of Emergency Medicine  
**Warner, G.**, BSc (Elmhurst), MSc, PhD (Case Western Reserve) major appointment in School of Occupational Therapy  
**Weerasinghe, S.**, BSc (Jaffna), MSc (Colombo), PhD (Dalhousie)  
**Woolcott, C.**, BSc (Waterloo), MSc (Queen's), PhD (Calgary), major appointment in Department of Obstetrics and Gynaecology, and Department of Pediatrics  
**Urquhart, R.**, MSc (Toronto), PhD (Dalhousie)

## **Assistant Professors**

**Andreou, P.**, BSc (Toronto), MA, MSc, PhD (Western)  
**Andrew, M.**, BSc (King's), MD (Dalhousie), MSc (London), PhD (Dalhousie)  
**Baskett, R.**, BA, MA (Toronto), MD, MSc (Dalhousie), major appointment in Department of Surgery  
**Cahill, L.**, BSc (Manitoba), MSc, PhD (Toronto), major appointment in Department of Medicine  
**Dutton, D.**, BAH (Queen's), MA, PhD (Calgary)  
**Herman, C.**, MD, MSc, (Dalhousie), major appointment in Department of Surgery  
**Ilie, G.**, BSc, MA (York), PhD (Toronto)  
**Johnson, P.**, MD (Dalhousie), MSc (Toronto), major appointment in Department of Surgery  
**Kim, J.**, BSc (Kangwon), MSc (Nebraska), PhD (Iowa)  
**Marshall, E.**, BA (UBC), MSc (Dalhousie), PhD (UBC), major appointment in Department of Family Medicine  
**Simms, C.**, BA (St. Mary's), MPA (Dalhousie), MHSc (Johns Hopkins), DPhil (Sussex), major appointment in School of Health Services Administration  
**Stanojevic, S.**, MSc (London School of Hygiene and Tropical Medicine), PhD (University College London)  
**Stewart, S.**, BSc (King's), MM (Waterloo), PhD (Dalhousie)  
**Top, K.**, BSc (Toronto), MD (Dalhousie), MSc (Columbia) major appointment in Department of Pediatrics Adjunct (FGS)  
**Ashley-Martin, J.**, BSc (Cornell), MSc (MGH), MSc, PhD (Dalhousie)  
**DeClercq, V.**, BSc, PhD (Manitoba)  
**Johnston, B.**, BPE (UNB), PhD (Alberta), PDF (McMaster)  
**Mclsaac, K.**, BSc (Waterloo), MSc (Queen's), PhD (Toronto)  
**Mitnitski, A.**, MSc (St. Petersburg), PhD (Leningrad Institute of Mechanical Engineering)  
**Saint-Jacques, N.**, BSc. MSc (Toronto). PhD (Dalhousie)  
**Sobolev, B.**, MMATH (Tomsk State University), PhD (USSR Academy of Sciences)

**Stock, D.**, BScH, MSc (Queen's), PhD (Toronto)  
**Yanchar, N.**, BSc, MSc (Alberta), MD (Queen's), MSc (Dalhousie)

### **Adjunct (Retired)**

**Dodds, L.**, BS (Vermont), MS (Washington), PhD (Toronto)  
**Langille, D.**, BSc (Acadia), MD (Dalhousie), MHSc (UBC)  
**MacPherson, K. M.**, BSc, MD (Dalhousie), MPH (Michigan)

## **Master of Science (MSc)**

The MSc program in Epidemiology and Applied Health Research emphasizes knowledge, analytical skills, and formal evaluative methods with application to disease prevention, health promotion, patient-centered outcomes, and assessment of health service and system needs.

### **Admission Requirements**

The typical MSc student has had undergraduate training in a scientific and/or health professional discipline and often has experience in research or other work related to health. Admission standards are consistent with those of Dalhousie University's Faculty of Graduate Studies, with the exception of higher minimum requirements for: GPA 3.3, TOEFL (iBT) 100, IELTS 7.5. Students are also required to have a recent course in basic statistics. Enrolment is limited. Limited numbers of part-time students are accepted. Selected applicants will be interviewed as part of the admissions process.

### **Application Deadline**

**October 15** (for September start of the following year) is the deadline for completed applications for those who wish to be considered for Dal scholarships or for external funding.

**January 31** (for September start) is the deadline for completed applications.

### **Curriculum**

The program requires four core courses, two selective courses, one elective course, and a thesis.

#### **CORE (required):**

CH&E 5010.03 Principles of Epidemiology and Population Health

CH&E 5019.03 Principles of Biostatistics

CH&E 6019.03 Biostatistical Modeling

CH&E 6020.03 Advanced Epidemiology

#### **SELECTIVE (choose 2 of 4):**

CH&E 5000.03 Population Health

CH&E 5040.03 Health Services Research & Policy

CH&E 6080.03 Measurement in Epidemiological Research

CH&E 6090.03 Clinical Epidemiology Research Methods

#### **ELECTIVE (choose 1):**

Can be one of the remaining selective courses

Can be one of the elective courses offered by the Department

Can be one of the graduate level electives offered by other Department (with permission of our Graduate Coordinator)

#### **Elective courses**

CH&E 6001.03 Environmental Public Health

CH&E 6003.03 Introduction to Global Health

CH&E 6010.03 Community Health Practicum

CH&E 6024.03 Methods in Clinical Trials

CH&E 6049.03 An Introduction to Systematic Review and Meta-analysis in Health Care

CH&E 6052.03 Epidemiology of Infectious Diseases

CH&E 6054.03 Use and Analysis of Secondary Data

CH&E 6060.03 Directed Readings course

The Master's thesis (CH&E 9000.00) is a major part of the MSc program. A thesis includes the design and execution of an applied research project in the field of Epidemiology and Applied Health Research. Full-time students are expected to complete the program within two years.

## Doctor of Philosophy (PhD)

PhD students in the Epidemiology and Applied Health Research program will develop deep expertise in a specialized area in one of three domains in applied health research disciplines: Epidemiology and Biostatistics; Patient and Population Health; and Health Services and Outcomes.

The program requirements include successful completion of the following:

- CH&E 8020.06 Epidemiology and Applied Health Research (six credit hours)
- Elective courses (six credit hours)
- CNLT 5000.00 Teaching & Learning in Higher Education (non-credit, pass or fail)
- CH&E 8040.00 A professional development seminar (non-credit, pass or fail)
- CH&E 8050.00 A three-month placement (non-credit, pass or fail)
- CH&E 9520.00 A comprehensive examination
- CH&E 9530.00 PhD thesis

In addition, students are encouraged to participate in teaching activities and collaborative research projects.

Students are expected to complete all the program requirements in four years as full-time students.

### PhD Admissions Requirements

PhD Admission standards are consistent with those of Dalhousie University's Faculty of Graduate Studies, with the exception of the following: a minimum A- average in a thesis-based Master's degree in epidemiology or a related discipline; successful completion of a course in advanced epidemiology (equivalent to CH&E 6020.03) and one in biostatistical modeling (equivalent to CH&E 6019.03); demonstrated research competency; confirmation from a supervisor who is willing to support the student educationally and financially (if the student does not obtain external financial support); and a minimum TOEFL (iBT) of 100, if applicable.

### PhD Application Deadline

For applicants who wish to apply for external funding and scholarships, the deadline for completed applications is September 1 of the year prior to anticipated admission. Otherwise, the deadline for completed applications is December 1 of the year prior to anticipated admission.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.



Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **CH&E 5000 Population Health**

CREDIT HOURS: 3

Why are some populations healthier than others? The course will examine this question from the population health perspective. Understanding health at the population level is an approach that seeks to improve the health of the whole population, understands health inequalities (i.e., differences in health), and identifies effective strategies for reducing and ultimately eliminating health inequities (i.e., unfair differences in health) both within and between population groups. Canada has played a leading role in the evolution of the population health perspective over the past decades. The course covers the following topics: an overview of the history of health in human populations; the evolution of the population health perspective; the measurement of population health; and theoretical and empirical investigations of multiple determinants of health. Each class composes of a lecture by the instructor and a class discussion and debate. Class participation is a critical component of this course.

PREREQUISITES: Completed or concurrently enrolled in CH&E 5010.03 Principles of Epidemiology and Population Health and CH&E 5019.03 Principles of Biostatistics

### **CH&E 5010 Principles of Epidemiology and Population Health**

CREDIT HOURS: 3

This introductory course is intended for graduate-level students with no background or formal training in epidemiology and population health. This course introduces students to the basic concepts and methods of epidemiology, with various examples from the literature examining a wide range of health outcomes (e.g., communicable, and non-communicable diseases, function, and general health status) from clinical and population health perspectives. Each class composes of a lecture and a class discussion. Active class engagement is a critical component of this course. Students are required to attend weekly Epidemiology/Biostatistics Lab.

FORMATS: Lecture | Lab

### **CH&E 5019 Principles of Biostatistics**

CREDIT HOURS: 3

This course covers essential statistical methods for medical and public health research. Topics include review of descriptive analysis techniques and basic principles of statistical inference for comparison of means and proportions. Students will carry out basic sample size calculations. Students will learn to investigate relationships between variables using both simple and multiple linear regression, as well as logistic regression. Students are required to attend weekly Epidemiology/Biostatistics Lab, where students will conduct hands-on statistical analyses.

FORMATS: Lecture | Lab

### **CH&E 5040 Introduction to Health Services Research and Policy**

CREDIT HOURS: 3

This course introduces students to basic concepts and tools in health services research important for critical evaluation of health systems and policy. The course provides an overview of the evolution and delivery, organization, and financing of health systems in Canada and explores concepts and tools used to evaluate them. In addition, the course examines current topics in health systems in Canada, such as health system financing and sustainability of health care, primary care, pharmaceutical policy, and high-cost health care users. Academic rigor and policy relevance are of primary emphasis throughout the course, and active class participation is a critical component.

PREREQUISITES: CH&E 5010 Principles of Epidemiology and Population Health and CH&E 5019 Principles of Biostatistics. Students also must have already taken, or must be concurrently enrolled in, CH&E 6020 Advanced Epidemiology and CH&E 6019 Biostatistical Modeling

### **CH&E 6001 Environ & Occupational Health**

CREDIT HOURS: 3

The main focus of this course is to guide students to understand hazard, exposure, and health outcome to navigate environmental public health. Principles and concepts underlying environments and human health comprise the major interest of this course. The nature of a variety of agents, including chemical, physical, biological, ergonomic and radiation hazards, how these agents are dispersed and transformed in the environment, the pathways of human exposure to these agents, and characterization of the health effects resulting from exposure are reviewed. The course will also discuss human environments as a determinant of health and will consider dimensions of places, spaces, and health as factors in the human environment. A case study approach will be applied throughout the course.

CROSSLISTED: ENVI 5010.03

### **CH&E 6003 Introduction to Global Health**

CREDIT HOURS: 3

This seminar provides an introduction to the interdisciplinary scope of global health, including a broad array of theoretical approaches, methodologies, and thematic areas of focus. This seminar introduces students to the basic principles of global health that are used to improve population health at all levels. The course will start with an introduction to essential concepts from public health disciplines that are the foundations of global health practice. Students will then apply these concepts to current global health challenges through course activities, assignments, and readings that will provide a real-world context. The format of inquiry will be that of a seminar wherein students review research and exchange results through analysis, discussion, and presentation. Throughout the course, students will gain critical and creative-thinking experience in applying tools and frameworks towards addressing diverse global health needs. Students will be encouraged to relate course work to their professional interests. We will use Brightspace for course information, postings, and readings. It is essential that you learn how to access material on this site and that you complete all readings required for each week. You will likely specialize for much of your degree. This course offers opportunities for you to explore, be exposed to and influenced by a range of materials and scholars in fields other than your own.

FORMATS: Seminar | Discussion

### **CH&E 6010 Community Health Practicum**

CREDIT HOURS: 3

### **CH&E 6019 Biostatistical Modeling**

CREDIT HOURS: 3

This course emphasizes mastery of advanced statistical procedures, including Poisson regression, survival analysis, generalized estimating equations, and hierarchical models. In addition to being able to carry out these analyses, students will be able to explain their assumptions, applications, and interpretation. Students are required to attend weekly Epidemiology/Biostatistics Lab.

PREREQUISITES: CH&E 5019.03, CH&E 5010.03

FORMATS: Lecture | Lab

### **CH&E 6020 Advanced Epidemiology**

CREDIT HOURS: 3

This course focuses on the design, conduct, analysis, interpretation, and communication of epidemiologic studies. The emphasis will be on non-experimental, or observational (cohort, case-control) studies. Topics for general discussion will include study designs, subject selection, measurement issues pertaining to ascertainment of exposure and outcome, design issues such as stratification and matching, and methodological issues such as confounding, effect modification, misclassification, and sources of bias. Data analyses will emphasize the practical application of statistical concepts: estimating associations and effect sizes, multivariable modelling, logistic regression, and time-to-event analysis. Additional topics will include the assessment of the totality of available data from observational studies using systematic review and meta-analysis. Students are required to attend weekly Epidemiology/Biostatistics Lab.

PREREQUISITES: CH&E 5010.03, CH&E 5019.03

FORMATS: Lecture | Lab

### **CH&E 6024 Methods in Clinical Trials**

CREDIT HOURS: 3

This course is developed for students in the graduate program of Community Health and Epidemiology who have a particular interest in randomized controlled trials (RCT's). Participants will be introduced to the practical issues in designing a controlled clinical trial by developing a clinical trial protocol throughout the course. Several designs for RCT's and Cancer clinical trials will be examined. The course will review the methods of how to analyze continuous and categorical data as well as censored data and perform interim analysis. The course will cover topics on sample size determination, Meta-Analysis and Bayesian methodology. Evaluation is based on the written protocol and statistical analysis on a simulated data set based on the written protocol.

PREREQUISITES: CH&E 5010 & CH&E 5019

### **CH&E 6042 Determinants of Health in Human Populations**

CREDIT HOURS: 3

This course will focus on health from a population and societal perspective, with an emphasis on the determinants and distribution of health in human populations. Students will be introduced to basic demographic tools and concepts useful for morbidity decline and change, the medicalization of health, and the changing institutional structure of healthcare delivery. Separate treatment will be given to determinants and consequences of health in the two settings. Population-based approaches to health policy will be explored.

PREREQUISITES: CH&E 5000.03

### **CH&E 6049 Systematic Review and Meta-analysis in Health Care**

CREDIT HOURS: 3

Systematic reviews are recognized as one of the most useful and reliable tools to help decision-makers make evidence-informed decisions. Systematic reviews attempt to provide answers to health care questions by systematically identifying, appraising, and synthesizing relevant studies using methods that limit potential bias. Widespread and growing use of systematic reviews to synthesize evidence makes it useful for health researchers and professionals to be able to understand, critique, and perform this type of research study. This course will introduce principles of evidence-informed practice and provide an overview of current systematic review methods. The course will focus on the more developed methods of systematic review/meta-analysis of randomized controlled trials for interventions, however, will address application of methods to systematic reviews of non-randomized and non-intervention studies. Specific topics will include formulating a research question for a systematic review, literature searching, critical appraisal of studies, synthesis of study results including meta-analysis, reporting and interpretation, and knowledge translation.

PREREQUISITES: CH&E 5010 & CH&E 5019

### **CH&E 6052 Epidemiology/Infectious Disease**

CREDIT HOURS: 3

Interrelated topics, crucial to understanding infectious diseases epidemiology and how epidemiology can inform our understanding of infectious diseases and its management at the individual level will be covered. These include basic microbiology, the chain of infection, disease pathogenesis, spectrum of illness associated with infectious agents, diagnostic tools, patterns of infection and disease in populations, outbreak recognition and management, infection prevention and control. The course will explore such current issues as emergence of new infections, bioterrorism, and healthcare associated infections.

PREREQUISITES: CH&E 5010.03, CH&E 5019.03

### **CH&E 6054 Secondary Data Analysis**

CREDIT HOURS: 3

This course focuses on the use of secondary data sources that are available to public health researchers in Canada. Data sources covered include Statistics Canada surveys, administrative health data, perinatal databases, and cancer registries. Data analyses will emphasize the practical application of statistical and epidemiological concepts to each data source.

PREREQUISITES: CH&E 5010.03, CH&E 5019.03, and CH&E 6019 (or concurrently registered in CH&E 6019)

### **CH&E 6060 Directed Readings/Studies I**

CREDIT HOURS: 3

### **CH&E 6062 Directed Readings/Studies II**

CREDIT HOURS: 3

### **CH&E 6080 Measurement in Epidemiological Research**

CREDIT HOURS: 3

This course will focus on methodological issues related to the measurement of exposures, outcomes, and other relevant covariates in epidemiological research. Topics to be covered include ecological perspectives in health research measurement, available measurement tools, how to design your own measures and scale development, assessment of reliability and validity, health and quality of life measures, and judging measurement quality. Students will learn how to choose an instrument when designing an epidemiological study and understand the implications of measurement error on their analyses.

PREREQUISITES: CH&E 5010.03 Principles of Epidemiology and Population Health, CH&E 5019.03 Principles of Biostatistics. Students must have already taken, or be concurrently enrolled CH&E 6020 Advanced Epidemiology and CH&E 6019 Biostatistical Modeling

### **CH&E 6090 Clinical Epidemiology Research Methods**

CREDIT HOURS: 3

Clinical epidemiology is the use of basic epidemiological principles as applied by clinicians, scientists and policymakers to inform decision-making on the diagnosis, prognosis and therapy for patients and families. This course will introduce students to the language of clinical epidemiology, the features of structured clinical questions on diagnosis, prognosis and therapy, and common study designs used in clinical epidemiology. The course will emphasize core clinical research methods used to inform clinical practice, namely randomized clinical trials, systematic reviews and meta-analysis, and clinical practice

guidelines. Students will be required to select a question of interest, consider the patient and other stakeholder perspectives, and design a fundable proposal for a pilot clinical trial, systematic review, or practice guideline. Students should prepare for the course by developing a preliminary research question that can be addressed using one of these study designs. In exploring these study designs, patient important outcomes will be emphasized, including the engagement of patients in prioritizing outcomes for research and participating in the research process from initial research stages through to the implementation of the study findings.

PREREQUISITES: CH&E 5010 Principles of Epidemiology and Population Health, CH&E 5019 Principles of Biostatistics, CH&E 6020 Advanced Epidemiology, CH&E 6019 Biostatistical Modeling

### **CH&E 6450 Economics of Health Policy**

CREDIT HOURS: 3

This course focuses on health policy themes as they relate to the current situation in the Canadian health policy arena. Themes include population health determinants, health system types, physician remuneration methods, healthcare delivery models, health production, demand for healthcare, and health system efficiency. The course is conducted in seminar style format.

CALENDAR NOTES: Students from outside of the MPA Program must seek permission from the course instructor.

CROSSLISTED: PUAD 6450.03

FORMATS: Lecture | Seminar

### **CH&E 8020 Epidemiology and Applied Health Research**

CREDIT HOURS: 6

This two-term compulsory course for the first year PhD students in the PhD Program in Epidemiology and Applied Health Research integrates three domains of epidemiologic and applied health research disciplines (epidemiology & biostatistics; patient & population health; and health services & outcomes) using a module-based, team teaching method. The course emphasizes multi- and interdisciplinary integration of knowledge, skills, and attitudes integral to all these three domains. This course offers frameworks through which students develop critical thinking in the broad epidemiologic and applied health field. The course employs seminar formats and encourages self-directed learning

FORMATS: Seminar

### **CH&E 8030 PhD Directed Studies I**

CREDIT HOURS: 3

This course is offered as an elective for students who wish to do an in-depth exploration of the literature in a specified area which falls outside of regular courses offered in the Department.

FORMATS: Discussion

### **CH&E 8032 PhD Directed Studies II**

CREDIT HOURS: 3

This course is offered as an elective for students who wish to do an in-depth exploration of the literature in a specified area which falls outside of regular courses offered in the Department.

FORMATS: Discussion

### **CH&E 8040 PhD Professional Development Seminar**

CREDIT HOURS: 0

Through a non-credit professional development seminar series in the first, second, and third year, students will enhance their professional skills, such as professionalism, project management, communication, and career planning. The seminar series consists of selected professional development seminars offered on campus as well as face-to-face "in-house" meetings.

FORMATS: Seminar

### **CH&E 8050 PhD Placement**

CREDIT HOURS: 0

Students will conduct a non-credit, three-month placement in an appropriate clinical, governmental, or non-governmental organization to experience public health, health policy, and health services delivery in action.

FORMATS: Lab

### **CH&E 9000 MSc Thesis**

CREDIT HOURS: 0

The MSc Thesis provides students with an opportunity to develop and integrate hypothesis generation, planning, analytic, writing and presentation skills. Students are encouraged to submit articles for publication, based on their thesis work.

### **CH&E 9520 PhD Comprehensive Examination**

CREDIT HOURS: 0

The comprehensive examination in the PhD program in Epidemiology & Applied Health Research provides its students with an opportunity to demonstrate that they have acquired sufficient knowledge of the field of epidemiology and applied health research as well as the ability to integrate that knowledge in order to be permitted to conduct a PhD thesis.

### **CH&E 9530 PhD Thesis**

CREDIT HOURS: 0

The PhD thesis provides students with the opportunity to develop substantial depth of knowledge, critical and original thinking related to a particular content or methodological area, as well as expertise in developing research proposals, conducting/managing research and communicating research results. A PhD thesis must represent an original contribution to the field of learning in the subject.

PREREQUISITES: CH&E 9520.00

FORMATS: Other (explain in comments)

## **Computational Biology and Bioinformatics**

Location:

Goldberg Computer Science Building  
6050 University Avenue

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2740

Fax Number: (902) 494-1517

Email Address: [cbbi@dal.ca](mailto:cbbi@dal.ca)

Website: [www.bioinformatics.dal.ca](http://www.bioinformatics.dal.ca)

## **Staff**

### **Graduate Coordinator**

**Beiko, R.**, Computer Science

### **Faculty**

**Archibald, J. M.**, Biochemistry and Molecular Biology

**Beiko, R.**, Computer Science

**Bielawski, J. P.**, Biology, Mathematics and Statistics

**Blouin, C.**, Computer Science, Biochemistry and Molecular Biology

**Gu, H.**, Mathematics and Statistics

**Herbinger, C. M.**, Biology, Mathematics and Statistics

**Roger, A. J.**, Biochemistry and Molecular Biology

**Susko, E.**, Mathematics and Statistics

### **Adjunct (FGS)**

**Field, C.**, Emeritus, Mathematics and Statistics

## **Application and Admission**

Candidates for admission to the masters of computational biology and bioinformatics should hold an honours degree, or equivalent, from a university of recognized standing in any relevant discipline. Relevant disciplines are typically: Biology, Biochemistry and

Molecular Biology, Computer Science, Mathematics, Physics and Statistics. Students from any background will be considered on an individual basis. All candidates must meet the requirements of the Faculty of Graduate Studies.

Prior to applying, a candidate must find a suitable supervisor or co-supervisors. A statement of research interests must be submitted with the application forms that can be obtained from the Registrar's office. The statement may be prepared in conjunction with the supervisor(s) and should include a general statement of the biological areas of interest, possible computational methodologies relevant to the problem, and a statement on the candidate's background. This document is used to evaluate whether suitable academic activities will allow the candidate to meet the program requirements.

All material should be submitted by the strict deadline of April 1st for overseas applicants and June 1st for North American applicants.

Candidates from outside Canada whose native language is not English must demonstrate their capacity to pursue a master's program in English. Results of a TOEFL or other Standard English competency test should be submitted at the time of application. The minimum TOEFL score required is 580 (computerized TOEFL score required is 237).

## Administration

The Executive committee is comprised of at least one representative from the following academic units:

1. Biochemistry and Molecular Biology
2. Biology and Marine Biology
3. Computer Science
4. Mathematics and Statistics

The Executive committee also acts as Admission committee while administrative support will be provided by the Faculty of Computer Science. All communication with the program should be done directly to the Graduate Coordinator.

## Program Requirements

Candidates for the Master's degree in Computational Biology and Bioinformatics are expected to complete four 0.5 credit courses and two credited seminar courses. The course selection must be made to further the candidate's existing strengths, and to provide the necessary background to successfully meet the thesis requirements.

The thesis must be reviewed by the supervisor(s) and up to two readers to meet the breadth requirement. These requirement states that:

1. at least one of the readers evaluate the biological aspect of the research project and hails from a biological background (including, but not limited to, Biology and Biochemistry);
2. at least one of the readers evaluate the contribution of the thesis in either Mathematics, Statistics or Computer Science.

The candidate also must demonstrate a general grasp of current bioinformatics issues and methodologies.

## Master of Science (MSc)

The program is an interdisciplinary master's degree with an emphasis on thesis work which focuses on tackling problems in biology, molecular biology, and health-related fields through significant research contributions in mathematics, statistics and computer science.

This program is set within the framework of current interdisciplinary research conducted within Dalhousie. Students in this program will join a community of researchers in the fields of computational biology and bioinformatics. Resources from the Faculty of Computer Science, Medicine and Science are coordinated to offer a flexible program, with a limited course load and an emphasis on research activities. Students from a broad selection of backgrounds are invited to consider the program. Each candidate is supervised within the research group of their supervisor from the beginning of their tenure.

The program is available on a full-time basis. The only pre-specified course requirement is the program seminar series; however, a selection of specialized courses is usually required by the Admission committee. The specifics of course selection are made on an individual basis in coordination with the candidate, the supervisor(s), and the admission committee.

An admissible research topic must include relevant work on a current biological problem through innovative methodology in Mathematics, Statistics or Computer Science.

## Courses

The course selection will be determined on an individual basis. Any acceptable graduate courses can be selected, as explained in section B. The following courses are specific to the program and are designed to bring students from different backgrounds to a common level. Contact the Graduate Coordinator for further details.

### Computer Science

CSCI 6801.03: Computational Biology and Bioinformatics

CSCI 6802.03: Algorithms in Bioinformatics

### Biochemistry and Molecular Biology

BIOC 5010.03: Bioinformatics

### Mathematics and Statistics

STAT 5620.03: Statistical Issues in Molecular Evolution

## Computer Science

Location:

Goldberg Computer Science Building  
6050 University Avenue

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2093

Fax Number: (902) 492-1517

Email Address: [grad@cs.dal.ca](mailto:grad@cs.dal.ca)

Website: [www.cs.dal.ca](http://www.cs.dal.ca)

## Introduction

The Faculty of Computer Science offers both masters and doctoral degree programs. The Masters program is available either with a traditional research-oriented thesis option, or with a project option and more courses designed for students interested in an advanced professional degree. Research in the Faculty has an interdisciplinary approach and addresses a number of areas. Please see the Faculty website for information on these research areas. There are approximately 30 full-time professors in the Faculty, and approximately 200 students registered in the masters and doctoral programs.

The Faculty of Computer Science has a permanent home in the award-winning Goldberg Computer Science Building completed in the autumn of 1999, and the top floor of the Mona Campbell Building. Graduate computing facilities include networks of Unix workstations, Windows PCs, and Macintosh computers, as well as large scale servers and massive data storage facilities. The faculty also has access to high performance computing facilities. The Faculty's Network Performance Lab is equipped with network testing software, routers, and switches for developing secure virtual private networks. The Computer Graphics and Visualization Lab houses graphics workstations as well as specialized equipment, such as a laser scanner and eye tracking hardware. The Electronic Commerce Lab utilizes award winning e-business software to research new concepts in online commerce and web services. The faculty's research in semantic web-based approaches to clinical decision support systems is at the cutting edge of both health informatics and semantic web research. The Faculty of Computer Science building houses a fast, secure, fully switched network, in addition to being fully wireless. Gigabit ethernet serves as the backbone of the network with a connection to CA\*net3, the world's first national optical R&D network.

The Institute for Big Data Analytics is housed in the Faculty of Computer Science, where it serves as a centre of excellence both nationally and internationally in the field of Big Data Analytics. Directed by Dr. Stan Matwin CRC, the Institute coordinates and participates in a wide range of research projects involving students, faculty and industrial and governmental partners as well as presenting a program of guest seminars and training courses. From fall 2014 onwards the Institute is offering a limited number of MSc and PhD scholarships funded by the NSERC CREATE initiative. Further details can be found on the Institute's website [www.bigdata.cs.dal.ca](http://www.bigdata.cs.dal.ca).

**NOTE:** Completion of any or all software engineering courses offered by the Faculty of Computer Science does not qualify persons to hold the designation “Professional Engineer” as defined by various Provincial Acts governing the Engineering Profession.

**The most up-to-date information on our graduate programs, admission requirements, academic regulations, graduate courses, and research activities is available on the following website: <http://www.cs.dal.ca> (programs, graduate).**

## Staff

### Dean

**Rau-Chaplin, A.**, BSc (York), MSc, PhD (Carleton), High Performance Computing, Parallel Algorithms, Data Mining & Warehousing, and Risk Analytics

### Associate Deans

**Beiko, R. G.**, BSc (Dalhousie), PhD (Ottawa), Computational biology, Graph algorithms, Machine learning, Evolutionary algorithms, High-performance computing

**Blouin, C.**, BSc (Laval), PhD (Dalhousie), Protein evolution and biophysics, Algorithms, Biogenetics, High-performance computing, Statistical mechanics, Molecular modeling

### Graduate Administrators

**Cheng, D.**

Telephone (902) 717-3232, Email: [dennis.cheng@dal.ca](mailto:dennis.cheng@dal.ca)

**Ramamoorthy, V.**

Telephone (902) 494-1798, Email: [vidhya.ramamoorthy@cs.dal.ca](mailto:vidhya.ramamoorthy@cs.dal.ca)

**Teferra, M.**

Telephone (902) 494-6438, Email: [menen@cs.dal.ca](mailto:menen@cs.dal.ca)

### Professor Emeritus

**Shepherd, M. A.**, MSc, PhD (Western), Hypertext, Information retrieval, Web information systems, Electronic news, Information filtering, Health informatics

**Slonim, J.**, BSc (UBC), MSc (Western), PhD (Kansas), Electronic Commerce, Software Engineering Databases, Distributed Databases, Software Testing, Transaction Management, Software Architecture

### Professors

**Abidi, S.**, BEng (NED, Eng and Tech), MSc (Miami), PhD (Surrey), Knowledge management, Artificial Intelligence, Medical Informatics, Knowledge discovery and data mining, Neural Networks, Enterprise Information Systems

**Arnold, D.**, Diploma (Dortmund), MSc (Simon Fraser), PhD (Dortmund), Evolutionary computation, Optimization

**Beiko, R. G.**, BSc (Dalhousie), PhD (Ottawa), Computational biology, Graph algorithms, Machine learning, Evolutionary algorithms, High-performance computing

**Blouin, C.**, BSc (Laval), PhD (Dalhousie), Protein evolution and biophysics, Algorithms, Phylogenetics, High-performance computing, Statistical mechanics, Molecular modeling

**Bodorik, P.**, BSc (Calgary), MEng, PhD (Carleton), Databases and Distributed databases, Architectural support for operating systems

**Brooks, S.**, BSc (Brock), MSc (UBC), PhD (Cambridge), Computer graphics, image editing and visualization

**Heywood, M.**, BEng (Plymouth), PhD (Essex), Genetic programming; Classification; Reinforcement learning, Evolutionary gaming

**Keselj, V.**, BSc (Belgrade), MSc, PhD (Waterloo), Natural language processing, Text mining, Information retrieval, Multiagent systems, Algorithmic number theory

**Matwin, S.**, MSc, PhD (Warsaw), DSc (Pol Acad of Sci), Machine learning, Data mining, Text mining

**Milios, E.**, Dipl Eng (NTUA), SM, EE, PhD (MIT), Networked information spaces, Machine learning, Text mining, Visual text analytics

**Ralph, P.**, BComm, BSc (Memorial), PhD (UBC), Software engineering, Human-computer interaction, Agile methods, Human-centred design, Game development, Software design, Research methods, Qualitative methods

**Sampalli, S.**, BEng (Bangalore), PhD (Indian Institute of Science), Network security, High-performance routing and switching, Hybrid (wireless and optical) networks design, Active networks, Secure grid computing



**Torgo, L.**, PhD (Porto), Machine learning, Utility-based predictive analytics, Time series forecasting, Spatial & spatiotemporal analytics

**Trappenberg, T.**, MSc, PhD (RWTH Aachen), Computational neuroscience, Machine learning, Hierarchical temporal memory; Reinforcement learning; Self-organizing maps; Dynamic neural field theory; Classification and modeling, Learning and memory

**Watters, C. R.**, BSc, MSc, MLS (Western), PhD (TUNS), Information retrieval, Web information systems, Virtual documents, Hypertext

**Zeh, N.**, MCS (Dipl-Inf) (Friedrich-Schiller-Universitaet Jena), PhD (Carleton), Algorithms and data structures, I/O-efficient and cache-oblivious algorithms, Parallel algorithms, Graph algorithms, Computational geometry

**Zincir-Heywood, A. N.**, BSc, MSc, PhD (Ege Univ), Network security, Network management and Network information retrieval

### Associate Professors

**Blustein, J.**, BSc, MSc, PhD (Western), Hypertext and digital libraries, Human-computer interaction, Postcolonial computing

**Gagie, T.**, BSc (Queen's), MSc (Toronto), Dr rer nat (Bielefeld), Algorithms and data structures, Bioinformatics, Data compression

**He, M.**, BEng (Nanjing P&T), MMath, PhD (Waterloo), Algorithms and data structures, Computational geometry

**McAllister, M.**, BMath (Waterloo), MS, PhD (UBC)

**Oore, S.**, BSc Hon (Dalhousie), MSc, PhD (Toronto), Machine learning, Deep learning, Computational creativity, Neural networks

**Orji, R.**, BSc (UNIZIK), MSc (METU), PhD (Saskatchewan), Human-computer interaction, persuasive technology, Behaviour change systems, Games for change, Personalized and adaptive systems, Human-computer interaction for health, Human-computer interaction for development

**Paulovich, F.**, BSc, MSc (Sao Carlos), PhD (Sao Paulo), Information visualization, Visual analytics, Visual data mining, Machine learning, Data mining

**Reilly, D.**, BA Hons (McGill), BEd (Queen's), PhD (Dalhousie), Ubiquitous computing, Collaborative technology, Information visualization, Mixed reality, Human-computer interaction

**Ye, Q.**, BEng, MEng (Harbin), PhD (Alberta), Mobile and wireless networks, Internet of things, Network security, Cloud computing, Data Analytics

### Assistant Professors

**Haque, I.**, PhD (Alberta), Network design and optimization, Software devine networking, Internet of things, Cyber physical system

**Hernandez-Castillo, C.**, BSc, MSc, PhD (Veracruzana), Neuroscience, Artificial intelligence

**Malloch, J.**, BA (Dalhousie), MA, PhD (McGill), Human computer interaction

**Poitras, E.**, BA (Moncton), MA, PhD (McGill), Adaptive instructional systems and technologies, Immersive reality for mobile and wearable devices, Educational data mining and learning analytics, Self-regulated learning, Computer science education

**Rahman, M.**, BSc (Bangladesh), MSc, PhD (Saskatchewan), Software Engineering

**Whidden, C.**, BCS, MCS, PhD (Dalhousie), Algorithms, Bioinformatics, Combinatorics, Deep learning, Graph theory, Lateral gene transfer, Microbial communities, Oceans, Human microbiome, Phylogenetics

### University Teaching Fellows

**Brodsky, A.**, BMath (Waterloo), MSc, PhD (UBC)

### Senior Instructors

**Aziz, K.**, BSc (UET Lahore), MSc (NUS), PhD (TU Wien)

**Kalyaniwalla, N.**, BSc (Xavier's), MS, PhD (RPI)

**MacKay, B.**, BA (Mt. Allison), BTHMgmt (MSVU), PhD (Dalhousie)

**Sampangi, R.**, BEng (NIE), MTech (UOM), PhD (Dalhousie)

**Siegel, A.**, BSc (Eckerd), MSc, PhD (Dalhousie)

### Instructors

**DeGagne, C.**, BSc (Brandon), MSc (Bristol), PhD (Dalhousie)

**Hawkey, K.**, BCS, PhD (Dalhousie)

**Hawkey, R.**, BCS (Dalhousie)

### Adjunct (FGS)

**Abusharekh, A.**, BSc (Al-Azhar), MSc, PhD (George Mason), Computer networks and network traffic analysis, attributed and concurrent programming, Service-Oriented computing, discrete event simulation, Big Data analytics

**Bellinger, C.**, BCS, MCS (Carleton), PhD (Ottawa), Machine learning, Data analysis, Data mining

**Brown, C.**, BSc, (Reading), PhD (Portsmouth), Benthic ecosystems  
**Gao, Q.**, BEng (Xi'an Jiaotong), MAS, PhD (Waterloo), Pattern analysis and machine intelligence, Computer vision and augmented reality, Data mining and data warehouses, Cloud computing, Internet of things  
**Hessler, I.**, BSc, MSc (FU Berlin), PhD (Bremen)  
**Kirsebom, O.**, BSc, PhD (Aarhus), Nuclear astrophysics  
**Lucic, V.**, Dipl. Ing. E. Eng. (Univ Nis), MSc, PhD (Waterloo), stochastic analysis and optimal control, application of statistical and econometric methods in financial prediction  
**Makanju, Tokunbo**, BSc (Lagos), MCS, PhD (Dalhousie)  
**McAllister, T.**, BSc, MSc (Alberta), PhD (Guelph)  
**Sherkat, E.**, BSCE (Isfahan), MSC (Tehran), PhD (Dalhousie)  
**Shepherd, M. A.**, MSc, PhD (Western), Hypertext, Information Retrieval, Web Information Systems, Electronic News, Information Filtering, Health Informatics  
**Soares, A.**, BCS, MCS (Paraiba), PhD (Pernambuco), Spatiotemporal data enrichment, Segmentation, Classification, Clustering, Visualization  
**Van Woensel, W.**, BSc, MSc, PhD (FU Brussels), Health informatics, mobile computing, Knowledge representation and reasoning

## Cross Appointments

**Abidi, S.**, MBBS (Karachi), MSc (Sains Malaysia), PhD (Dalhousie), Health Knowledge Management, Critical Decision Support, Health Knowledge Modeling and Computerization, Patient-Centered Care, Comorbid Care Planning, Knowledge Translation, Health Information Systems, Evaluation of Health Information Systems  
**Janssen, J.**, MSc (Eindhoven), PhD (Lehigh), Analysis and modelling of self-organizing networks, combinatorial optimization  
**Klein, R.**, BA (SUNY), MA, PhD (Oregon), Human perception, attention, cognition and performance; Cognitive neuroscience; Applied cognitive psychology. Visual attention and its disorders; Reading and dyslexia; Eyewitness testimony, human factors, performance rhythms, counterfeit detection, problem gambling  
**Sampalli, T.**, BEng (Bangalore), MSc, PhD, (Dalhousie)  
**Selinger, P.**, PhD (Univ Pennsylvania), Mathematics and Statistics. Semantics of programming languages; Quantum computing  
**Seto, M.**, BSc, MSc, PhD (UBC), PEng  
**Smit, M.**, BSc, MCS, (Hons) (Dalhousie), PhD (Alberta), cloud computing, tool support for research dissemination, discovery in research communities, management of cloud-scale data, enabling open information  
**Wach, G.**, BA (Hons) (UWO), MSc (South Carolina), PhD (Oxford), Earth Sciences

## Graduate Degree Programs

Please consult the Faculty of Computer Science website at [www.cs.dal.ca/](http://www.cs.dal.ca/) for information concerning updates to the regulations.

## Master of Applied Computer Science (MACSc)

### Introduction

The Master of Applied Computer Science (MACS) is a 16-month graduate degree that prepares students for dynamic careers in the software industry. Students develop their technical skills through core courses in systems, communications, and data management.

Students apply what they have learnt in a paid industrial internship, entrepreneurship work term, or research project. The program is also open to students with a STEM undergraduate degree outside of computer science and engineering who complete a two-term preparatory program in software development.

Visit the MACS website at [www.dal.ca/macsc](http://www.dal.ca/macsc) for a complete program description and for information concerning updates to the program's regulations and course offerings. Email queries must be addressed to [graduate@cs.dal.ca](mailto:graduate@cs.dal.ca).

### Admission Requirements

Students entering this program must have the equivalent of a four-year undergraduate university degree, a minimum Grade Point Average (GPA) of 3.0, and meet the following program-specific admission requirements:

- If applying from a non-Computer Science background, qualifying year courses may be necessary, and a list of courses will be specified in the letter of offer.

- Non-Canadian applicants whose first language is not English require a TOEFL score of at least 92 (IBT) or IELTS score of 7.0.
- Applicants are required to complete, and pass, an admissions interview. More information about the interview is available at <https://www.dal.ca/academics/programs/graduate/applied-computer-science/admissions/macs-admission-interview.html>
- *Please note:* The MACS program does not accept students for the summer term. Applicants should follow the application deadlines for September and January.
- Admission into the MACS program is competitive. Thus, meeting these requirements does not guarantee admission.

### English Language Proficiency Requirement

Information pertaining to the English language proficiency requirement is given in the [Faculty of Graduate Studies Regulations](#). Both TOEFL and IELTS results are accepted as proof of English language proficiency. For admission into graduate programs in Computer Science, a score of at least 92 on the internet based TOEFL test or at least 7.0 on the IELTS test is required.

### Information and Application Forms

For further information, please visit <https://www.dal.ca/faculty/computerscience/graduate-programs/grad-handbook/how-to-apply.html>

### Registration Requirement and Duration of Studies

A student is required to register each academic term to maintain eligibility to continue in the program. Student who enter the program meeting normal admission requirements may be able to complete the program requirements in 16 months. For information on maximum time limits for completion of program requirements, leaves of absence, and extensions, see the [Faculty of Graduate Studies Regulations](#) in this calendar.

### Program Requirements

For full-time students, the Master of Applied Computer Science (MACS) program takes about 16 months to complete, i.e., three (3) academic terms with a total of (30) credit hours (24 to 27 credit hours of courses followed by either a (3) credit hour industrial or entrepreneurial internship or a (6) credit hour project, depending on the selected stream). Students from a non-Computer Science background may be assigned additional qualifying year courses, which could add up to one (1) additional year to the program.

All students must complete the following (9) credit hours of core courses.

- CSCI 5100.03: Communication Skills
- CSCI 5308.03: Advanced Topics in Software Development
- CSCI 5408.03: Data Management, Warehousing, Analytics

All students must complete (12) credit hours from the following list of 5000-level electives. Please note that this is not a comprehensive list and will include other 5000-level courses as they are developed.

- CSCI 5001.03: Privacy & IT
- CSCI 5193.03: Technology Innovation
- CSCI 5306.03: Applied Program Comprehension
- CSCI 5409.03: Advanced Topics in Cloud Computing
- CSCI 5410.03: Serverless Data Processing
- CSCI 5601.03: Designing for User Experience
- CSCI 5708.03: Mobile Computing
- CSCI 5709.03: Advanced Topics in Web Development
- CSCI 5901.03: Special Graduate Topics in Applied Computer Science
- CSCI 5902.03: Special Graduate Topics in Applied Computer Science

Additional requirements are stream-dependent, with students required to complete the following components:

- **Internship stream:** (6) credit hours of additional CSCI electives from the 5000 or 6000 level, CSCI 9890 Internship Preparation, and the CSCI 9100.03 Industrial Internship

- **Entrepreneurship stream:** (6) credit hours of BUSI electives from the approved list, and the CSCI 9200.03 Entrepreneurial Internship
- **Project stream:** (3) credit hours of additional CSCI electives from the 5000 or 6000 level, and the CSCI 9301.03 and CSCI 9302.03 research projects.

For the (6) credit hours of BUSI electives required in the Entrepreneurial Stream, the following courses are currently approved:

- BUSI 5902.03: Starting Lean
- BUSI 6002.03: New Venture Creation
- BUSI 6007.03: Innovation Management
- 2 x BUSI courses (3 credit hours per course) offered as part of CDL (Creative Destruction Lab) Atlantic program. The courses that are part of the CDL-Atlantic program will be available as an option only for MACS students being admitted in September. The CDL-Atlantic program uses a competition-based model for accepting students into the program and entry is not guaranteed.

### Program Sequencing

The structure of each term of the program will depend on the stream chosen by the student, since there are stream-specific courses that would need to be taken when they are offered and in a specific sequence. The course sequence for each stream is summarized below.

It is recommended that students meet with an academic advisor (email [graduate@cs.dal.ca](mailto:graduate@cs.dal.ca)) to plan their courses based on interests, course availability and program requirements, both prior to beginning the program, and throughout their studies.

### ALL STREAMS

#### Term 1

Full-time students, ***who have NOT been assigned the undergraduate pre-requisite course***, are expected to take the following three (3) courses during the first academic term of the program:

- CSCI 5100: Communication Skills
- CSCI 5308: Advanced Topics in Software Development
- CSCI 5408: Data Management, Warehousing, Analytics

Full-time students, ***who have been assigned the undergraduate pre-requisite course***, are expected to take the following two (2) courses during the first academic term of the program:

- CSCI 5100: Communication Skills
- CSCI 3901: Software Development Concepts

### INTERNSHIP STREAM

#### Term 1

- See All Streams sequencing
- If students would like to go on internship in the 3<sup>rd</sup> term and return for an academic term following internship, they may need to take CSCI 9890 Internship Preparation course during term 1 as well. It is recommended that interested students consult advisors at the co-op office for details.

#### Term 2

- Three (3) courses from the list of approved CSCI 5000-level electives.
- CSCI 9890 Internship Preparation course as they prepare for an internship in Term 4

#### Term 3

- One (1) course from the list of approved CSCI 5000-level electives.

- Two (2) additional courses from CSCI 5000 or 6000 level electives

#### **Term 4**

- Students are expected to be on their Industrial Internship (CSCI 9100).

### **ENTREPRENEURSHIP STREAM**

#### **Term 1**

- See All Streams sequencing
- Students in the Entrepreneurship Stream may need to take one of the graduate business (BUSI) courses that may be offered during this term.

#### **Term 2**

- Three (3) courses from the list of approved CSCI 5000-level electives
- One (1) graduate business (BUSI) course from those offered this term

#### **Term 3**

- One (1) course from the list of approved CSCI 5000-level electives.
- Complete any remaining BUSI courses to be eligible for the internship.

#### **Term 4**

- Students are expected to be on their Entrepreneurial Internship (CSCI 9200).

### **PROJECT STREAM**

#### **Term 1**

- See All Streams sequencing

#### **Term 2**

- Three (3) courses from the list of approved CSCI 5000-level electives

#### **Term 3**

- One (1) course from the list of approved CSCI 5000-level electives.
- Two (2) additional courses from CSCI 5000 or 6000 level electives
- Additionally, project stream students are expected to start working on their project and may choose to register in CSCI 9301.

#### **Term 4**

- Students are expected to complete their project (CSCI 9301 if not previously taken, and CSCI 9302).

## **Master of Computer Science (MCS)**

### **Admission Requirements**

To be admitted to the Master Computer Science (MCS) program all students must have completed a four-year undergraduate program in Computer Science with high standing. Their Computer Science background must be at least equivalent to that covered by

the core courses in the Dalhousie Bachelor of Computer Science program. Students who do not meet these requirements may be admitted with a requirement to complete specific undergraduate courses in addition to their graduate program requirements to make up for deficiencies in their background.

## English Language Proficiency Requirement

Information pertaining to the English language proficiency requirement is given in the [Faculty of Graduate Studies Regulations](#). Both TOEFL and IELTS results are accepted as proof of English language proficiency. For admission into graduate programs in Computer Science a score of at least 580 on the written TOEFL test, a 92 on the internet-based test, or at least 7.0 on the IELTS test is required.

## Information and Application Forms

For further information please visit [www.dal.ca/faculty/computerscience/programs/graduate/master-of-computer-science.html](http://www.dal.ca/faculty/computerscience/programs/graduate/master-of-computer-science.html) or contact the Chair of the Computer Science Graduate Committee at (902) 494-6438. Applications are to be submitted electronically. Please follow the application instructions at [www.dal.ca/faculty/computerscience/programs/graduate/advising\\_resources/graduate-admission-procedure.html](http://www.dal.ca/faculty/computerscience/programs/graduate/advising_resources/graduate-admission-procedure.html).

## Academic Regulations

### Program Requirements

The requirements for a MSc degree consist of not less than 12 credit hours and a thesis selected upon the advice of the thesis supervisor. The thesis is equivalent to 18 credit hours.

The thesis shall be written under the guidance of a thesis supervisor and must be satisfactory to an examining committee established by the Faculty. The candidate must present an oral thesis defence.

### Registration Requirement and Duration of Studies

A student is required to register each academic term to maintain eligibility to continue in the program. Students who enter the program meeting normal admission requirements may be able to complete the requirements in 16 months. For information on maximum time limits for completion of program requirements, leaves of absence, and extensions, see the [Faculty of Graduate Studies Regulations](#) in this calendar.

## Master of Electronic Commerce (MEC)

The Faculty of Computer Science in partnership with the Faculties of Management and Law offer the degree of Master of Electronic Commerce.

Electronic Commerce is a discipline whose underpinnings lie equally in technology, business, and social and economic policy. Distinct from any of the disciplines that comprise it, this multi-disciplinary two-year program consists of core courses, stream courses, an industrial internship, and a project. Students study core topics in each of the three areas and concentrate in depth in one of them by choosing one of three streams of study: Technology, Business and Policy.

The program may also offer the student an opportunity for study abroad at other member universities of an international consortium mandated and endorsed by the G7 to develop a Global Master of Electronic Commerce. The core of this program is intended to be common throughout the consortium with institutions offering courses outside the core, according to their individual strengths. Dalhousie University is the only Canadian participant in this international consortium.

For a complete description of this program please see the [Electronic Commerce](#) entry in this calendar. Please also visit the program's website at [www.ecomm.dal.ca](http://www.ecomm.dal.ca) for information concerning updates to the program's regulations and course offerings. Email queries to can be addressed to [mec@cs.dal.ca](mailto:mec@cs.dal.ca).

## Master of Health Informatics (MHI)

The Faculty of Computer Science, in partnership with the Faculty of Medicine, offers the degree of Master of Health Informatics.

Health Informatics studies the use of computing and information technology in health research, education, patient care, policy setting and health administration. This interdisciplinary program draws on resources across the University, including faculty and courses from the Faculties of Computer Science, Medicine, Management, and Health Professions.

For a complete description of this program, please see the [Health Informatics](#) entry in this calendar. Please also visit the program website at [www.healthinformatics.dal.ca/](http://www.healthinformatics.dal.ca/) for more information.

Email queries can be addressed to [hinf@cs.dal.ca](mailto:hinf@cs.dal.ca).

## Master of Science (MSc) in Computational Biology and Bioinformatics

The program is an interdisciplinary master's degree with an emphasis on thesis work which focuses on tackling problems in biology, molecular biology, and health-science related fields through significant research contributions in mathematics, statistics, and computer science. This program is set within the framework of current interdisciplinary research conducted within Dalhousie. Students in this program will join a community of researchers in the fields of computational biology and bioinformatics.

Resources from the faculties of Computer Science, Medicine and Science are coordinated to offer a flexible program, with a limited course load and an emphasis on research activities. Students from a broad selection of backgrounds are invited to consider the program. Each candidate is supervised within the research group of their supervisor from the beginning of their tenure.

## Doctor of Philosophy (PhD)

### Admission Requirements

To be admitted, students must have completed a research (thesis) Master's degree program in Computer Science, or equivalent and must meet the admission requirements of the Faculty of Graduate Studies. In exceptional circumstances, a student may be admitted into the MSc (Thesis) program with the possibility of transferring to the doctoral program within the first 15 months (subject to approval of the Graduate committee and the Faculty of Graduate Studies). Students with an honours Bachelor's degree and strong promise in research may be admitted into the post-Bachelor PhD program.

### English Language Proficiency Requirement

Information pertaining to the English language proficiency requirement is given in the [Faculty of Graduate Studies Regulations](#). For admission into graduate programs in the Faculty of Computer Science those students who must supply a TOEFL, must obtain a score of at least 580 on the written TOEFL examination, 92 on the internet-based test, or 237 on the computer-based exam.

### Information and Application Forms

For further information visit [www.cs.dal.ca/](http://www.cs.dal.ca/) or contact the Chair of the Computer Science Graduate Committee at (902) 494-6438.

Application forms may be obtained from:

Registrar's Office  
Dalhousie University  
PO Box 15000  
Halifax, NS B3H 4R2 Canada

or on the web at [www.dal.ca/apps](http://www.dal.ca/apps)

To hold your seat in the program for which you were admitted, we require a non-refundable \$250 deposit (to be paid to Student Accounts) a full 30 days in advance of the starting date for the term of admittance. The \$250 deposit will be applied towards your tuition.

## Digital Innovation

Location:  
Goldberg Computer Science Building  
6050 University Avenue

PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-2740

Fax Number: (902) 492-1517  
Email Address: [graduate@cs.dal.ca](mailto:graduate@cs.dal.ca)  
Website: <https://www.dal.ca/digitalinnovation>

## Introduction

Today's rapidly changing digital landscape is changing the way industries and entire systems work, even those that have not been traditionally viewed as "digital". From healthcare and banking to fisheries and oceans, companies across all industries and sectors are looking for leaders with the technical and business knowledge to help them manage change and identify opportunities in the face of digital innovation.

The Master of Digital Innovation (MDI) is a customizable interdisciplinary program where students gain the knowledge and experience, they need to enter a digital management career. Curriculum is delivered by experts from the Faculties of Computer Science, Management, Law, and Medicine.

Students can customize their program with certificate, work term and thesis options. Certificates provide a distinct set of skills and knowledge to meet educational and career objectives. There are currently two certificate options in digital business and health informatics.

## Please send Graduate Application Documents to:

### Graduate Admissions and Recruitment

6050 University Avenue, Room 106  
PO Box 15000  
Halifax, NS B3H 4R2 Canada

## Staff

### Program Director

**Keselj, V.**, BSc (Belgrade), MMath, PhD (Waterloo)

### Faculty

**Abidi, S. R.**, MBBS (Karachi), MSc (Malaysia), PhD (Dalhousie)  
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**Beaubien, L.**, BA, BSc (Dalhousie), MBA (St. Mary's), PhD (Western)  
**Bodorik, P.**, BSc (Calgary), MEng, PhD (Carleton)  
**Conrad, C.**, BA (Dalhousie), MA (Queen's), MEC (Dalhousie)  
**Deturbide, M.**, BSc (Dalhousie), BJ (King's), LLB, LLM (Dalhousie)  
**Guibault, L.**, LLB, LLM (Montreal), PhD (Amsterdam)  
**Hawkey, K.**, BCSc, PhD (Dalhousie)  
**Lee, K.**, BSc, MBA (Yonsei), MBA (Ottawa), PhD (McGill)  
**Marchand, Y.**, MCS, D.E.A. (Caen), PhD (Campiegne)  
**Mosquera, G.**, BIT (Clayton State), MEC (Dalhousie)  
**Penney, J.**, BA, JD (Dalhousie), MSt (Oxford), LLM (Columbia), PhD (Oxford)  
**Smit, M.**, BCSc, MSc (Dalhousie), PhD (Alberta), PDF (York)  
**Stewart, S.**, BSc (King's), MMath (Waterloo), PhD (Dalhousie)

## Admission Requirements

As this program is fundamentally interdisciplinary, it seeks to educate and train students at the intersection of computing, business and domain knowledge. As such, the program will be open to a wide range of students who hold an undergraduate degree in computer science, business, or a discipline related to the domains in question. Students with undergraduate degrees related to domains that are undergoing digital innovation, such as healthcare, government etc. would also be considered as ideal candidates for this program.

The general admission requirements for the program are the same as existing graduate programs at Dalhousie University. For more information visit [https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission\\_requirements.html](https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission_requirements.html).



## Program Outline

Most full-time students will take 4 terms to complete the Master of Digital Innovation in the following sequence. If opting to take a certificate, students must meet requirements for the certificate through elective options. Working with an advisor, students will select electives to achieve their professional goals and educational aims. This will happen at any point between admission to the program and beginning their studies.

### ***Term 1***

Two of the following:

DGIN 5100.03 Foundations in Web Technologies  
DGIN 5200.03 Foundations in Business  
DGIN 5300.03 Law, Policy, and Ethics in Emerging Technologies  
DGIN 5400.03 Statistics for Health Informatics

+ One elective (3 credit hours) approved by a program advisor

### ***Term 2***

DGIN 5201.03 Digital Transformation

+ Two electives (6 credit hours) approved by a program advisor

### ***Term 3***

DGIN 5001.03 Capstone in Digital Innovation (if taking internship option)  
DGIN 5002.03 Research Methods (if taking thesis option)

+ Two electives (6 credit hours) approved by a program advisor

### ***Term 4***

DGIN 7000.00 Digital Innovation Internship

*Or*

DGIN 9000.00 Thesis

## Certificates

Students intending to earn one of the following certificates must also be enrolled in the Master of Digital Innovation degree program. It is not guaranteed that all courses listed will be offered each academic year.

### **Certificate in Digital Business**

Students opting to take the Certificate in Digital Business must take the following course as an elective:

ECMM 6000 Overview of Electronic Commerce

Plus, three of the following:

ECMM 6014 Databases, Data Warehouses and Data Mining for Electronic Commerce  
ECMM 6022 Project Management: A Managerial Approach  
ECMM 6026 Management of Information (E-Government): International Experiences, and Perspectives  
ECMM 6068 Internet and Media Law  
CSCI 6610 Human Computer Interaction  
CSCI 6509 Advanced Topics in Natural Language Processing  
CSCI 6505 Machine Learning  
CSCI 6612 Visual Analytics  
BUSI 6511 Business Process Integration Using ERP Systems  
BUSI 6513 Business Analytics and Data Visualization  
BUSI 5902 Starting Lean  
BUSI 6002 New Venture Creation

## Certificate in Health Informatics

Students opting to take the Certificate in Health Informatics must take the following courses as electives:

HINF 6101 Health Information Flow and Use  
HINF 6110 Health Information Systems and Issues  
HINF 6230 Knowledge Management for Health Informatics

Plus, two of the following:

HINF 6102 Health Information Standards and Use  
HINF 6210 Databases and Data Mining for Health Informatics  
HINF 6020 Research Methods

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### DGIN 5001 Capstone in Digital Innovation

CREDIT HOURS: 3

This course requires students to apply principles of Digital Innovation (DI) holistically to a concrete problem. In the context of a multidisciplinary team, students are expected to apply DI processes, develop negotiation and collaborative skills.

PREREQUISITES: DGIN 5201.03

### DGIN 5002 Research Methods

CREDIT HOURS: 3

This class will provide Master of Digital Innovation thesis students with an understanding of the principles of empirical science as they relate to computer science related research. The goal is for the student to determine the research methods most appropriate for their research area and to be able to design simple to moderately complicated research studies. The course covers both quantitative and qualitative research issues and will provide a practical introduction to the statistics through hand-on tutorials. In addition, this course will provide the basis for critical reading of research findings in the literature and students will gain experience with scientific writing. This course will teach students how to assess the validity of other researchers' articles, and at the same time, enable students to validate their own research.

### DGIN 5100 Foundations in Web Technologies

CREDIT HOURS: 3

This hands-on course examines the technologies and infrastructure required to support digital innovation. The course examines the major components of the information technology infrastructure, such as networks, databases and data warehouses, electronic payment, security, and human-computer interfaces. The course covers key web concepts and skills for designing, creating and maintaining websites, such as Grid Theory, HTML5, CSS, JavaScript, AJAX theory, PHP, SQL and NoSQL databases. Other principles such as Web Accessibility, Usability and User experience, as well as best security practices, are explored in detail through a combination of lectures, in-class examples, individual lab work and assignments, and a final group project.

### DGIN 5200 Foundations in Business

CREDIT HOURS: 3

DGIN 5200 is suitable for graduate students from a variety of backgrounds. The overall aim of this course is to develop a high-level understanding of the dynamics of innovation, the distribution and outcomes of the strategic management of innovation and the relationships that are important in developing high-impact organizations. The course is in three parts. The first part of the course is designed to introduce an understanding of patterns of change in technology and markets. The second part of the course is designed to address the distribution and sources of innovation and how companies appropriate

value from entrepreneurial opportunities. The third part of the course is designed to introduce key ideas in constructing and articulating strategies for developing high-impact, entrepreneurial organizations.

PREREQUISITES: DGIN 5201

### **DGIN 5201 Digital Transformation**

CREDIT HOURS: 3

Digital technologies are nowadays critical to new product development and business transformation. Digital Innovation refers to “the carrying out of new combinations of digital technologies and physical components to produce novel products, processes, and services” (Yoo et al., 2010)<sup>3</sup>. The concept of digital innovation entails not only ‘Digitization’ of physical products or traditional services, but it also requires firms to revisit their use of corporate digital resources, such as IT (Information Technology) assets and capabilities. This core digital innovation course focuses on the design and management of digital innovation projects for both public sector and private sector organizations. Specifically, this course provides students with knowledge and skills to initiate and execute digital innovation and transformation projects in existing organizations or new start-ups.

PREREQUISITES: 6.0 credit hours of DGIN courses

### **DGIN 5300 Law, Policy and Ethics in Emerging Technologies**

CREDIT HOURS: 3

Emerging technologies—such as digital media, the “internet of things”, artificial intelligence (AI), and financial tech—are playing an increasingly central role in how individuals live and interact with each other; how businesses innovate and create new opportunities; and how governments function and serve their populations. But the unrestrained development and use of these technologies can raise complex legal, policy, and ethical challenges. This course offers students an introduction to foundational legal, policy, and ethical issues raised by emerging technologies in a variety of contexts, with special consideration for digital innovation and commerce. On completion, students will be able to better identify, understand, and critically assess these issues and also more effectively manage and resolve them in the course of the professional pursuits.

### **DGIN 5400 Statistics for Health Informatics**

CREDIT HOURS: 3

This course covers essential statistical methods for medical research. Topics include descriptive analysis techniques and basic principles of statistical inference for comparison of means, proportions, and investigation of relationships between variables using regression modeling techniques. Students will also become familiar with nonparametric tests and power and sample size calculations.

### **DGIN 6901 Directed Studies in Digital Innovation**

CREDIT HOURS: 3

This course offers the student the opportunity to undertake further study into a specific topic of interest that is not covered in the regular course offerings. The student will be supervised by a faculty member competent in the area of interest, and within area of Digital Innovation. Regular meetings between the student and supervising faculty will be held. A substantial project and report are required. This course would typically be taken by a student in Thesis option of the program with their thesis supervisor.

RESTRICTIONS: Students must be registered in the Master of Digital (MDI) degree program and the signature/approval of the program director is required for registration into this course.

### **DGIN 6902 Special Topics in Digital Innovation**

CREDIT HOURS: 3

This graduate course examines topics determined by the interests of the students and the instructor in Digital Innovation, not covered by the other courses offered in the graduate program.

RESTRICTIONS: Students must be registered in the Master of Digital Innovation (MDI) degree program.

### **DGIN 7000 Internship in Digital Innovation**

CREDIT HOURS: 0

RESTRICTIONS: Students must be registered in the Master of Digital Innovation (MDI) degree program.

### **DGIN 9000 Master's Thesis**

CREDIT HOURS: 0

RESTRICTIONS: Students must be registered in the Master of Digital Innovation (MDI) degree program.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Graduate Courses

All graduate students are required to attend and participate in regular Faculty seminars. Thesis students (MCS and PhD) must register in CSCI 6999 and attend a minimum number of seminars, as a requirement for graduation.

Graduate students can take any graduate course by permission of the instructor and the Graduate Committee.

## Course Descriptions

### **CSCI 5001 Privacy & IT**

CREDIT HOURS: 3

This course will discuss the concepts, culture, and legislative requirements of privacy viewed through a lens of Information Technology. While giving a global overview of privacy, the class will provide students with a practical grounding of the administration of privacy in Canada.

### **CSCI 5100 Communicating Computer Science Ideas**

CREDIT HOURS: 3

In this course, we will focus on creating the appropriate document or presentation in a variety of situations. Emphasis will be on reducing/removing noise (anything that distracts from the message) and on increasing/adding relevance (things that reinforce understanding of the message).

FORMATS: Lecture

### **CSCI 5193 Technology Innovation**

CREDIT HOURS: 3

Technology Innovation combines elements of design thinking, rapid prototyping, and software development that can be used to validate ideas that could yield new technologies and new business models. The students work in interdisciplinary teams to address a Design Challenge posed by industry. The ideas advanced by teams will reflect the powerful synergies that exist between software development, design thinking and entrepreneurship.

PREREQUISITES: CSCI 5100.03, CSCI 5308.03, CSCI 5408.03

### **CSCI 5306 Applied Program Comprehension**

CREDIT HOURS: 3

This course examines the topic of Program Comprehension - the art of code reading, understanding, and analysis. Students will learn how to study, read, diagram, and maintain large (millions of lines of code) programs using both formal and informal techniques. The goal is to achieve comfort in approaching large, unfamiliar systems upon which some form of development or maintenance must be performed.

PREREQUISITES: CSCI 5100.03, CSCI 5308.03, CSCI 5408.03

### **CSCI 5308 Advanced topics in Software Development**

CREDIT HOURS: 3

This course will provide students with the fundamentals of producing high quality code in a team-based programming environment. The concepts covered in class will be implemented during the group project. After establishing the coding environment using Agile methodology; efficiently automating builds,

deployment, and configuration; and integrating source control, students will learn to write clean, readable code using S.O.L.I.D principles, the proper use of cohesion and coupling, and design patterns. Other topics include establishing data, business logic and display logic boundaries; error handling and logging; refactoring; and test-driven development.

RESTRICTIONS: Restricted to students enrolled in the Master of Applied Computer Science (MACS) degree program.

### **CSCI 5408 Data Management, Warehousing, and Analytics**

CREDIT HOURS: 3

In this course, we will focus on three pillars for managing and analyzing data in distributed and cloud environments: Management of data in distributed systems, Data Warehousing, and Data Analytics.

EXCLUSIONS: CSCI 6405.03

FORMATS: Lecture

### **CSCI 5409 Advanced Topics in Cloud Computing**

CREDIT HOURS: 3

Cloud computing provides users with the ability to access and use computational, storage, and interconnect resources as services offered by cloud providers. This course provides the students with the theoretical foundations of the cloud computing as well as with hands-on experience in using various cloud technologies. Topics covered are related to the types of cloud services, cloud infrastructure, distributed storage models, and programming models offered as general services and also developed for Big Data. Topics will also include underlying technologies, such as virtualization.

PREREQUISITES: CSCI 5100.03, CSCI 5308.03, CSCI 5408.03

RESTRICTIONS: Restricted to students in the Master of Applied Computer Science (MACS) degree program.

EXCLUSIONS: CSCI 4145.03

### **CSCI 5410 Serverless Data Processing**

CREDIT HOURS: 3

Students will learn about serverless cloud architectures using the real-world problem domain of large-scale data analytics. The course views a serverless cloud architecture as a utility computing or Function as a Service (FaaS). Students will gain experience in designing and provisioning cloud infrastructure for large scale applications. The course uses framework/ tools in an optimized manner to speedup large scale data analysis and to improve robustness of the cloud platform. Further, the course focuses on solving real-world problems where security, robustness, and completeness of data analysis are the primary concerns.

PREREQUISITES: CSCI 5100, CSCI 5308, CSCI 5408

### **CSCI 5601 Designing for User Experience**

CREDIT HOURS: 3

This is a hands-on course that focuses on existing and emerging design principles and practices that should be considered when designing systems for quality user experience. Topics include understanding and designing for user needs and experience, applying design guidelines, prototyping and evaluation techniques.

PREREQUISITES: CSCI 5100.03, CSCI 5408.03, and CSCI 5708.03

### **CSCI 5708 Mobile Computing**

CREDIT HOURS: 3

This course covers the principles of mobile computing and the concepts and techniques underlying the design and development of mobile computing applications. Mobile computing is discussed from technological, application, and user perspectives. Topics include mobile and wireless communication technologies, development environments, applications design for resource limited and failure-prone environments, user interface issues in the mobile computing setting, and the future of mobile computing.

CALENDAR NOTES: Students are expected to have Computer Organization and Computer Networks at the undergraduate computer science level.

PREREQUISITES: CSCI 5100.03, CSCI 5308.03 and CSCI 5408.03

EXCLUSIONS: CSCI 4176.03

### **CSCI 5709 Advanced Topics in Web Development**

CREDIT HOURS: 3

This course provides a hands-on learning environment for advanced web development techniques, such as HTML5 APIs for the creation of dynamic web graphics as well as adding offline functionality to web applications, and server-side APIs for extending the back-end functionality of web applications. Advanced security, performance monitoring, and testing approaches are also covered to facilitate the creation of efficient and secure web applications. Finally, this hands-on course also highlights the importance of ethical web development principles and documentation.

PREREQUISITES: CSCI 5100.03, CSCI 5308.03, CSCI 5408.03

RESTRICTIONS: This course is restricted to those in the Master of Applied Computer Science (MACS) degree programs.

EXCLUSIONS: CSCI 4177.03

### **CSCI 5901 Special Graduate Topics in Applied Computer Science**

CREDIT HOURS: 3

PREREQUISITES: CSCI 5100.03, CSCI 5308, CSCI 5408.03

RESTRICTIONS: Restricted to those students enrolled in the Master of Applied Computer Science (MACS) degree program.

### **CSCI 5902 Special Graduate Topics in Applied Computer Science**

CREDIT HOURS: 3

PREREQUISITES: CSCI 5100.03, CSCI 5308, CSCI 5408.03

RESTRICTIONS: Restricted to students registered in the Master of Applied Computer Science (MACS) degree program.

### **CSCI 6055 Research Methods and Statistics**

CREDIT HOURS: 3

Students will gain an understanding empirical science principles as they relate to computer science research. Each student will determine the research methods most appropriate for their research area and will design a research study. the course covers both quantitative and qualitative research issues and provides a practical introduction to statistics.

FORMATS: Lecture | Lab | Tutorial

### **CSCI 6057 Advanced Data Structures**

CREDIT HOURS: 3

Data structures play a central role in many modern applications and are essential building blocks of efficient algorithms. This course covers classical results and recent advancements on data structures. This includes data structures that improve search efficiency under various machine models, text indexing structures, and data structures for large data.

PREREQUISITES: CSCI 3110.03 or equivalent

FORMATS: Lecture

### **CSCI 6061 Advanced Quantitative Research Methods**

CREDIT HOURS: 3

This project-based course presents advanced quantitative research methods for computer science, software engineering and related fields. It combines theoretical foundations and practical experience in a variety of research approaches including controlled experiments, panel studies, systematic reviews, case studies, and questionnaires. Topics include instrumentation, sampling, measurement, epistemology, advanced statistical analysis and academic writing.

CALENDAR NOTES: Students should have already completed an introductory course in research methods such as CSCI 6055 or have a good understanding of fundamental quantitative research method topics.

### **CSCI 6062 Advanced Qualitative Research Methods**

CREDIT HOURS: 3

This project-based course presents qualitative research methods as they are applied to human-centered research in areas of computer science like Human-Computer Interaction and software engineering. This course will provide students with theoretical foundations combined with hands-on experience to apply qualitative research theories and techniques to real-world, technology design challenges. Topics will cover i) methodologies for data collection; ii) an overview of data analysis methods; and iii) the non-trivial transformation of qualitative findings to implications for technology design. A strong emphasis will be placed on the ethical treatment of human participants, as well as how to navigate cross-cultural methodology challenges when collecting and analyzing data from a culturally diverse participant sample.

COREQUISITES: A foundational knowledge of Human-Computer Interaction is recommended but not required.

### **CSCI 6101 Advanced Topics in Analysis of Algorithms**

CREDIT HOURS: 3

This research-oriented course covers advanced material in the design and analysis of algorithms. It combines mathematically rigorous coverage of traditional topics with recent research results. Problems are taken from a wide range of areas including combinatorics, numerical computation, graph algorithms, string matching, approximation algorithms, computational geometry, NP-completeness.

PREREQUISITES: CSCI 3110.03 or equivalent

EXCLUSIONS: COMP 5130.03

### **CSCI 6306 Topics in Program Comprehension**

CREDIT HOURS: 3

This course explores current issues in program comprehension and the process of acquiring sufficient knowledge about a software system in order to perform a specified maintenance task. Topics include, but are not limited to, software visualization, design extraction, cognitive theories of comprehension, configuration management, information representation and comprehension tools.

### **CSCI 6307 Usable Privacy and Security**

CREDIT HOURS: 3

Human factors play an important role in the effectiveness of security and privacy solutions. This course introduces students to several usability and user interface problems related to privacy and security, and to give them experience in designing studies aimed at helping to evaluate usability issues in security and privacy systems.

### **CSCI 6311 Topics in Entrepreneurship**

CREDIT HOURS: 3

This course examines topics related to entrepreneurship determined by the interests of the students and the instructor.

### **CSCI 6312 Topics in Entrepreneurship**

CREDIT HOURS: 3

This course examines topics related to entrepreneurship determined by the interests of the students and the instructor.

### **CSCI 6313 Introduction to Blockchains**

CREDIT HOURS: 3

Students in this course learn the concepts of blockchain technologies and how to apply them in the design and implementation of Distributed Applications (DApps) that utilize smart contracts for their coordination and transaction execution. They learn about the blockchain cryptographic properties to achieve immutability and other desirable properties that blockchains achieve; distributed architectures and protocols used to achieve consensus in distributed environment; infrastructure used to implement blockchains; and about Ethereum and Hyperledger fabrics, the two most prominent blockchain technologies that introduced flexible contracts, wherein Ethereum is a public blockchain that can be joined by anyone, while Hyperledger is permissioned. Research topics, related to the challenges faced by the blockchain fabric, will be explored, including approaches to improve scalability, transaction throughput, consensus algorithms, privacy and anonymity, and other topics, such as governance, cryptocurrencies, use of blockchains for increasing trust, and blockchain-assistive technologies, such as IPFS and side-chains.

PREREQUISITES: Students should be competent in writing distributed applications in which components communicate using REST-full services.

### **CSCI 6405 Data Mining and Data Warehousing**

CREDIT HOURS: 3

This course gives a basic exposition of the goals and methods of data mining and data warehouses, including concepts, principles, architectures, algorithms, implementations, and applications. The main topics include an overview of databases, data warehouses and data mining technology, data warehousing and online analytical process (OLAP), concept mining, association mining, classification and predication, and clustering. Software tools for data mining and data warehousing and their design will also be introduced.

EXCLUSIONS: CSCI 5408.03

### **CSCI 6406 Visualization**

CREDIT HOURS: 3

This course focuses on graphical techniques for data visualization that assist in the extraction of meaning from datasets. This involves the design and development of efficient tools for the exploration of large and often complex information domains. Applications of visualization are broad, including

computer science, geography, the social sciences, mathematics, science, and medicine, as well as architecture and design. The course will cover all aspects of visualization including fundamental concepts, algorithms, data structures, and the role of human perception.

### **CSCI 6408 Ocean Data Science**

CREDIT HOURS: 3

Ocean data is a key asset for sustainable exploitation of the Ocean. Many ocean-related industries and organizations are collecting large amounts of data with the goal of optimizing their decision processes. This course will enable students to gain knowledge about key methods and techniques for analyzing these data greatly enhancing their value in terms of the ocean economy.

PREREQUISITES: Students should have good programming skills and knowledge of basic machine learning and/or statistics.

### **CSCI 6409 Process of Data Science**

CREDIT HOURS: 3

The advent of low-cost storage and processing power coupled with ever increasing amounts of "born digital" data has created the new field of data science. The ability to achieve a specific goal or answer a business question by crunching through very large and complex databases is becoming a competitive advantage for businesses and leads to new discoveries in science and medicine. This course is an overview of the different processes that make up a data science project. While other fields concentrate on finding previously unknown knowledge or searching for a specific pattern, data science focuses on answering deep questions and making the conclusions accessible to the rest of the organization. This course requires the implementation of software and experimental design in order to complete the assignments.

EXCLUSIONS: CSCI 4146

### **CSCI 6505 Machine Learning**

CREDIT HOURS: 3

Machine Learning is the area of Artificial Intelligence concerned with the problem of building computer programs that automatically improve with experience. The intent of this course is to present a broad introduction to the principles and paradigms underlying machine learning, including discussions of each of the major approaches currently being investigated. Main topics covered in the course include a review of information theory, unsupervised learning, or clustering (the K-means family, co-clustering, mixture models and the EM algorithm), supervised learning or classification (support vector machines, decision trees, rule learning, Bayesian learners, maximum entropy, ensemble methods), feature selection and feature transformations. The focus of applications that will be discussed will be text classification and clustering.

PREREQUISITES: CSCI 3150.03 or 4150.03 (Artificial Intelligence) or permission of the instructor.

### **CSCI 6506 Genetic Algorithms and Programming**

CREDIT HOURS: 3

The concept of stochastic search algorithms is introduced by way of answers to the generic machine learning requirements: representation, goal state, and credit assignment. Schema theory is introduced as an underlying model for evolutionary problem solving. The significance of assuming different representations is investigated through various case studies. Different forms of 'goal state' are investigated, including multi-objective models and co-evolution are investigated in some detail and demonstrated to provide the basis for problem decomposition, game behavior design and computational efficiency.

### **CSCI 6508 Fundamentals of Computational Neuroscience**

CREDIT HOURS: 3

This course introduces the principles of information processing in the brain, including the functionality of single neurons, networks of neurons, and large-scale neural architectures for specific cognitive functions. Specific topics include information theory, memory, object recognition, adaptive systems, vision, motor control, and an introduction to MATLAB.

PREREQUISITES: Permission of the instructor

### **CSCI 6509 Advanced Topics in Natural Language Processing**

CREDIT HOURS: 3

Natural Language Processing (NLP) is an area of Artificial Intelligence concerned with the problem of automatically analyzing and generating a natural language, such as English, French, or other, in written or spoken form. It is a relatively old area of computer science, but it is still a very active research area. This course introduces fundamental concepts and principals used in NLP with emphasis on statistical approaches to NLP and unification-based grammars. In the application part of the course, we discuss the problems of question answering, machine translation, text classification, information extraction, grammar induction, and dictionary generation and other.



### **CSCI 6511 Autonomous Robotics.**

CREDIT HOURS: 3

FORMATS: Lecture | Lab

### **CSCI 6514 Search and Optimization**

CREDIT HOURS: 3

This course provides a broad overview of strategies for tackling difficult optimization problems that occur in computer science, in the engineering sciences, and beyond. It covers “classical” algorithms such as conjugate gradient strategies as well as more recent, nature-inspired approaches including evolutionary methods and simulated annealing. Its goal is to not only introduce the various paradigms, but to contrast them and to critically evaluate their respective merits based on a mathematically founded understanding of their properties. A research project to be worked on individually or in groups will be a major component of the course.

### **CSCI 6515 Machine learning for Big Data**

CREDIT HOURS: 3

In this course, we will focus on Big Data and the Pillars of that emerging discipline: machine learning/data mining, elements of high-performance computing, and data visualization. Significant part of the course will be devoted to selected, efficient methods for building models from large datasets data using machine learning techniques.

PREREQUISITES: CSCI 2141.03, MATH 2030.03, STAT 2060.03, CSCI 3110.03 or permission of the instructor.

### **CSCI 6516 Deep Learning**

CREDIT HOURS: 3

Deep Learning is a subfield of Machine Learning; in this course, we study concepts that build on the fundamentals of neural networks and machine learning. This extension of concepts may include topics such as variational autoencoders, dilated convolutional networks, generative adversarial networks, adversarial examples, attention mechanisms, the transformer architecture, language models such as ELMo and BERT. In doing so, we improve our understanding of how the more basic systems work and explore foundations such as optimization techniques.

CALENDAR NOTES: Students are expected to have a knowledge of fundamental concepts of Machine Learning. Students are also expected to strong mathematical skills in multivariate calculus, linear algebra (e.g., eigen-decomposition), and probability (e.g., multi-dimensional Gaussian pdf).

### **CSCI 6606 Human Factors in On-Line Information Systems**

CREDIT HOURS: 3

Introduction to issues related to behavioural/human aspects of computing as applied to hypertext and other on-line information tools.

### **CSCI 6608 Advanced Computer Animation**

CREDIT HOURS: 3

The course introduces students to fundamental and advanced techniques and algorithms in Computer Animation. Topics include interpolation based and kinematic techniques, physically based modelling, motion capture, and character animation.

PREREQUISITES: Undergraduate course in Computer Graphics or Animation, or instructor's consent.

### **CSCI 6609 Ubiquitous Computing**

CREDIT HOURS: 3

Ubiquitous Computing moves computing off the desktop and into the fabric of our everyday lives. This course explores both systems and human-centric advances in Ubiquitous computing, including sensing, middleware, locative applications, smart environments, ambient displays, and tangible interactions. Students will design and implement a Ubiquitous Computing application prototype.

FORMATS: Lecture

### **CSCI 6610 Human Computer Interaction**

CREDIT HOURS: 3

Human-Computer interaction (HCI) deals with facilitating human-computer communication. Students will learn the foundations of HCI, including the process for user-centered development, the models that inform HCI design, the social issues influencing HCI design and use, and the evaluation of interfaces and systems with users.

PREREQUISITES: CSCI 3160 or equivalent

FORMATS: Lecture | Lab

### **CSCI 6611 Persuasive Computing Design**

CREDIT HOURS: 3

Persuasion Technologies (PTs) are interactive systems designed to motivate people to change their behaviours without using coercion or deceit. This course will explore the fundamental theory, principle, and practice in the design, implementation, and evaluation of persuasive systems. Topics include theories of persuasion and behaviour change, persuasive strategies, application of the theories and strategies in persuasive interface/system design, persuasive system evaluation methods, approaches for personalizing and adapting persuasive systems, privacy, and ethical issues of persuasive systems. Students will get hands-on experience on persuasive user interface design and evaluation, user studies, behaviour modelling, persuasive affordances of various technological platforms (e.g., mobile, social media, games), and ethics of PT through case analysis, critics, real-world project, project report, and project presentation.

CALENDAR NOTES: It is expected that students have a knowledge of user interface design and an interest in designing human-computer interfaces and/or systems that motivate behaviour change.

### **CSCI 6612 Visual Analytics**

CREDIT HOURS: 3

This course will introduce the concepts of Visual Analytics (VA). VA is a multi-disciplinary domain that combines data visualization with machine learning and other automated techniques to help people make sense of data. Students will be introduced to the design of visual representations supporting tasks to go from findings to insights based on data. Topics include basic concepts of information visualization and machine learning; visual analytics of evolving phenomena; analysis of spatial and temporal data sets; visual social media analytics; and the visual analytics of text and multimedia collections. Students will prototype visual analytics applications using existing toolkits, coupling machine learning and visualization methods. Students will gain competence in performing data analysis and visualization tasks in different application domains.

CALENDAR NOTES: Students must be proficient in at least one or multiple programming languages that support the design of interactive visual interfaces and the execution of data mining/machine learning libraries and toolkits.

### **CSCI 6613 The Web of Open Linked Data**

CREDIT HOURS: 3

The Web of Linked Data (WLD) is a major step towards making abstractions represented in data into something that can be meaningfully manipulated by computing machines. This experiential-learning project-based course introduces models and technologies for representing, aggregating, and machine reasoning about data using WWW standards (e.g., XML, RDF, OWL, SPARQL, RIF). The course prepares students to build applications and services for open government, eCommerce, OpenStreetMap, etc. The course also explores key issues in the development of the future of linked data.

### **CSCI 6702 Parallel Computing**

CREDIT HOURS: 3

This course explores various aspects of parallel computing including parallel architectures, systems, programming languages and implementation issues. It focuses on solving real problems on existing parallel machines. Students will participate in an implementation of a significant parallel computing project.

### **CSCI 6704 Advanced Topics in Networks**

CREDIT HOURS: 3

The primary focus of this course is to provide a comprehensive coverage of emerging and emergent network technologies that lay the foundation for the design of next generation high-performance global internetworks. Topics covered include advanced TCP/IP design, ATM protocols, Gigabit Ethernet, IPv6 networks and protocols, Secure Networks and VPNs, Wireless Networks, Optical Networks, and Internetwork Architecture Case Studies.

PREREQUISITES: CSCI 4171.03 or equivalent

EXCLUSIONS: COMP 5550.03

### **CSCI 6706 Network Design and Management**

CREDIT HOURS: 3

The distributed enterprise information system consisting of workstations, servers, bridges, routers, hubs, Internet, and interactive Web technology is critical to corporate productivity. This course explores how Information Technology (IT) can be used to manage an enterprise. It further examines how managers can strategically use IT to capture and deliver knowledge more efficiently and to create a competitive advantage.

PREREQUISITES: CSCI 4171.03

### **CSCI 6708 Advanced Topics in Network Security**

CREDIT HOURS: 3

This course will provide a comprehensive coverage of the design of secure information systems with emphasis on secure networking and secure information transfer. It will also include topical and emerging areas in security such as wireless network security, mobile device security, security and privacy issues in mobile cloud computing, the establishment of an organization-wide security plan and bio-metric identification systems.

PREREQUISITES: Undergraduate course in network

FORMATS: Lecture

### **CSCI 6709 Software Defined Networking**

CREDIT HOURS: 3

Software Defined Networking (SDN) is one approach to designing networks, where network control functions (control plane) is decoupled from the hardware (data plane) like router or switches. The decoupled control plane or controller gathers a global network view to dynamically configure and manage network operations to meet the demand of applications. This course will introduce students to the SDN architecture and show how it can be used to efficiently design various networks.

### **CSCI 6710 Advanced Mobile Communication Systems**

CREDIT HOURS: 3

This course is composed of two components. In the first component, a review of the foundational topics in mobile communication systems (including Wireless Sensor Networks, Wireless Ad Hoc Networks, Vehicular Networks, Mobile Cloud Computing, Mobile Edge Computing, Mobility Models, Localization and Positioning, and Data Analytics for Mobile Networks) will be provided. In the second component, we will study the state-of-the-art technologies on mobile communication systems using the latest research papers from top conferences and journals, such as IEEE International Conference on Computer Communications (INFOCOM) and IEEE Transaction on Wireless Communications (TWC). In addition, by completing an in-depth course project, the students will gain a thorough understanding of a specific problem in mobile communication systems.

RESTRICTIONS: Restricted to graduate level students only.

### **CSCI 6801 Computational Biology and Bioinformatics**

CREDIT HOURS: 3

This course is an introduction to current problems and techniques in computational biology and bioinformatics. The emphasis is put in the following themes: sequence analysis, phylogenetic inference, and structural biology. No biological background is assumed although the course covers many relevant biological concepts.

RESTRICTIONS: Graduate student in Computer Science or Instructor's approval.

### **CSCI 6802 Algorithms in Bioinformatics**

CREDIT HOURS: 3

The discipline of bioinformatics applies sophisticated computational and statistical techniques to problems in the biological domain. This course will focus on a few bio sequence-related challenges in depth, examining the complexity and efficiency of different approaches, the relationship between statistical optimality and biological reality, and the consistency (or lack thereof) among methods.

### **CSCI 6901 Directed Studies**

CREDIT HOURS: 3

This course offers the student the opportunity to undertake further study into a specific topic of interest that is not covered in the regular course offerings. The student will be supervised by a faculty member competent in the area of interest. Regular meetings between the student and supervising faculty will be held. A substantial project and report are required.

PREREQUISITES: Permission of the Graduate Committee

### **CSCI 6902 Doctoral Directed Studies**

CREDIT HOURS: 3

This course offers the doctoral student the opportunity to undertake further study into a specific topic of interest that is not covered in the regular course offerings. The student will be supervised by a faculty member competent in the area of interest. Regular meetings between the student and supervising

faculty will be held. A substantial project and report are required.

PREREQUISITES: Permission of the Graduate Committee

### **CSCI 6903 Special Graduate Topics in Computer Science**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to CSCI 6904/CSCI 6905/CSCI 6906/CSCI 6907/CSCI 6908.

### **CSCI 6904 Special Graduate Topics in Computer Science**

CREDIT HOURS: 3

See CSCI 6903.

### **CSCI 6905 Special Graduate Topics in Computer Science**

CREDIT HOURS: 3

See CSCI 6903.

### **CSCI 6906 Special Graduate Topics in Computer Science**

CREDIT HOURS: 3

See CSCI 6903.

### **CSCI 6907 Special Graduate Topics in Computer Science**

CREDIT HOURS: 3

See CSCI 6903.

### **CSCI 6908 Special Graduate Topics in Computer Science**

CREDIT HOURS: 3

### **CSCI 6999 Research Seminar in Computer Science**

CREDIT HOURS: 0

A research seminar course, to introduce Computer Science graduate students to thesis-based programs to contemporary research topics and projects, through regular attendance of the Faculty of Computer Science Research Seminar Series. Speakers include both Dalhousie Computer Science researchers and visiting speakers from other institutions.

PREREQUISITES: Admission to a thesis-based graduate program in the faculty of Computer Science.

### **CSCI 7001 Research Project in Computer Science**

CREDIT HOURS: 6

The course provides the students in the Master of Applied Computer Science program with an opportunity to conduct a research project under the supervision of a faculty member. Regular meetings between the student and the supervising faculty will be held. A project report and open presentation are required.

CALENDAR NOTES: Credit can only be given for this course if completed in consecutive terms and partial credit cannot be given for a single term.

PREREQUISITES: CSCI 5100.03 and CSCI 5408.03 and CSCI 5308.03

### **CSCI 7900 Directed Doctoral Research Project**

CREDIT HOURS: 6

This course provides doctoral students with an opportunity to conduct a research project under the supervision of a faculty member leading to the research aptitude examination. Regular meetings between the student and the supervising faculty will be held. A project report and oral defense to a committee are

required.

CALENDAR NOTES: Credit can only be given for this course if the course is completed in consecutive terms and partial credit cannot be given for a single term.

### **CSCI 9000 Master's Thesis**

CREDIT HOURS: 0

### **CSCI 9100 Industrial Internship**

CREDIT HOURS: 3

PREREQUISITES: CSCI 5100, CSCI 5408, CSCI 5708, CSCI 9890

FORMATS: Other (explain in comments)

### **CSCI 9101 Industrial Internship 1**

CREDIT HOURS: 3

CALENDAR NOTES: This course is intended for students enrolled in the TRIBE CREATE program.

RESTRICTIONS: Graduate level students only.

### **CSCI 9102 Industrial Internship 2**

CREDIT HOURS: 3

CALENDAR NOTES: This course is intended for students enrolled in the TRIBE CREATE program.

RESTRICTIONS: Restricted to students enrolled in a graduate program.

### **CSCI 9200 Entrepreneurial Internship**

CREDIT HOURS: 3

PREREQUISITES: CSCI 5100, CSCI 5408, CSCI 5708, BUSI 5902, BUSI 6002

FORMATS: Other (explain in comments)

### **CSCI 9301 Research Project 1**

CREDIT HOURS: 3

Students carry out research and related activities under the supervision of a faculty member. Work done in this course is intended to prepare and contribute to the research project that is part of the requirements of the Master of Applied Computer Science (MACS) program.

PREREQUISITES: CSCI 5100.03, CSCI 5408.03, and CSCI 5708.03

### **CSCI 9302 Research Project 2**

CREDIT HOURS: 3

Students carry out research and related activities under the supervision of a faculty member. Work done in this course is intended to prepare and contribute to the research project that is part of the requirements of the Master of Applied Computer Science (MACS) program.

COREQUISITES: CSCI 9301.03

PREREQUISITES: CSCI 5100.03, CSCI 5408.03, and CSCI 5708.03

### **CSCI 9530 Doctoral Thesis**

### **CSCI 9890 Internship Preparation**

CREDIT HOURS: 0

This course is designed to provide graduate students with the tools required to find an internship and be successful, whilst developing vital professional competencies. Aspects of career planning and development, self-assessment, resume and cover letter writing, interviewing skills, and job search techniques will be introduced. Students will also be provided with an overview of all relevant co-op program policies and procedures. This course should be completed two terms prior to the first work term. The grade will be Pass/Fail.

## **Digital Innovation**

### **Introduction**

Today's rapidly changing digital landscape is changing the way industries and entire systems work, even those that have not been traditionally viewed as "digital". From healthcare and banking to fisheries and oceans, companies across all industries and sectors are looking for leaders with the technical and business knowledge to help them manage change and identify opportunities in the face of digital innovation.

The Master of Digital Innovation (MDI) is a customizable interdisciplinary program where students gain the knowledge and experience, they need to enter a digital management career. Curriculum is delivered by experts from the Faculties of Computer Science, Management, Law, and Medicine.

Students can customize their program with certificate, work term and thesis options. Certificates provide a distinct set of skills and knowledge to meet educational and career objectives. There are currently two certificate options in digital business and health informatics.

### **Please send Graduate Application Documents to:**

#### **Graduate Admissions and Recruitment**

6050 University Avenue, Room 106  
PO Box 15000  
Halifax, NS B3H 4R2 Canada

## **Digital Innovation**

Location:  
Goldberg Computer Science Building  
6050 University Avenue

PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-2740  
Fax Number: (902) 492-1517  
Email Address: [graduate@cs.dal.ca](mailto:graduate@cs.dal.ca)  
Website: <https://www.dal.ca/digitalinnovation>

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**Smit, M.**, BCSc, MSc (Dalhousie), PhD (Alberta), PDF (York)  
**Stewart, S.**, BSc (King's), MMath (Waterloo), PhD (Dalhousie)

## Admission Requirements

As this program is fundamentally interdisciplinary, it seeks to educate and train students at the intersection of computing, business and domain knowledge. As such, the program will be open to a wide range of students who hold an undergraduate degree in computer science, business, or a discipline related to the domains in question. Students with undergraduate degrees related to domains that are undergoing digital innovation, such as healthcare, government etc. would also be considered as ideal candidates for this program.

The general admission requirements for the program are the same as existing graduate programs at Dalhousie University. For more information visit [https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission\\_requirements.html](https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission_requirements.html).

## Program Outline

Most full-time students will take 4 terms to complete the Master of Digital Innovation in the following sequence. If opting to take a certificate, students must meet requirements for the certificate through elective options. Working with an advisor, students will select electives to achieve their professional goals and educational aims. This will happen at any point between admission to the program and beginning their studies.

### **Term 1**

Two of the following:

DGIN 5100.03 Foundations in Web Technologies  
 DGIN 5200.03 Foundations in Business  
 DGIN 5300.03 Law, Policy, and Ethics in Emerging Technologies  
 DGIN 5400.03 Statistics for Health Informatics

+ One elective (3 credit hours) approved by a program advisor

### **Term 2**

DGIN 5201.03 Digital Transformation

+ Two electives (6 credit hours) approved by a program advisor

### **Term 3**

DGIN 5001.03 Capstone in Digital Innovation (if taking internship option)  
 DGIN 5002.03 Research Methods (if taking thesis option)

+ Two electives (6 credit hours) approved by a program advisor

### **Term 4**

DGIN 7000.00 Digital Innovation Internship

Or

DGIN 9000.00 Thesis

## Certificates

Students intending to earn one of the following certificates must also be enrolled in the Master of Digital Innovation degree program. It is not guaranteed that all courses listed will be offered each academic year.

### Certificate in Digital Business

Students opting to take the Certificate in Digital Business must take the following course as an elective:

ECMM 6000 Overview of Electronic Commerce

Plus, three of the following:

ECMM 6014 Databases, Data Warehouses and Data Mining for Electronic Commerce

ECMM 6022 Project Management: A Managerial Approach

ECMM 6026 Management of Information (E-Government): International Experiences, and Perspectives

ECMM 6068 Internet and Media Law

CSCI 6610 Human Computer Interaction

CSCI 6509 Advanced Topics in Natural Language Processing

CSCI 6505 Machine Learning

CSCI 6612 Visual Analytics

BUSI 6511 Business Process Integration Using ERP Systems

BUSI 6513 Business Analytics and Data Visualization

BUSI 5902 Starting Lean

BUSI 6002 New Venture Creation

### Certificate in Health Informatics

Students opting to take the Certificate in Health Informatics must take the following courses as electives:

HINF 6101 Health Information Flow and Use

HINF 6110 Health Information Systems and Issues

HINF 6230 Knowledge Management for Health Informatics

Plus, two of the following:

HINF 6102 Health Information Standards and Use

HINF 6210 Databases and Data Mining for Health Informatics

HINF 6020 Research Methods

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### DGIN 5001 Capstone in Digital Innovation

CREDIT HOURS: 3

This course requires students to apply principles of Digital Innovation (DI) holistically to a concrete problem. In the context of a multidisciplinary team, students are expected to apply DI processes, develop negotiation and collaborative skills.

PREREQUISITES: DGIN 5201.03



## **DGIN 5002 Research Methods**

CREDIT HOURS: 3

This class will provide Master of Digital Innovation thesis students with an understanding of the principles of empirical science as they relate to computer science related research. The goal is for the student to determine the research methods most appropriate for their research area and to be able to design simple to moderately complicated research studies. The course covers both quantitative and qualitative research issues and will provide a practical introduction to the statistics through hand-on tutorials. In addition, this course will provide the basis for critical reading of research findings in the literature and students will gain experience with scientific writing. This course will teach students how to assess the validity of other researchers' articles, and at the same time, enable students to validate their own research.

## **DGIN 5100 Foundations in Web Technologies**

CREDIT HOURS: 3

This hands-on course examines the technologies and infrastructure required to support digital innovation. The course examines the major components of the information technology infrastructure, such as networks, databases and data warehouses, electronic payment, security, and human-computer interfaces. The course covers key web concepts and skills for designing, creating, and maintaining websites, such as Grid Theory, HTML5, CSS, JavaScript, AJAX theory, PHP, SQL, and NoSQL databases. Other principles such as Web Accessibility, Usability and User experience, as well as best security practices, are explored in detail through a combination of lectures, in-class examples, individual lab work and assignments, and a final group project.

## **DGIN 5200 Foundations in Business**

CREDIT HOURS: 3

DGIN 5200 is suitable for graduate students from a variety of backgrounds. The overall aim of this course is to develop a high-level understanding of the dynamics of innovation, the distribution, and outcomes of the strategic management of innovation and the relationships that are important in developing high-impact organizations. The course is in three parts. The first part of the course is designed to introduce an understanding of patterns of change in technology and markets. The second part of the course is designed to address the distribution and sources of innovation and how companies appropriate value from entrepreneurial opportunities. The third part of the course is designed to introduce key ideas in constructing and articulating strategies for developing high-impact, entrepreneurial organizations.

PREREQUISITES: DGIN 5201

## **DGIN 5201 Digital Transformation**

CREDIT HOURS: 3

Digital technologies are nowadays critical to new product development and business transformation. Digital Innovation refers to “the carrying out of new combinations of digital technologies and physical components to produce novel products, processes, and services” (Yoo et al., 2010)<sup>3</sup>. The concept of digital innovation entails not only ‘Digitization’ of physical products or traditional services, but it also requires firms to revisit their use of corporate digital resources, such as IT (Information Technology) assets and capabilities. This core digital innovation course focuses on the design and management of digital innovation projects for both public sector and private sector organizations. Specifically, this course provides students with knowledge and skills to initiate and execute digital innovation and transformation projects in existing organizations or new start-ups.

PREREQUISITES: 6.0 credit hours of DGIN courses

## **DGIN 5300 Law, Policy and Ethics in Emerging Technologies**

CREDIT HOURS: 3

Emerging technologies—such as digital media, the “internet of things”, artificial intelligence (AI), and financial tech—are playing an increasingly central role in how individuals live and interact with each other; how businesses innovate and create new opportunities; and how governments function and serve their populations. But the unrestrained development and use of these technologies can raise complex legal, policy, and ethical challenges. This course offers students an introduction to foundational legal, policy, and ethical issues raised by emerging technologies in a variety of contexts, with special consideration for digital innovation and commerce. On completion, students will be able to better identify, understand, and critically assess these issues and also more effectively manage and resolve them in the course of the professional pursuits.

## **DGIN 5400 Statistics for Health Informatics**

CREDIT HOURS: 3

This course covers essential statistical methods for medical research. Topics include descriptive analysis techniques and basic principles of statistical inference for comparison of means, proportions, and investigation of relationships between variables using regression modeling techniques. Students will also become familiar with nonparametric tests and power and sample size calculations.

## **DGIN 6901 Directed Studies in Digital Innovation**

CREDIT HOURS: 3

This course offers the student the opportunity to undertake further study into a specific topic of interest that is not covered in the regular course offerings. The student will be supervised by a faculty member competent in the area of interest, and within area of Digital Innovation. Regular meetings between the student and supervising faculty will be held. A substantial project and report are required. This course would typically be taken by a student in Thesis option of the program with their thesis supervisor.

RESTRICTIONS: Students must be registered in the Master of Digital (MDI) degree program and the signature/approval of the program director is required for registration into this course.

### **DGIN 6902 Special Topics in Digital Innovation**

CREDIT HOURS: 3

This graduate course examines topics determined by the interests of the students and the instructor in Digital Innovation, not covered by the other courses offered in the graduate program.

RESTRICTIONS: Students must be registered in the Master of Digital Innovation (MDI) degree program.

### **DGIN 7000 Internship in Digital Innovation**

CREDIT HOURS: 0

RESTRICTIONS: Students must be registered in the Master of Digital Innovation (MDI) degree program.

### **DGIN 9000 Master's Thesis**

CREDIT HOURS: 0

RESTRICTIONS: Students must be registered in the Master of Digital Innovation (MDI) degree program.

## **Earth Sciences**

Location:

Life Sciences Centre  
1459 Oxford Street  
Room 3006  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-2358

Fax Number: (902) 494-6889

Email Address: [earth.sciences@dal.ca](mailto:earth.sciences@dal.ca)

Website: [dal.ca/earthsciences](http://dal.ca/earthsciences)

## **Introduction**

Students with degrees in any of the sciences or mathematics who wish to study some aspect of the Earth are welcome. Graduate work leading to the degrees of MSc and PhD is possible in a number of different fields. These include for example: marine geology and geophysics, Appalachian geology, isotope geology, economic geology, petrology, geochemistry and mineralogy, geophysics, sedimentology, micropaleontology and coastal sedimentation, structural geology, metamorphism, and tectonics.

Interdisciplinary studies are encouraged, and there is active cooperation among the science departments (including Oceanography) at Dalhousie University. Students are urged to take full advantage of the opportunities this affords. Research, on scientific problems of mutual interest to Dalhousie and government laboratories such as the Nova Scotia Department of Natural Resources, and the GSC Atlantic at the Bedford Institute of Oceanography, is often done. Members of these laboratories frequently serve on supervisory committees.

The complex of departments and laboratories in Halifax and Dartmouth concerned with various aspects of the Earth make graduate study in Earth Sciences very attractive.

# Staff

## Chair of Earth and Environmental Sciences

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**Shimeld, J.**, BApplied Sci (Waterloo), MSc (Dalhousie), GSC Atlantic  
**Silva, R.**, BSc, PhD (Univ of Coimbra), University of Exeter  
**Simpson, D. W.**, BSc Honours, MSc (Dalhousie), PhD (Australian National Univ), IRIS Consortium  
**Swinden, S.**, BSc (Dalhousie), MSc, PhD (Memorial)  
**van Rooyen, D.**, BSc, PhD (Carleton), CBU  
**Vincent, H.**, BSc (Univ of West Indies), MSc (Imperial College), PhD (Dalhousie), BP Trinidad and Tobago  
**Waldron, J.**, BA (Cambridge), PhD (Edinburgh), University of Alberta  
**Warren, C.**, BA (Oxford), MSc (Univ College London), DPhil (Oxford)  
**Whipp, D. M.**, BSc, PhD (Univ of Michigan), University of Helsinki  
**Wilson, B.**, BSc Honours (Univ College of Whales), MSc, PhD (Univ of Whales), The University of West Indies  
**Zentilli, M.**, BSc (Univ of Chile), PhD (Queen's)

### **Adjunct (Retired) Faculty**

**Beaumont, C.**

**Jamieson, R. A.**, BSc (Dalhousie), PhD, (Memorial)

**Louden, K.**

**Gibling, M.**, BA (Oxon), PhD (Ottawa)

## **Admission Requirements**

Candidates must satisfy general requirements for admission to the Faculty of Graduate Studies. Candidates seeking financial support should ensure that their applications are complete by January 31.

## **Master of Science (MSc) Degree Program**

The minimum time for completion of the MSc degree is 12 months of full-time study (see [Faculty of Graduate Studies regulations, Section 2.3.1](#)). Experience has shown that most students take at least 24 months to complete their work. Financial support is available for no more than 24 months.

Part-time study is also possible. Conditions for admission to this program are the same as those for full-time students. Financial support is not normally available for part-time study.

Research leading to the preparation and oral defence of a thesis is required.

Program requirements consist of 3-credit hour compulsory course EARTH 6300: Research Design and Scientific Presentation, 9 additional credit hours of electives at the graduate level, and completion of the thesis.

Graduate students are expected to attend the Earth Sciences seminars.

A grade of A or better is required in EARTH6300 to transfer to PhD.

## **Doctor of Philosophy (PhD) Degree Program**

The minimum time required to complete this program is two years from an MSc; normally three years are required (see [Section 2.3.2](#), in the Faculty of Graduate Studies regulations), and the program is governed by regulations and procedures of the Faculty of Graduate Studies.

PhD students in the Department of Earth and Environmental Sciences are required to complete two compulsory courses, EARTH 6300.03: Research Design and Scientific Presentation and EARTH6310.00: PhD Proposal Defence, and an additional 3 credit hours of graduate electives.

Students are required to pass EARTH 6310.00, which normally takes place within the first year of the program. Students who receive “fail” will be asked to withdraw from the PhD program.

Please note that EARTH 6300.03 may be replaced by another 3-credit hours of graduate electives if a student has already taken the course as a part of Department's MSc program.

PhD students are required to present a pre-defence Lecture to the Department within the third year of the program, and to attend all Earth Sciences seminars.

Research leading to the preparation and oral defence of a thesis is required.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

### Required Graduate Courses

EARTH 6300.03: Research Design and Scientific Presentation

EARTH 6350.03: Research Topics in Earth Sciences

EARTH 9000.00: MSc Thesis

EARTH 9530.00: PhD Thesis

### Other Graduate Courses

The following courses are designed specifically for graduate students. They are offered when required, and their content is designed to suit the interests of individual students.

EARTH 6100.03: Seminar in Sedimentology and Stratigraphy

EARTH 6110.03: Research Topics in Micropaleontology

EARTH 6120.03/EARTH 6220.03: Seminar in Mineralogy, Petrology and Geochemistry

EARTH 6250.03: Directed Studies

EARTH 6400.03: Geochronology and Thermochronology

EARTH 6500.03: Graduate Seminar in Tectonics

### Cross-Listed Graduate/Undergraduate Courses

The following courses are designed primarily for undergraduates in their final year; they may be taken by graduate students for general interest, because the material is needed to help in their research, or because the student's background may be inadequate.

PLEASE NOTE: Not all courses are offered every year; please consult the current timetable.

EARTH 5131.03: Advanced Petroleum Geoscience

EARTH 5141.03: Applied Geology, Mineralogy and Geochemistry

EARTH 5151.03: Mineral Deposits

EARTH 5157.03: Petroleum Geoscience Field Methods

EARTH 5270.03: Applied Geophysics

EARTH 5280.03: Marine Geophysics

ERTH 5350.03: Tectonics  
ERTH 5380.03: Advanced Geochemistry  
ERTH 5400.03: Advanced Metamorphic Petrology  
ERTH 5410.03: Environmental Geoscience  
ERTH 5450.03: Introduction to Landscape Simulation  
ERTH 5470.03: Introduction to Seismic Imaging  
ERTH 5480.03: Advanced Seismic Imaging  
ERTH 5502.03: Micropaleontology and Global Change  
ERTH 5520.03: GIS Applications to Environmental and Geological Sciences  
ERTH 5530.03: Environmental Remote Sensing  
ERTH 5600.03: Exploring Geographic Information Systems

## Course Descriptions

### **ERTH 5010 Advanced Topics in Petrology and Geochemistry**

CREDIT HOURS: 3

This course advances students' knowledge of modern aspects of petrology, volcanology, and geochemistry, chosen to reflect instructor and students interests. The focus is on learning thermodynamic and computational methods as well as advanced petrographic work and field mapping for interpretation of igneous and metamorphic rocks.

PREREQUISITES: EARTH 3010 or equivalent, EARTH 3020 or equivalent, or permission of instructor.

CROSSLISTED: EARTH 4010

### **ERTH 5131 Advanced Petroleum Geoscience**

CREDIT HOURS: 3

This is an advanced course in petroleum geoscience applications and interpretation of basin/prospect evaluation. Students work in a team interpreting industry data, including well logs and reflection seismic, in a competitive environment. The team submits its findings and recommendations in written and oral presentations.

PREREQUISITES: Permission of instructor

RESTRICTIONS: Restricted to graduate students in the Department of Earth Sciences

EXCLUSIONS: EARTH 4131.03

FORMATS: Lecture

### **ERTH 5141 Applied Geology, Mineralogy and Geochemistry**

CREDIT HOURS: 3

This course is an introduction to various concepts and techniques used by geoscientists in the search for and evaluation of mineral concentrations, in mining and metallurgy, as well as in environmental aspects of these activities. The successive stages of a mineral exploration project are analyzed, from reconnaissance through exploration geochemistry, claim staking, drilling, mining, estimation of reserves, grades and tonnage, economic aspects, to mine site rehabilitation. Fundamentals of applied ore microscopy will be introduced, with emphasis on metallurgy, and acid rock drainage (ARD) prevention. The syllabus will vary somewhat from year to year to reflect the interests and backgrounds of the students, and the availability of visiting lecturers. The labs will consist of hands-on exercises, visits to analytical labs, problem solving, report writing, and seminar presentations by the students.

PREREQUISITES: EARTH 2001.03, EARTH 2002.03, EARTH 2110.03

FORMATS: Lecture | Lab

### **ERTH 5151 Mineral Deposits**

CREDIT HOURS: 3

This course is an introduction to the geology of metallic ore deposits (e.g., gold, copper) and some industrial mineral concentrations (e.g. diamonds, barite), and the genetic hypotheses used in their exploration. Emphasis is given to the chemical, mineralogical, physical, structural, tectonic, igneous, sedimentary and metamorphic processes that lead to economic concentrations of minerals and their subsequent modification or destruction. The course integrates many Earth Science disciplines, and requires extensive reading from the scientific literature, writing, and oral presentations.

FORMATS: Lecture | Lab

### **ERTH 5157 Petroleum Geoscience Field Methods**

CREDIT HOURS: 3

This course provides an advanced-level overview of petroleum systems and petroleum geology field methods including basin analysis, source rock evaluation, seismic and well log sequence stratigraphy and depositional facies analysis, biostratigraphy, drilling, and completions, petrophysics and well log analysis in addition to other topics. The course comprises lecture, presentations, and a one-week field seminar.

RESTRICTIONS: Restricted to graduate students in the Department of Earth Sciences

EXCLUSIONS: EARTH 4157.03

FORMATS: Lecture | Seminar

### **ERTH 5270 Applied Geophysics**

CREDIT HOURS: 3

The application of geophysical methods to petroleum and mineral exploration as introduced in 2050.03 is here treated at a more advanced level with an emphasis on seismic techniques. Assignments involve the student in interpretation of industry geophysical data and modelling on workstations.

FORMATS: Lecture

### **ERTH 5280 Marine Geophysics**

CREDIT HOURS: 3

The application of the various geophysical techniques to the study of the sea floor and the principal results obtained are examined. The processes involved in the creation, evolution and destruction of ocean basins and the implications of the experimental observations are also considered.

FORMATS: Lecture | Lab

### **ERTH 5350 Tectonics**

CREDIT HOURS: 3

This is a required course for Earth Sciences Honours students. It is intended to synthesize the various aspects of geology covered in the third-year core program. The focus of the course is on tectonic processes and the ways in which these processes create and modify the Earth's crust. We will cover the fundamental geological, geophysical, and geochemical controls that operate today, including plate tectonics, and the ways in which these might have differed in the geological past. The tectonic evolution of specific orogenic belts will be discussed, including both modern and ancient examples in Canada and other parts of the world.

FORMATS: Lecture

### **ERTH 5380 Advanced Geochemistry**

CREDIT HOURS: 3

A basic understanding of Geochemistry is essential to a professional geoscientist who must deal with earth materials, igneous, metamorphic, and hydrothermal processes that take place under the surface of the earth and other planetary bodies, and on the minerals, rocks, fluids, and mineral deposits resulting from these processes. Equally important is a familiarity with the geochemistry of weathering, acid rock drainage (ARD) and the cycles of environmentally significant elements in ground and surface waters. This course begins with an overview of atoms, ions, and isotopes, and the principles that govern their distribution on the Earth and other planets. This will be followed by a discussion of high- and low-temperature aqueous geochemistry, and the applications of chemistry to igneous and metamorphic systems. A section on mineral deposits will examine the formation of hydrothermal ore deposits, and geochemical exploration methods. The latter half of the term will concentrate on low-temperature geochemistry, with an emphasis on processes that control the release, mobility, and fate of contaminants in the environment. Computer models and case studies will be used to illustrate the importance of geochemical data for solving real-world environmental problems. Students will also be introduced to a number of closely related disciplines including surface science, geomicrobiology, and medical geology.

CROSSLISTED: EARTH 4380.03

FORMATS: Lecture | Seminar

### **ERTH 5400 Advanced Metamorphic Petrology**

CREDIT HOURS: 3

This course deals with selected topics in metamorphism and micro tectonics, chosen to reflect current topics of interest in the disciplines and/or specific interests of participants. The focus is on the interaction of metamorphism and deformation, and on the constraints provided by microstructural and metamorphic data on tectonic processes in general. Examples of topics that might be covered include: porphyroblast-matrix relationships in metamorphic rocks; quantitative P-T methods in metamorphism; geochronology of metamorphic rocks; construction and interpretation of metamorphic P-T-t paths; intracrystalline deformation, recrystallisation, and deformation mechanisms in some common rock forming minerals; origin and interpretation of lattice-preferred orientation; natural micro gauges. The course is offered as numbers warrant (4 students minimum). It is suitable for students who are doing honours or graduate work in the general areas of metamorphic and/or structural geology and/or tectonics.

PREREQUISITES: EARTH 3020.03, EARTH 3140.03 or equivalent, or permission of instructor

CROSSLISTED: EARTH 4400.03

FORMATS: Lecture

### **ERTH 5410 Environmental Geoscience**

CREDIT HOURS: 3

Environmental geoscience integrates various aspects of earth sciences to critically examine the interaction between humans and the geologic environment. Topics include environmentally sensitive elements and minerals, geologic hazards, water, soil, mineral and energy issues, use of isotopes as tracers, as well as waste management, radioactivity, and the urban environment.

PREREQUISITES: Completion of undergraduate degree in earth sciences or equivalent

CROSSLISTED: ERTH 4410.03

### **ERTH 5450 Introduction to Landscape Simulation**

CREDIT HOURS: 3

We examine different approaches to numerical modelling of earth-surface processes such as erosion and landslides, melting permafrost, and braided rivers. Using class and/or individual projects as examples, the selection of variables, sensitivity testing, and methods for testing models against nature are discussed. We use Matlab; programming experience is very useful but not essential.

PREREQUISITES: ERTH 3440.03 PHYC 1280.03/1290.03 or PHYC 1300X/Y.06, MATH 1000.03 and MATH 1010.03

CROSSLISTED: ERTH 4450.03, GEOG 4450.03

FORMATS: Lecture | Seminar

### **ERTH 5470 Introduction to Seismic Imaging**

CREDIT HOURS: 3

This course teaches the basic techniques of the reflection seismic method for imaging of earth structures such as those used in hydrocarbon exploration. Lectures introduce concepts and techniques that are applied in computer lab to the processing of a multi-channel seismic dataset. Concepts covered include source and receiver geometry, digital filtering, deconvolution, velocity analysis, stacking, and migration.

PREREQUISITES: Consent of instructor

CROSSLISTED: ERTH 4470.03, OCEA 4470.03, OCEA 5470.03, PHYC 4470.03, PHYC 5470.03

FORMATS: Lecture | Lab

### **ERTH 5480 Advanced Seismic Imaging**

CREDIT HOURS: 3

This course teaches more advanced techniques of seismic imaging of earth structures. Lectures introduce techniques that will be applied in the computer lab to the processing of multi-channel reflection and wide-angle refraction seismic datasets. Concepts covered include multiple removal, pre-stack migration in time and depth, amplitude analysis, velocity modeling and inversion.

CALENDAR NOTES: This course is not offered every year. Please consult department in the spring for further information.

PREREQUISITES: ERTH 4470.03 or consent of instructor

CROSSLISTED: ERTH 4480.03, OCEA 4480.03, PHYC 4480.03, PHYC 5480.03

FORMATS: Lecture | Lab

### **ERTH 5502 Micropaleontology and Global Change**

CREDIT HOURS: 3

This course provides a systematic study of major groups of microfossils (principally foraminifera, Ostracoda and calcareous nanoplankton). Particular emphasis is placed on the distribution and ecology of recent microfossils, and on laboratory techniques for sampling and studying them. Quaternary paleo-oceanography and faunal distribution is examined based on knowledge of the tolerances of the living organisms.

FORMATS: Lecture | Lab

### **ERTH 5520 GIS Applications to Environmental and Geological Sciences**

CREDIT HOURS: 3

Geographic information systems (GIS) provide a rich set of new tools to the geologist and environmental scientist, not only to solve conventional problems, but also to explore questions not readily answered by other means. This course builds on the fundamentals of GIS taught in ERTH 3500.03 to explore analytical tools that aid in decision-making processes encountered in mineral exploration, hydrogeology, site selection, environmental assessment, and global change analysis. The course concentrates on case studies and problem solving, including those requiring multi-criteria and multi-objective decision making processes.

PREREQUISITES: Permission of Instructor

RESTRICTIONS: Restricted to graduate students in the Department of Earth Sciences

EXCLUSIONS: ERTH 4520.03, GEOG 4520.03



### **ERTH 5530 Environmental Remote Sensing**

CREDIT HOURS: 3

This course introduces remote-sensing techniques that provide environmental and geoscience information. The potential and limitations of remotely sensed data are stressed. Lectures discuss the fundamentals with an emphasis on multi-spectral satellite systems. Laboratory exercises include digital image enhancement and thematic information extraction on optical, radar, and hyperspectral data. Remote-sensing information and GIS techniques are integrated throughout the course.

PREREQUISITES: EARTH 5600.03 OR Permission of Instructor

RESTRICTIONS: Restricted to graduate students in the Department of Earth Sciences

EXCLUSIONS: EARTH 4530.03

FORMATS: Lecture | Lab

### **ERTH 5600 Exploring Geographic Information Systems CREDIT HOURS: 3**

Geographic Information Systems (GIS), as a tool for the management of georeferenced data, have become indispensable for disciplines where location of objects and pattern of processes is important. GIS plays a fundamental role for a wide range of applications, from modeling to analysis and predictions, to decision making. The course is designed for a broad base of potential users and draws on examples of the role of GIS in global climate change, mineral exploration, preservation of biodiversity, coastal zone management, resource depletion, and many other present and future environmental issues. The course material will be of interest to those studying geoscience, environmental science, ecology, marine biology, oceanography, epidemiology, urban and rural planning, civil engineering, and any other field involving spatial data. Students are expected to complete and present a GIS project related to their field of research. Laboratory exercises emphasize the principles of raster and vector GIS, and the integration of databases and GPS (global positioning systems) data into GIS. Exercises draw on the diversity of GIS applications in a number of topical areas.

PREREQUISITES: Permission of the instructor

RESTRICTIONS: Restricted to MSc and PhD students in the Department of Earth Sciences

EXCLUSIONS: EARTH 3500.03, EARTH 5600.03, GEOG 3500.03 OR SCIE 3600.03

FORMATS: Lecture | Lab

### **ERTH 6100 Seminar in Sedimentology and Stratigraphy**

CREDIT HOURS: 3

FORMATS: Seminar

### **ERTH 6110 Research Topics in Micropaleontology**

CREDIT HOURS: 3

### **ERTH 6120 Seminar in Mineralogy, Petrology and Geochemistry**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to EARTH 6220

### **ERTH 6250 Directed Studies**

CREDIT HOURS: 3

FORMATS: Lecture | Seminar | Experiential Learning

### **ERTH 6300 Research Design and Scientific Presentation**

CREDIT HOURS: 3

The focus is on preparing and presenting a short research (thesis) proposal, using a format based on NSERC Discovery Grant proposals. Most "in class" time is spent on research design, related topics such as critical reading and error analysis, and on student presentations of the various components of their proposals. Limited instruction in effective writing and presentation will be given in class, with extensive written feedback from the course instructors and classmates on oral and written assignments. Attendance at departmental seminars is compulsory.

PREREQUISITES: Students must be registered in a graduate programme (MSc or PhD) in Earth Sciences, which normally requires a B.Sc. (Honours) in Earth

Science or its equivalent; other students may be admitted with the permission of the instructors.  
RESTRICTIONS: This course is restricted to current graduate students in the Department of Earth Sciences  
FORMATS: Lecture | Seminar

### **ERTH 6310 PhD Thesis Proposal Defence**

CREDIT HOURS: 0

This course includes the defence of the PhD thesis proposal, as developed in ERTH 6300, and is mandatory for all PhD students. The main purpose is to ensure that the student has a thorough understanding of the fundamentals in the student's chosen area of study and has attained an adequate level of knowledge in the discipline (of general and supporting science) to achieve the thesis goals. The PhD proposal defence consists of questions from the Examining Committee on all components of the student's PhD proposal to meet the above objective.

COREQUISITES: ERTH 6300.03

### **ERTH 6352 Research Topics in Earth Sciences**

CREDIT HOURS: 1.5

This course consists of modules that present topics of interest to students coming into the graduate program from a variety of backgrounds. The Geology of Nova Scotia Module is given each year and consists of lectures given by invited speakers and illustrative field excursions. The content of the other modules may change from year to year. Past and potential future topics include: Uranium Series Disequilibria, Mars Surface Processes, Radiometric Dating, Origin of Orogens, Basics of Basins, P-T-t Data from Orogenic Belts, Heat Flow, Granites - Physical and Chemical Processes, Mantle Petrology - Peridotites, Eclogites etc., Abnormal Fluid Pressures in Geology, Environmental Monitoring in Coastal Areas, Quaternary Geology of Nova Scotia, Chemical Weathering, Tectonic Geomorphology, Applications of Cosmogenic Isotopes. Consult website at <http://www.dal.ca/faculty/science/earth-sciences.html> for a list of modules offered in current sessions.

COREQUISITES: Students should also be enrolled in ERTH 6301/6302 (Research Design and Scientific Presentation) although in unusual situations the classes may be taken in consecutive years.

PREREQUISITES: Students must be registered in a graduate programme (M.Sc. or Ph.D.) in Earth Sciences, which normally requires a B.Sc. (Honours) in Earth Science or its equivalent; other students may be admitted with the permission of the instructors.

### **ERTH 6353 Quantitative Methods in Earth and Environmental Sciences**

CREDIT HOURS: 3

This course introduces quantitative methods and their applications in Earth and Environmental Sciences including data analysis, numerical modeling methods, inversion methods, etc. One instructor will lead this course focusing on fundamental theories and methods. Faculty members in the department will take turns to give lectures on applications in their fields.

CALENDAR NOTES: It is recommended that students have a working knowledge of one or more programming languages (such as MATLAB, Python, or R).

PREREQUISITES: Students must be current students majoring in Earth and Environmental Science and require permission from the primary instructor before they register for the course.

RESTRICTIONS: This course is restricted to current graduate students majoring in Earth and Environmental Science.

FORMATS: Lecture | Lab

### **ERTH 6400 Geochronology and Thermochronology**

CREDIT HOURS: 3

Researchers across the whole spectrum of earth science use chronometers, which provide information about the rates of geological processes in areas as diverse as the deep crust and modern surface environments. Experience will be attained on a wide range of chronometers including U-Th-Pb, Ar-Ar, Apatite Fission Track, and (U-Th)/He thermochronology, cosmogenic and nuclide exposure dating, luminescence dating, and radiocarbon dating. The structure and content of the course will vary with instructor and student interests, but will feature lectures, seminars, workshops, laboratory work, and computation.

PREREQUISITES: Students must be registered in a graduate program (MSc or PhD) in Earth Sciences, which normally requires a BSc (Honours) in Earth Sciences or its equivalent. Other participants may be admitted with permission of the instructors.

FORMATS: Lecture | Lab

### **ERTH 6500 Graduate Seminar in Tectonics**

CREDIT HOURS: 3

### **ERTH 6701 Earth Sciences Graduate Internship**

CREDIT HOURS: 3

The Earth Sciences Graduate Internship consists of a 12- 16-week placement with a company or organization involved in Earth Sciences. It is the responsibility of the student to secure a placement, and approval of the placement by the student's supervisor and the graduate coordinator is required.

The internship offers graduate students the opportunity to expand upon classroom learning by gaining practical industry experience. At the end of the internship, a report and presentation must be completed in order to gain course credit.

PREREQUISITES: Permission of Supervisor and Graduate Coordinator

### **ERTH 6702 Earth Sciences Graduate Internship**

CREDIT HOURS: 3

The Earth Sciences Graduate Internship consists of a 12- 16-week placement with a company or organization involved in Earth Sciences. It is the responsibility of the student to secure a placement, and approval of the placement by the student's supervisor and the graduate coordinator is required. The internship offers graduate students the opportunity to expand upon classroom learning by gaining practical industry experience. At the end of the internship, a report and presentation must be completed in order to gain course credit.

PREREQUISITES: Permission of Supervisor and Graduate Coordinator

### **ERTH 8891 Co-op Work-Term I**

CREDIT HOURS: 0

### **ERTH 8892 Co-op Work-Term II**

CREDIT HOURS: 0

### **ERTH 8893 Co-op Work-Term III**

CREDIT HOURS: 0

### **ERTH 8894 Co-op Work-Term IV (optional)**

CREDIT HOURS: 0

### **ERTH 9000 MSc Thesis**

CREDIT HOURS: 0

Students in the MSc Program must be registered in this course in fall, winter, and summer term.

### **ERTH 9530 PhD Thesis**

CREDIT HOURS: 0

Students in the PhD Program must be registered in this course in every fall, winter, and summer term.

## **Economics**

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6214 University Avenue

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2026

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# Staff

## Chairperson of Department

Iskan, T.

## Faculty Advisors

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Warman, C., Graduate Coordinator (MA/PhD), (902) 494-2026, [econgrad@dal.ca](mailto:econgrad@dal.ca)

## Professors Emeriti

Lesser, B., BComm (Hons) (Dalhousie), MA, PhD (Cornell)

## Professors

Akbulut-Yuksel, M., BSc (METU), PhD (Houston)

Burton, P., BSc (Saskatchewan), MA, PhD (UBC)

Iskan, T. B., BA (METU), MA, PhD (Cornell)

Osberg, L., BA (Hons) (Queen's), MPhil, PhD (Yale), McCulloch Professor of Economics

Phipps, S., BA (Hon) (Victoria), MA, PhD (UBC), Maxwell Professor of Economics

Tumennasan, N., BA (Nat Univ of Mongolia), MA (Colorado-Denver), AM, PhD (Brown)

Warman, C., BA (Combined Hons), MA, PhD (Carleton)

Xu, K., MBA, PhD (Concordia)

## Associate Professors

Cyrus, T., BA (UCLA), PhD (Berkeley)

Giusto, A., Laurea in Economics (Bologna), PhD (Oregon)

Kotlyarova, Y., Dip. Software Eng (Lviv Poly. Inst.), MSc (Univ of Illinois-Urbana), PhD (McGill)

Okoye, C., BA (Hons), PhD (UWO)

Rosenblum, D., BA (Williams), MA, MPhil, PhD (Yale)

Yuksel, M., PhD (Houston)

Zhou, W., BE, MA (Tokyo Institute of Technology), PhD (UBC)

## Assistant Professor

McNeil, J., BA (Hons) (Carleton), MA, PhD (Queen's)

## Adjuncts (FGS)

Cross, M. L., AA (Dawson College), BA (Hons) (Montana), MA (SFU), PhD (Texas A&M)

Dasgupta, S., BA (Calcutta), MA (Delhi), MA, PhD (Rochester)

Kivinen, S., BA (Hons) (Lakehead), MA (Simon Fraser), PhD (Queen's)

McAllister, R. I., MA (Oxon), MA (Cantab), Dalhousie (retired)

Rankaduwa, W., BA, MSc (Sri Lanka), MA, PhD (Dalhousie), UPEI

## Senior Instructors

Boulatoff, C., PhD (Utah State)

Forsdyke, R., Bsc (H) Biochemistry, BEd, MA (Queen's), PhD (Simon Fraser)

## Instructor

Ntantamis, C., Dip. Naval Arch. & Mar. Eng. (Nat. Tech. Univ. Athens), MSc (Piraeus), PhD (McGill)

Shamsuddin, M., BA (Lafayette), PhD (Georgetown)

# Master of Arts (MA)

## Admission Requirements

Candidates must at a minimum satisfy the general requirements for admission as spelled out in the [Faculty of Graduate Studies Regulations](#). Entrance to a one-year MA Program requires an Honours BA or BSc in Economics (or equivalent) with an average of at least B+ (upper second-class) at Dalhousie standards in Economics and related fields. Normally this means completion of at least 48

credit hours in Economics beyond the introductory level including courses in Microeconomic and Macroeconomic Theory beyond the intermediate level, Statistics, Econometrics, and courses in applied areas of economics. Mathematics courses which are equivalent to Dalhousie MATH 1000.03: Differential and Integral Calculus I, MATH 1010.03: Differential and Integral Calculus II and MATH 2030.03: Matrix Theory and Linear Algebra I are also required.

Applicants must satisfy the English Language proficiency requirements of Dalhousie. For more information, see “English Language Proficiency” under “[Admissions Requirements](#)” for the Faculty of Graduate Studies.

Areas of specialization for the MA are open, subject to the fields of economics represented in the graduate course offerings in any given year and/or the ability of students to arrange a research supervisor.

Approval by the department and the Faculty of Graduate Studies is required for the program of each student.

Those with insufficient background in economics may be admitted to the MA program with additional course requirements to satisfy the gap in economics preparation, which may extend the degree beyond one year. Alternatively, such students may be given the option of a being a Qualifying Year student or Special Undergraduate student to prepare them to qualify for admission to the MA program.

### ***Completion of MA Program***

Students must successfully complete the required and optional courses of their program. Normally a course of study includes:

- Math Workshop (early in September)
- ECON 5500.03: Macroeconomic Theory
- ECON 5509.03: Microeconomic Theory
- ECON 5575.03: Econometrics I
- Twelve credit hours (4 half-credits) graduate electives in economics
- Three credit hours (1 half-credit) in either a graduate elective in economics or a non-economics graduate elective with approval of the Graduate Coordinator

Students taking the non-thesis option must select at least 6 credit hours of their graduate electives in economics from courses with a writing component consisting of at least 25% of the course work. This currently includes:

- ECON 5000: Development Microeconomics
- ECON 5001: Economic Growth
- ECON 5200: Research Seminar
- ECON 5253: Open Economy Macroeconomics
- ECON 5254: Applied Development Economics
- ECON 5231: Health Economics
- ECON 5330: International Trade
- ECON 5522: Labor Economics
- ECON 5524: Social Policy: Econ Issues, Persp.
- ECON 5252: From Disaster Relief to Devl.
- ECON 5317: Poverty & Inequality
- ECON 5360: Ethics, Justice, and Economics
- ECON 5427: Market Design
- ECON 5440: Time Series

Additional courses may be added through the year. Please contact the Graduate Coordinator for a list of current eligible courses.

Normally the math workshop, ECON 5500: Macroeconomic Theory, ECON 5509: Microeconomic Theory and ECON 5575: Econometrics I and one elective are taken in the fall term, and the remaining electives are taken in the winter term, with the option of a thesis that starts in the winter term and is completed in the summer.

### ***Thesis Option***

Students who excel in the first term and demonstrate superior writing and research ability may, with the permission of the graduate coordinator and a supervisor, choose to write a thesis. Normally, a thesis topic and committee are chosen by the end of the first semester, and, in this case, the student would be required to take three total elective courses rather than five. Students who choose the thesis option are expected to undertake research of innovative, original, and publishable quality.

# Master of Development Economics (MDE)

The Department of Economics hosts this innovative program of graduate studies in social and economic development. The program is primarily designed for students and young professionals pursuing, or intending to embark on, careers in government, educational and professional institutions, private corporations, or non-governmental organizations.

The aim is for an “individualized program,” not “mass production.” Effective development policy and project design and management requires insights from many vantage points and, while development economics is at the core of this program, inputs from other disciplines make important contributions.

## ***Admission Requirements***

The normal duration of the program is one year. All candidates for admission must satisfy the general requirements for admission to the Faculty of Graduate Studies. The Department will only consider applications from candidates possessing an undergraduate degree with an academic average of at least B+ (upper second-class) at Dalhousie standards. Because of the interdisciplinary nature of the MDE, applicants may possess a BA, BSc or BComm degree, but all candidates must have at least four classes in Economics beyond the introductory level, including intermediate economic theory, plus a basic class in statistics and university level mathematics.

Applicants must satisfy the English Language Proficiency requirements of Dalhousie. For more information, see “English Language Proficiency” under “[Admissions Requirements](#)” for the Faculty of Graduate Studies.

Those with insufficient background in economics may be admitted to the MDE program with additional course requirements to satisfy the gap in economics preparation, which may extend the degree beyond one year. Alternatively, such students may be given the option of being a Qualifying Year student or Special Undergraduate student to prepare them to qualify for admission to the MDE program.

## **Completion of the MDE Program**

Students must successfully complete the required and optional courses of their program. A normal course of study includes:

- ECON 5000.03: Development Microeconomics
- ECON 5254.03: Applied Development Economics
- ECON 5001.03: Economic Growth, or ECON 5253.03: Open Economy Macroeconomics
- Three credit hours (1 half-credit) graduate electives in economics
- Twelve credit hours (4 half-credits) in additional graduate electives in economics or, with the approval of the Graduate Coordinator, non-economics graduate electives.

Students who have not taken the equivalent of ECON 3338: Econometrics I, must take this course or an equivalent course in addition to the normal degree requirements.

Normally, ECON 5000: Development Microeconomics and either ECON 5001: Economic Growth or ECON 5253: Open Economy Macroeconomics and two electives are taken in the fall term. ECON 5254: Applied Development Economics and the remaining electives are taken in the winter term, with the option of a thesis that starts in the winter term and is completed in the summer.

## **Thesis Option**

Students who excel in the first term and demonstrate superior writing and research ability may, with the permission of the graduate coordinator and a supervisor, choose to write a thesis. Normally, a thesis topic and committee are chosen by the end of the first semester, and, in this case, the student would only be required to take three total elective courses (9 credit hours), at least of one of which must be in economics, rather than five (15 credit hours). Students who choose the thesis option are expected to undertake research of innovative, original, and publishable quality.

# Doctor of Philosophy (PhD)

## ***Admission Requirements***

Entrance to the PhD program normally requires completion of course requirements for an MA in Economics with an average of at least A- at Dalhousie standards. Students normally prepare for their PhD Comprehensive Exams in two years.

Applicants may be required to submit the results of the Graduate Record Examination in Economics with their application. They should also consult Faculty of Graduate Studies Regulations on “[Admissions Requirements](#)” and English language proficiency.

### ***PhD Program Requirements***

The PhD program is designed to provide students with a strong foundation in economic theory and quantitative methods and intensive work in applied fields of economics. A course of study recommended for the three-year PhD program would include:

#### **Year 1**

- ECON 5500.03: Macroeconomic Theory
- ECON 5509.03: Microeconomic Theory
- ECON 5575.03: Econometrics I
- ECON 6600.03: Advanced Macroeconomic Theory
- ECON 6609.03: Advanced Microeconomic Theory
- three credit hours of graduate economics elective courses
- ECON 9510: Qualifying Exam (Summer)

#### **Year 2**

- ECON 6534.03: Advanced Econometrics
- ECON 6683.03: Special Topics in Advanced Economics. A special topics course must be taken in a PhD student's field of specialization and normally be taught by one or more members of the department who will also be members of the committee responsible for the comprehensive exam in the student's special field.
- six to twelve credit hours of graduate economics elective courses
- ECON 9520: Comprehensive Exam (Summer)

#### **Year 3**

- Thesis research and writing

Students can request from the graduate coordinator a waiver for a course. A waiver shall only be granted if the student can demonstrate that the courses taken elsewhere were at an appropriate level. Approval by the Department and the Faculty of Graduate Studies is required for the program of each student.

After the first two semesters of their course work, candidates for the PhD program will be given a Qualifying Exam in:

- Macroeconomic and microeconomic theory (at the level of Dalhousie Economics courses ECON 5500, ECON 5509, ECON 6600, and ECON 6609)

After the completion of all their course work, candidates for the PhD program will be given a Comprehensive Exam in:

- One field of specialization

Fields of specialization for the PhD are open, subject to the following requirements:

- Applicants to the PhD must clearly indicate on their application the primary field in which they wish to specialize.
- A faculty member in the Department must agree to be the research supervisor for the student before the student is accepted to the program.
- Changes to the student's intended field of specialization after starting the program will also be subject to the agreement of a faculty member in the Department to supervise the student's research in the proposed area of specialization.

### ***Completion of PhD Program***

Qualifying Examinations consisting of written exams in micro and macro-economic theory will be written within a designated one-month period following the successful completion of the first-year micro and macro theory courses (ECON 5500, ECON 5509, ECON 6600, and ECON 6609). A written Comprehensive Exam in one field of specialization will be taken after the completion of all PhD course requirements. Qualifying exams consisting of one microeconomic theory exam and one macroeconomic theory exam typically taken after the first year.

Students are required to present a thesis proposal at a departmental workshop no later than six months after completion of the Comprehensive Exam. One year after completion of the Comprehensive Exam, and on an annual basis, students are required to present their research results at a department workshop.

Finally, a suitable thesis must be submitted and defended.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **ECON 5000 Development Microeconomics**

CREDIT HOURS: 3

This course introduces students to microeconomic models particularly relevant to understanding economics in a developing country context. These models help us to understand some of the difficulties for firms in a developing country and the challenges for individuals and households to emerge from poverty, as well as solutions. Topics may include theories of the household and fertility, labour market models in a developing country context, the environment and development, land markets, credit markets, human capital, technology, and political economy models.

FORMATS: Lecture

### **ECON 5001 Economic Growth**

CREDIT HOURS: 3

Why are some countries much richer than others? Why is income in developed countries so much higher today than it was 100 years ago? Why have poor countries fallen behind, and what can they do to catch-up? Is having a well-educated workforce important for economic growth? The primary aim of this course is to introduce students to the macroeconomics of growth. In the process we would try to provide some answers to the questions posed above. We discuss the theory behind economic growth and also study the quantitative importance of several factors behind growth such as saving, education, as well as technological and institutional change. We will study these factors in isolation and study the interactions between them. Along the way, we also examine the importance of macroeconomic policies.

FORMATS: Lecture

### **ECON 5200 Research Seminar for Masters' Students**

CREDIT HOURS: 3

This course is required for MA and MDE students. The course is intended to advance the work of students on either their thesis or their extended essay (if enrolled in the non-thesis option of their program) and consolidate students' understanding of the research methodology of economics.

FORMATS: Seminar

### **ECON 5231 Health Economics**

CREDIT HOURS: 3

This course introduces students to the role of economics in health, health care, and health policy. The course provides a survey of major topics in health economics and is designed to introduce you to the issues, theory, and practice of health economics. Topics include the economic determinants of health, the role of moral hazard and adverse selection on the market for health insurance, the role of the government in health care, and health care reform. The course is structured in two parts. The format for the first part of the course is lecture based with a more theoretical focus. The second part of the course is designed as a research seminar with a focus on leading research in the field of health economics.

FORMATS: Lecture

### **ECON 5252 From Disaster Relief to Development**

CREDIT HOURS: 3

This course introduces students to the growing literature built around comparative experiences of disaster prevention, relief, and sustainable development. Frameworks for better understanding the reasons behind a cross-section of complex disasters are explored. Ways to improve development planning at both



project and broader community and national policy levels are examined. Main themes include food and clean water, (security of aid distribution, drought reduction); responsible ocean governance; refugees, asylum seekers and settlements for sustainable development; early warning systems for hurricanes, volcanoes, forest fires and famines - their integration into national development planning and emergency programming in the context of global warming, political and economic instability, as well as issues of humanitarian law and peacekeeping. Case studies are routinely drawn from a number of World Bank, UN, EMO, NGO and International Red Cross and Red Crescent experiences, as a part of the course's applied orientation. Follow-up research projects and internship experiences may be facilitated as an extension of this course.

FORMATS: Seminar

### **ECON 5253 Open Economy Macroeconomics**

CREDIT HOURS: 3

The purpose of this course is to build an understanding of contemporary issues in international economics, by providing a formal exposition and discussion of theoretical models for open economy macroeconomics. The topics covered include intertemporal consumption-saving decisions, economic growth, fiscal and monetary policies, and exchange rate models. Building on these theories, a focus will be placed on Developing countries' economies, by comparing their economic growth, discussing foreign debt, and banking crises, and examining the causes and consequences of currency crises.

FORMATS: Lecture | Seminar

### **ECON 5254 Applied Development Economics**

CREDIT HOURS: 3

This course focuses on the theory and evidence of economic development, and from these draws out implications for policy and practice. The aim of this course is to provide an overview of the current literature on the microeconomic foundations of development as well as the literature explaining the macroeconomic factors hindering economic development. Topics covered include the role of human capital (health, education), the functioning of factor markets, the role of institutions in mediating change and paths for sustainable growth, economics of conflict and women empowerment. On the methodological side, we will examine econometric techniques that researchers have used to identify causal relationships (ordinary least square, panel data, instrumental variables, randomized experiments, difference-in-differences, regression discontinuity design).

FORMATS: Lecture | Seminar

### **ECON 5317 Poverty and Inequality**

CREDIT HOURS: 3

Why are some people poor, while others are rich? Why do some nations have more poverty or inequality than others? What can or should be done? This course examines the extent of poverty and inequality in contemporary societies, and the theories underlying alternative measures and explanations.

EXCLUSIONS: ECON 3317.03; ECON 4317.03

FORMATS: Lecture

### **ECON 5330 International Trade**

CREDIT HOURS: 3

This course examines the theory and empirics of international trade. It covers the classical Ricardian theory of comparative advantage, the neoclassical factor proportions theory, and the new trade theories that incorporate increasing returns and productivity differences and discusses empirical testing of these theories. The course investigates the use of trade policy in industrial and developing countries, as well as the institutions that have been developed to regulate those policies.

FORMATS: Lecture

### **ECON 5333 Theories of Economic Development**

CREDIT HOURS: 3

This course focuses on the application of economic theory to issues in economic development at the micro and macro level. After reviewing concepts of development, topics to be covered will include: intrahousehold allocation; the functioning of labour and credit markets (with applications to child labour and microcredit); use of common property resources; growth and distribution; development and globalization.

FORMATS: Lecture

### **ECON 5360 Ethics, Justice & Economics**

CREDIT HOURS: 3

Assumptions of Neoclassical economic theory are critically examined with a focus on the ethical and distributional consequences of using markets as an allocation mechanism. We discuss the major conceptions of economic justice, including utilitarianism and social choice theory, Rawlsian egalitarianism, Nozickian libertarianism, Sen's capabilities approach and equality of opportunity.

EXCLUSIONS: ECON 3360.03; ECON 4360.03

FORMATS: Lecture

### **ECON 5427 Market Design**

CREDIT HOURS: 3

The course studies how the organization of centrally administered markets affects their performance. Students learn several mechanisms that are currently used and evaluate their properties. The course has a strong emphasis on applications, e.g., the allocation of students to public schools, interns to hospitals or organ donors to recipients.

EXCLUSIONS: ECON 4427.03

FORMATS: Lecture

### **ECON 5440 Time Series in Economics**

CREDIT HOURS: 3

This is a course in econometrics that focuses on time series models. The topics cover estimation and inference procedures for univariate and multivariate time series models with stationary and nonstationary data, including stationary univariate time series models (ARMA), unit-root testing, vector autoregressive and vector error correction models, autoregressive heteroscedasticity (ARCH/GARCH), and Markov switching models.

EXCLUSIONS: ECON 4440.03

FORMATS: Lecture

### **ECON 5500 Macroeconomic Theory**

CREDIT HOURS: 3

This course is an introduction to the contemporary issues in dynamic macroeconomics. The course will survey some of the classical and recent topics excluding monetary issues which are addressed in ECON 5502.03. The topics covered include intertemporal consumption and saving decisions under uncertainty, capital asset pricing models, the theory of investment under uncertainty, Solow growth model, endogenous economic growth, alternative explanations of business cycles, and financial market imperfections.

FORMATS: Seminar

### **ECON 5502 Monetary Theory: Microeconomic Aspects**

CREDIT HOURS: 3

This course focuses on the financial behaviour of four agents: (a) the central bank, i.e. The Bank of Canada, (b) commercial banks, (c) nonbank financial intermediaries, (d) the household and firm. Four important issues will be discussed: (1) the kinds of financial assets created in a modern economy; (2) the way in which money and credit are supplied in the modern economy, particularly the operations of the central bank and of financial intermediaries which enable these institutions to expand or contract the quantity of money and credit; (3) the behaviour of the economic agents who demand and supply financial assets; and (4) the framework in which monetary policy can be analyzed.

### **ECON 5509 Microeconomic Theory**

CREDIT HOURS: 3

This course in microeconomic theory is required in the MA program. Subjects covered include: 1) theory of the firm (technology, cost, profit, maximization, introduction to linear programming, duality, supply); 2) theory of the consumer (utility, expected utility, revealed preferences, demand, integrability); 3) general equilibrium (existence, uniqueness, stability) and welfare economics (classical theorems); 4) theory of the market (pure monopoly, oligopoly, monopolistic competition, game theory).

FORMATS: Lecture

### **ECON 5516 Resource Economics**

CREDIT HOURS: 3

This course is designed as an introduction to the theory and application of resource economics. Topics include: 1) interpersonal and intertemporal decision-making criteria; 2) the basic theory of nonrenewable resource exploitation (including Hotelling's theory of the mine); 3) a basic forestry model (i.e., the Faustmann model) including extensions which allow for benefits that arise from standing forests; and 4) the Gordon-Schaefer model of the fishery and optimal dynamic harvesting. Empirical applications of these models (from the current economic literature) will also be presented.

FORMATS: Lecture

### **ECON 5517 Environmental Economics**

CREDIT HOURS: 3

This course is designed as an introduction to the theory and application of environmental economics. It includes the theoretical analysis of 1) interpersonal and intertemporal decision-making criteria; 2) public goods and externalities (such as pollution) and the advantages/disadvantages of regulatory mechanisms; 3) valuation of environmental benefits or damages (e.g., compensating and equivalent variations); 4) preference revelation (e.g., surveys, hedonic pricing, and travel-cost methods); and 5) anthropocentric valuation of the environment (e.g., existence value, access value, option value and quasi-option value) and the possibility of non-anthropocentric decision making. Empirical analyses will be discussed where the above approaches have been implemented.

FORMATS: Lecture

### **ECON 5520 Economic Applications of Game Theory**

CREDIT HOURS: 3

Game theory and information theory are now used in most aspects of economic analysis and a proper understanding of these approaches has become a necessary condition for accessing much of the current literature. The course includes the study of Static and dynamic games of complete information, Static and dynamic games of incomplete information, moral hazard, adverse selection, and mechanism design.

FORMATS: Lecture

### **ECON 5522 Labour Economics**

CREDIT HOURS: 3

This course provides a survey of modern Labour Economics, focusing on labour supply, human capital theory, structural change in labour markets, trends in poverty and earnings inequality and the policy responses of the 'Welfare State'. Discussion is based on recent journal articles. Students are graded on the basis of essays and a final exam.

FORMATS: Lecture

### **ECON 5524 Social Policy: Economic Issues and Perspectives**

CREDIT HOURS: 3

This course provides an overview of social policy analysis in economics and an in-depth examination of selected topics, for example, income security policy, poverty alleviation and income redistribution, health policy and health determinants. The focus is on Canadian policy in comparative perspectives.

FORMATS: Lecture

### **ECON 5525 Applied Econometrics**

CREDIT HOURS: 3

The course focuses primarily on panel and cross-sectional data methods with a strong emphasis on a hands-on approach to learning statistics and programming techniques. Some topics to be covered include nonparametric techniques, quantile regressions, IV, fixed effect, random effects, selection bias and hazard models.

FORMATS: Lecture

### **ECON 5575 Econometrics I**

CREDIT HOURS: 3

This course is designed to introduce students to commonly used econometric concepts and methods in economic research. It will examine both the classical linear regression model and linear models under more general assumptions (heteroscedasticity, autocorrelation, multicollinearity), with a focus on estimation, inference, and forecasting. It also provides an introduction to asymptotic theory and maximum likelihood approach.

FORMATS: Lecture

### **ECON 5576 Econometrics II**

CREDIT HOURS: 3

This course builds on the material learned in ECON 5575.03. Its primary objective is to extend the student's capabilities to conduct quantitative research in economics and to examine critically the existing literature based on quantitative research. The topics of this course include instrumental variables, maximum likelihood estimation, time series models, panel data models, and nonparametric methods.

FORMATS: Lecture

### **ECON 5800 Financial Economics**

CREDIT HOURS: 3

This course is designed to meet the need of those students who would like to pursue research in financial economics at the graduate level. In this course, we review critically the classical literature in financial literature with a focus on investors' behaviours, the Kelley criterion, portfolio theory, asset pricing models, bond analysis, options, market microstructure, and regime switching models. During the course, each student is expected to select an area of research, review the relevant literature, and write an essay in financial economics.

### **ECON 6534 Advanced Econometrics**

CREDIT HOURS: 3

This is an econometrics course for PhD students. It reviews introductory mathematical statistics including parameter estimation (ML, GMM), hypothesis testing, and asymptotic theory. The parametric and nonparametric models including linear, nonlinear, limited dependent variable, and simultaneous equation models are explored in the context of cross-sectional and time series data.

FORMATS: Lecture

### **ECON 6600 Advanced Macroeconomic Theory**

CREDIT HOURS: 3

The purpose of this course is to understand the structure of the major theoretical frameworks in contemporary macroeconomics. The course addresses issues that mainly relate to the real side of the macroeconomy. Major emphasis is placed on incomplete markets, heterogeneity, income and wealth distribution, and distributional causes and consequences of economic policies.

FORMATS: Seminar

### **ECON 6609 Advanced Microeconomic Theory**

CREDIT HOURS: 3

This course in microeconomic theory is required in the general PhD program. Its list of subjects includes: 1) General Equilibrium (existence, determinateness, stability) and Welfare Economics (classical theorems); 2) special topics in General Equilibrium Theory (intertemporal economies, equilibrium over time, uncertainty, temporary equilibrium, theory of the core and other solution concepts); 3) special topics in Welfare Economics (public goods, externalities, consumer surplus, fair allocations); 4) economics of information (signals and prices, moral hazard, equilibrium configurations).

FORMATS: Seminar

### **ECON 6683 Special Topics in Advanced Economics**

CREDIT HOURS: 3

This course serves as a vehicle for PhD students in their final year of coursework to work at the frontier of their major field of specialization. Content will vary by student and by field of specialization. Course supervision and instruction may be shared by up to 3 members of the Department.

FORMATS: Seminar

### **ECON 9000 MA Thesis**

CREDIT HOURS: 0

### **ECON 9001 Graduate Essay in Economics**

CREDIT HOURS: 0

### **ECON 9510 Qualifying Doctoral Examination**

CREDIT HOURS: 0

FORMATS: Other (explain in comments)

### **ECON 9520 Comprehensive Doctoral Examination**

CREDIT HOURS: 0

# Electrical and Computer Engineering

Location:

'C1' Building  
5269 Morris Street  
Room C1-367  
PO BOX 15000  
Halifax NS  
B3H 4R2

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Fax Number: (902) 422-7535  
Email Address: [ece.ss@dal.ca](mailto:ece.ss@dal.ca)  
Website: [www.ece.dal.ca](http://www.ece.dal.ca)

## Introduction

Of all the various disciplines, perhaps no other branch of engineering can claim to have such an impact on modern society as Electrical and Computer Engineering. The ease, speed, and precision by which electrical energy and electrical signals can be transmitted, transformed, and controlled has significantly enhanced the quality of peoples' lives.

Over the short span of only a few decades, Electrical and Computer Engineering has grown from a study of abstract phenomena to a multi-branch discipline with significant applications in the areas of power systems, communication systems, control systems, computers and electronics, robotics, instrumentation, electrical machines, active and switched-capacitor networks, cardiovascular dynamics, medical instrumentation, bioelectromagnetic, ultrasonic telemetry, design of integrated circuits, microprocessor-based systems.

This rapid growth, coupled with major advances in technology and material science, has made the field very dynamic and these changes pose exciting challenges to today's students, educators and practicing electrical and computer engineers.

## Staff

### Department Head

**Bousquet, J. F.**, BEng (Ecole Polytechnique), MSc, PhD (Calgary), PEng.

### Graduate Coordinator

**Ilow, J.**, BEng (Wroclaw, Poland), MAsC, PhD (Toronto), PEng.

### Professors

**Cada, M.**, Dipl. Ing., MSc, PhD (Prague), PEng. Photonics, optical switching, quantum well devices, nonlinear photonics, multilayer and periodic structures, optical computing, optical image processing, photonic crystals, nanotechnology, optical plasmons.

**Chen, Z.**, BEng (Fuzhou), MSc (Southeast), PhD (Ottawa), PEng, FIEEE, FCAE, FEIC. Electromagnetic modelling and simulation, RF/microwave electronics, antennas, wireless communications, and technology.

**El-Masry, E. I.**, BEng, MSc (Alexandria), PhD (Man), PEng. Low-voltage and low-power analog and mixed-signal integrated circuits (IC's) for audio frequency, IF and RF applications.

**El-Sankary, K.**, BEng (Lu, Lebanon), MSc (Univ of Quebec), PhD (Univ of Montreal), PEng. (Senior Year Project Coordinator). Integrated analog and mixed-signal circuits and systems in CMOS technologies for telecommunication and biomedical application. .

**Gu, J.**, BSc (USTC), MSc (SJTU), PhD (Alberta), PEng. Robotics, biomedical engineering, control systems, intelligent systems. .

**Hughes, F. L.**, BSc (Carleton), MSc, PhD (Newcastle upon Tyne). Energy security, climate change, renewable energy

**Ilow, J.**, BEng (Wroclaw, Poland), MAsC, PhD (Toronto), PEng. Statistical communication theory and wireless networks.

**Leon, L. J.**, BSc, MSc, PhD (Dalhousie), PEng. Computational Electromagnetics, parallel and distributed computing, biomedical engineering, cardiac electrophysiology.

**Ponomarenko, S.**, Dipl., Phyc (Novosibirsk), PhD (Univ of Rochester). Nonlinear photonics. Photonic devices. Optical solitons and similaritons. Free-space and fibre optical communications Ultrashort optical pulses. Self-induced transparency in resonant atomic and nano-particle systems. Optical and microwave field propagation in metamaterials and photonic crystals.

### **Associate Professors**

**Adamson, R.**, PhD (Toronto), Optical and ultrasonic biomedical imaging, therapeutic ultrasound and optics, imaging of the auditory system.

**Bousquet, J. F.**, BEng (Ecole Polytechnique), MSc, PhD (Calgary), PEng. Underwater communications and acoustic sensing, CMOS analog and mixed signal.

**Little, T. A.**, BSc Eng (UNB), MEng (Memorial), PhD (UNB), PEng. Alternate energy generation, electric machines, energy storage systems.

**Ma, Y.**, BSc, MEng (Southeast), MSC, PhD (Alberta), PEng. Micro-Electro-Mechanical Systems (MEMS), CMOS/BiCMOS integrated MEMS and Optical MEMS.

**Sieben, V.**, PhD, (Alberta) PEng. Ocean Sensors, Oil and Gas Instrumentation, Microfluidics, Energy Lab-on-a-Chip Systems.

**Trukhachev, D.**, BSc (Saint Petersburg), PhD (LUND). Telecommunications, networks, information theory and bioinformatics.

### **Assistant Professors**

**Gonzalez-Cueto, J.**, BEng, MScE (LasVillas Cuba), PhD (UNB), PEng. Design and implementation of signal processing techniques and application to biological signals.

**Koleilat, G.**, BSc (Concordia), MASC, PhD (Toronto) Nanomaterials engineering, energy sensing and conversion, photovoltaics.

### **Cross-Appointment**

**Freund, M.**, (From Faculty of Science, Chemistry), PhD

**Hill, I.**, (From Faculty of Science, Physics), BSc, PhD (Queen's)

**Seto, M.**, (From Mechanical Engineering) BSc, MSc, PhD (UBC) PEng

### **Adjunct (FGS)**

**Aly, H.**, BEng, MASC (Egypt), PhD (Dalhousie)

**Gregson, P.**, PhD, F.E.C., PEng (Post-Retirement)

**Hanafi, H.**, PhD (Dalhousie)

**Hines, P.**, BS (Dalhousie), PhD (Univ of Bath)

**MacNeill, A.**, BEng, PhD (Dalhousie)

**McIntyre, M.**, BEng (NSTech), MASC (Waterloo), PhD (Waterloo)

**Nie, H.**, MEng (Tsinghua), PhD (UBC), PEng

**Nguyen-Huu, N.**, BEng (Vietnam), MEng (France), MEng (Spain), PhD (Taiwan), PEng

**Schlegel, C.**, BEng (Switzerland), MSEE, PhD (Notre Dame, US), FIEEE

## **Admission Requirements and Procedures**

### **Graduate Admissions Officer**

**Hillyard, H.**, BA (Dalhousie)

Faculty of Engineering  
Graduate Admissions Office  
5217 Morris Street, 4th Floor  
Halifax, NS B3H 4R2  
Canada

If sending by courier, please note the following contact:

E-mail: [gsr@dal.ca](mailto:gsr@dal.ca)

Phone: 902-494-8431

Masters and doctoral applicants should apply using the forms available at the Faculty of Graduate Studies website [www.dal.ca/faculty/gradstudies/graduate-programs-admissions.html](http://www.dal.ca/faculty/gradstudies/graduate-programs-admissions.html)

A complete application includes official transcripts, two confidential letters of reference, a C.V. (resume), English language competency test scores (if applicable), and a personal statement. Proof of financial support may be requested.

In the personal statement you should present yourself as an applicant, explaining your motivation for pursuing graduate study, your educational background, and anything else which seems relevant to your application. You should explain why you think you would be a good fit for Electrical & Computer Engineering and mention specifically faculty members with whom you are interested in working. If you have a specific idea for your thesis or project, you could describe it, but you should also explain what your research interests are more generally.

**\* supporting documents must be sent directly to the Faculty of Engineering Graduate Admissions Office at the address above.**

In order to be admitted to an academic graduate program, an applicant must be accepted by a professor into their research program, in addition to meeting all the requirements for admission.

## **Master of Applied Science (MASC)**

### **Admissions Requirements**

Candidates must satisfy the admission requirements of the Faculty of Graduate Studies. A candidate to be considered to the Master of Applied Science thesis program must have obtained, with a high scholastic standing, an undergraduate degree in engineering or a degree in science with honours, or the equivalent, from a recognized university.

Candidates for the above degree may be required to take additional undergraduate subjects as a preparation for advanced courses or to give the candidate a suitable engineering background, but such subjects are seldom considered as part of the graduate program.

The Master of Applied Science degree is normally one of the requirements for admission to the Doctor of Philosophy degree program.

### **Program Requirements**

A MASC graduate program is research or thesis based and requires the students to complete a minimum of 4 courses (12 credit hours), the graduate seminar and a research thesis selected upon the advice of the thesis supervisor. Not more than one senior level undergraduate course may be taken as part of the 12-credit hour requirement.

Many of the MASC students are also expected to publish their papers in the peer-reviewed conferences.

### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses.

Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All MASC degree candidates must pass all graduate level courses with a grade of at least B-. Any approved undergraduate course taken by a MASC candidate must be passed with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

At least three-quarters (75%) of the total course requirement must be taken at the University, and at least half (50%) of the total course requirement must be taken in the department.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

The student is required to deliver seminars according to the regulations of the Faculty of Engineering. The seminar requirement involves attending, and participating in, all Graduate Seminars held at the department throughout the duration of the student's residency period, as well as making at least one seminar presentation. The Graduate Coordinator is responsible for organizing the Graduate Seminars, and for deciding whether a student has met the requirement.

A MASC candidate will be required to submit a thesis satisfactory to the Faculties of Graduate Studies and Engineering and to make an oral presentation of the work.

## **Time Requirement**

A candidate for a MASc degree will be required to spend at least twelve months' full-time work on course work and the thesis. All students are required to register each session to maintain eligibility to continue a program of studies. The normal time to complete this program is between 18 and 24 months.

## **Master of Engineering (MEng)**

### **Admission Requirements**

Candidates must satisfy the admission requirements of the Faculty of Graduate Studies. A candidate to be considered to the Master of Engineering (MEng) course work program must have obtained an undergraduate degree in engineering or its equivalent with high scholastic standing from a recognized university.

Please note an MEng is a non-thesis program and does not fulfill one of the requirements for admission to the Doctor of Philosophy degree program. Candidates interested in pursuing a PhD should consult the MASc program information.

### **Program Requirements**

A MEng graduate program is project based and requires the student to complete a minimum of 7 courses (21 credit hours), the graduate seminar requirement, and a project selected upon the advice of the supervisor. Not more than two senior level undergraduate courses may be taken as part of the 21-credit hour requirement.

### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses.

Any course taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All MEng degree candidates must pass all graduate level courses with a grade of at least B-. Any approved undergraduate courses taken by a MEng candidate must be passed with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

At least three-quarters (75%) of the total course requirement must be taken at the University, and at least half (50%) of the course requirement must be taken in the department.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

The student is required to deliver seminars according to the regulations of the Faculty of Engineering. The seminar requirement involves attending, and participating in, all Graduate Seminars held at the department throughout the duration of the student's residency period, as well as making at least one seminar presentation. The Graduate Coordinator is responsible for organizing the Graduate Seminars, and for deciding whether a student has met the requirement.

A MEng candidate will be required to complete a project as a part of the program. The project requires students to perform engineering or research work while undertaking a three to four-month project culminating in a written report. An oral examination of the project must be passed after it has been submitted in satisfactory form.

## **Time Requirement**

A candidate for a MEng degree will be required to spend at least twelve months' full-time work on course work and the project. All students are required to register for each session to maintain eligibility to continue a program of studies. The normal time to complete this program is between 12 and 18 months.

## **Doctor of Philosophy (PhD)**

### **Admission Requirements**



Candidates must satisfy the admission requirements of the Faculty of Graduate Studies. A candidate to be considered to the Doctoral (PhD) thesis program must have obtained a research Master's Degree in engineering from Dalhousie University or any other recognized university, or a Master of Science Degree or its equivalent from a recognized university, acceptable to the Faculty of Engineering (in which case, a candidate may be required to take extra subjects to provide a suitable engineering background).

An application for admission to the graduate program leading to the degree of Doctor of Philosophy should have a superior academic record and previous training or experience which indicates that the candidate should be able to do independent research. Doctoral candidates are not admitted without appropriate funding to support the student and the program of research.

A candidate registered for a MASc degree may be transferred to a Doctoral Degree on the recommendation of his/her department, according to the Regulations of the Faculty of Engineering.

## **Program Requirements**

A Doctoral program is research or thesis based and requires the student to complete a minimum of 4 courses (12 credit hours), the graduate research seminar requirement, written and oral comprehensive exams, and a research thesis selected upon the advice of the thesis supervisor. No undergraduate courses may be taken as part of the 12-credit hour requirement.

Students transferring from the MASc to the PhD program will normally have to also complete the required number of courses in the PhD program they are transferring into, in addition to the courses already taken as a MASc student.

The Doctoral dissertation is expected to contain original research and many of the PhD candidates are also expected to publish their work in peer-reviewed journals.

## **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses.

Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All PhD degree candidates must pass all graduate level courses with a grade of at least B. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

At least three-quarters (75%) of the total course requirement must be taken at the University, and at least half (50%) of the total course requirement must be taken in the department.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

The student is required to deliver seminars according to the regulations of the Faculty of Engineering. The seminar requirement involves attending, and participating in, all Graduate Seminars held at the department throughout the duration of the student's residency period, as well as making at least two seminar presentations. The Graduate Coordinator is responsible for organizing the Graduate Seminars, and for deciding whether a student has met the requirement.

PhD candidates are also required to pass comprehensive examinations which normally take place within the fourth study term. The Supervisory Committee shall be responsible for conducting the comprehensive examinations. The purpose of these examinations are to ensure that the student has a thorough understanding of the fundamentals in the student's area of study and that the student has attained knowledge to an adequate level in the discipline. The comprehensive examination consists of at least two written examination papers and an oral examination conducted to meet the above objective. The written papers are to be set and assessed by examiners recommended by the Supervisory committee. The comprehensive examination shall normally be completed within the fourth session of study from first registration. A student shall be given at least three months' notice of the examination. The topics and results of the examination will be conveyed to the Engineering Graduate Studies Coordinator on the prescribed form and will indicate "pass", "fail", or "re-examination". Recommendation of the examining committee to re-examine shall only be permitted if the failure was marginal. Students receiving a recommendation of "fail" shall be required to withdraw from the program by the Registrar's office. Re-examination of marginal students must be carried out within six months of the initial examination. Students requiring re-examination shall not necessarily be required to rewrite both written examinations. Students given the opportunity to rewrite shall only be permitted to rewrite once.

A candidate will be required, as a major part of the program, to submit a satisfactory thesis embodying the results of original scholarship and independent research. The thesis shall consist of an original investigation or design carried out under the immediate supervision of a supervisory committee in accordance with the Faculty of Graduate Studies Regulations.

As well, all PhD degree candidates must pass an oral examination of the thesis project after it has been submitted in satisfactory form. The oral defence and examination shall be carried out according to Faculty of Graduate Studies procedures.

## Time Requirements

A candidate for a PhD degree will be required to spend at least thirty-six months' full-time work on course work and the thesis. Credit for one calendar year may be granted for a Master's degree or its equivalent. All students are required to register each session to maintain eligibility to continue a program of studies. The normal time to complete this program is between three and four years (36 and 48 months).

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **ECED 5210 Biomedical Instrumentation, Data Acquisition and Analysis**

CREDIT HOURS: 3

This hands-on course is an introduction to computer-based acquisition and analysis of physiological signals relevant to biomedical engineering. In an integrated series of lectures and laboratory projects, students will construct and use instrumentation systems to acquire signals of physiological importance (e.g., temperature, electrophysiological signals, pressure, force, flow, and sound). Issues such as filtering, sensor properties, sampling, aliasing, and frequency analysis will be explored. The first part of the course is structured as a hands-on workshop introducing students to the National Instruments Labview programming language and Labview is used throughout the course to explore signal acquisition and processing topics. Students are expected to complete a final project in which they develop and characterize a biomedical instrument.

CROSSLISTED: BMNG 5210.03

FORMATS: Lecture | Lab | Experiential Learning

### **ECED 5260 Diagnostic Imaging and Radiation Biology**

CREDIT HOURS: 3

This course will discuss the basic principles behind modern medical imaging modalities including the mathematical foundations of image process and image reconstruction from projections. The specific imaging modalities that the course covers are X-ray, CT, PET, MRI, and Ultrasound imaging. Fundamentals of ionizing radiation along with the interaction of radiation with tissue is also described. Students will all be required to perform one Magnetic resonance Imaging lab/report using a bench-top Earth field MRI system.

CROSSLISTED: BMNG 5260.03

FORMATS: Lecture | Lab

### **ECED 6070 Modern Integrated Filters**

CREDIT HOURS: 3

This course deals with the design and implementation of modern analog integrated filters. It covers the following topics: fundamentals of continuous-time and sampled-data active filters, behavioural modeling, and design of operational and transconductance (Gm) amplifiers, advanced design techniques for switched-capacitor filters (including multiple-loop feedback structures), current-mode filters (switched-current filters and log-domain filters).

### **ECED 6130 Advanced Topics in Power Systems**

CREDIT HOURS: 3

Basic concepts. Review of optimization techniques. Linear and non-linear programming. Pontryagin's maximum principle. Fletcher-Powell method, etc. Systems security monitoring. State estimation. Optimal power flow. Real and reactive power optimization. On-line optimization. Load dispatching.

Generator scheduling, maintenance scheduling in hydro, thermal and hydrothermal systems. Some case studies.

### **ECED 6150 Power System Operation and Control**

CREDIT HOURS: 3

Power system load forecasting, contingency evaluation, static state estimation, security assessment, automatic generation control, optimal operation of power systems.

### **ECED 6190 Energy Systems Analysis**

CREDIT HOURS: 3

This course applies systems analysis techniques to assess the major global issues and their relationships with energy, the resources, and technologies available to meet future energy needs, potential sustainable energy futures, and the transformative changes needed to achieve these futures.

PREREQUISITES: Permission of the instructor

FORMATS: Seminar

### **ECED 6221 Analog MOS Design**

CREDIT HOURS: 3

The objective of this course is to provide the basic design concepts and tradeoffs involved in MOS analog integrated circuit design. Design issues associated with MOS devices will be explored while emphasizing quantitative measures of performance and circuit limitations. Topics will be selected from the following: modeling of MOS transistor, operational amplifier, comparator designs, bandgap, Sample and hold, and A/D and D/A converters.

PREREQUISITES: IC Design or by permission of instructor.

### **ECED 6240 Complementary Metal-Oxide-Semiconductor (CMOS) Microelectromechanical Systems (MEMS)**

CREDIT HOURS: 3

This course is intended for graduate students in the field of microelectronics and MEMS. In CMOS-MEMS, the combination of the globally established, standard CMOS technology with the commercially promising MEMS and its advantages over a hybrid solution are introduced. Other topics include the fabrication technology, design techniques, material and device characterization and CMOS based MEMS applications.

PREREQUISITES: IC design or approval of instructor

### **ECED 6250 Environmental Sensors and Instrumentation**

CREDIT HOURS: 3

This course addresses the design of sensors and instruments that rely on interdisciplinary efforts, integrating physics, chemistry, and molecular biology with electrical engineering to realize a complete sensor system. Topics covered include Multiphysics simulation, embedded electronics, optical measurement approaches, micro- and nano-fabrication methods and structures, biogeochemistry, and system-level integration considerations.

PREREQUISITES: none

FORMATS: Lecture

### **ECED 6260 Computer Vision**

CREDIT HOURS: 3

The course will discuss early vision processing including image formation, early processing, edge detection, range determination, determination of surface orientation, optical flow, resolution pyramids for grey-level segmentation, and context dependent edge detection. Scene segmentation, edge aggregation, the Hough transform, edge following, contour following, region growing, and split-and-merge algorithms will be discussed. Motion determination will be covered, including optical flow, motion-based surface orientation and motion-based edge detection, and motion-based segmentation.

### **ECED 6265 Advanced Computer Vision and Image Processing**

CREDIT HOURS: 3

The course will cover modern techniques in computer vision and image processing, including but not limited to statistical pattern recognition, determination of pose from multiple views, velocity-based scene segmentation, determination of depth from monocular views and both space- and time-diversity stereo, uni-modal and multi-modal image registration, feature detection using feature-space clustering, and segmentation and recognition by invariants. Students will be required to prepare papers for presentation in a weekly seminar. This course will meet once weekly for 3 hours. Enrollment is restricted to 7 students.

### **ECED 6324 RF/Microwave System Design for Telecommunications**

CREDIT HOURS: 3

The course provides essential design techniques for radio/microwave links in telecommunication systems. Major topics include review of general radio propagation in free space, over obstacles and in the Earth's atmosphere; the design principles of broadband radio/microwave communication links; design and sizing of satellite earth stations; development of hardware configurations for line-of-sight radio links.

PREREQUISITES: Permission of the instructor.

### **ECED 6330 Computational Electromagnetics**

CREDIT HOURS: 3

This course introduces the theory and applications of numerical techniques employed to solve various electromagnetic structure problems in both time and frequency-domains. Major topics include review of electromagnetic theory, variational approach, finite-difference time-domain (FDTD) method, transmission line matrix (TLM) method, finite element method (FEM), method of moment (MoM), method of line (MoL) and boundary element method (BEM). Projects include applications of different computational techniques to solve electromagnetic problems.

### **ECED 6360 Fiber and Integrated Optics**

CREDIT HOURS: 3

This course introduces the principles and devices of photonics. Major topics include optical waveguides and fibers, light sources, modulation and detection techniques, optical wavelength functionalities, fiber-optic communications, integrated optics and sensors, various applications.

### **ECED 6400 Fundamentals on Nonlinear Optics**

CREDIT HOURS: 3

Introduction covering the following topics: nonlinear refractive index, nonlinear wave equations, some indifference frequency generation, second harmonic generation, optical solitons and their propagation in nonlinear fibres, resonant matter interaction, self-induced transparency, electromagnetically induced transparency, quantum theory of nonlinear optical susceptibility.

PREREQUISITES: ECED 3300 and ECED 4502 or equivalent; ENGM 2062 recommended; or instructor approval

CROSSLISTED: PHYC 6401.03

### **ECED 6530 Random Processes**

CREDIT HOURS: 3

Probability theory: mathematical model, conditional probabilities, random variables, pdf, transformation of random variables, conditional densities, statistical averages. Random processes concept; ensemble, stationarity, ergodicity, correlation and covariance, power spectral density, calculation and measurement of ACF, AVF and PSD, Gaussian random processes, noise. Transmission of random processes through linear systems: time-invariant systems, multiple terminals, Gaussian processes, non-stationary processes.

### **ECED 6550 Digital Signal Processing**

CREDIT HOURS: 3

The course provides an introductory treatment of the theory and principles of digital signal processing, with suitable supporting work in linear system concepts and digital filter design. More specifically, the course deals with the following topics: General concepts of digital signal processing, continuous-time system analysis, Fourier analysis and sampled-data signals, discrete-time system analysis, realization and frequency response of, discrete-time systems, infinite impulse response digital filter design, discrete and fast Fourier transforms, and general properties of the discrete Fourier transform.

### **ECED 6560 Data Communications**

CREDIT HOURS: 3

This course provides a structured introduction to data communications through an examination of existing and proposed data link and network layer protocols. Topics include a brief history of data communications, protocol design for reliable communications, addressing (unicast, multicast, broadcast, and anycast), routing algorithm design, Internet protocols, and IPv6.

### **ECED 6575 Underwater Acoustics Engineering**

CREDIT HOURS: 3

The objective of this course is the analysis and development of modern underwater acoustic processing techniques. Signal processing techniques will be studied to recover signals subject to underwater propagation. The techniques and theory will also take into account hardware impairments and will be geared to satisfy today's ocean technology demands.

PREREQUISITES: Approval from the instructor.

FORMATS: Lecture

### **ECED 6576 Software Defined Radio Design Using Very Large-Scale Integration**

CREDIT HOURS: 3

The objective of this course is to analyze and develop digital radio architectures to satisfy today's market demands. Modern communication architectures will be described for real-time implementation.

PREREQUISITES: Approval from the instructor

### **ECED 6585 Telecommunications Systems**

CREDIT HOURS: 3

This course provides an overview of the current telecommunication systems and their future evolution. Topics will include: the history of the telephone network, the current infrastructure, switching techniques, high speed transport systems Asynchronous Transfer Mode, satellite communications, high bandwidth access technologies, mobile cellular systems, personal communication systems.

### **ECED 6590 Mobile Communication Systems**

CREDIT HOURS: 3

This course provides an overview of mobile communications systems. The course introduces channel characterization for propagation losses, fading, delay spread, and interference. Coding, modulation, and receiver design issues are examined. Cellular mobile system issues such as frequency planning channel access methods and handoff are discussed. Mobile communication system applications are reviewed.

### **ECED 6595 Coding Techniques for Digital Communications**

CREDIT HOURS: 3

Source and channel coding techniques to improve the performance of digital communication systems are examined. The source coding methods to be studied include prediction, block coding, redundancy reduction, and synthesis/analysis coding. Emphasis is placed on channel coding techniques. Waveform coding and error control concepts are covered. Parity check codes, block codes, cyclic codes, convolutional coding and decoding algorithms, concatenated codes and interleaving are studied. Coded modulation techniques are discussed. Applications of coding techniques are presented.

### **ECED 6620 Optimal Control Systems**

CREDIT HOURS: 3

This course introduces three facets of optimal control-dynamic programming, Pontryagin's Minimum Principal, and numerical techniques for trajectory optimization. In all cases, the objective is to determine the optimal controller or algorithm with respect to a specified design index. Digital simulation techniques are widely utilized.

### **ECED 6630 Introduction to Estimation, Identification and Stochastic Control**

CREDIT HOURS: 3

Stochastic processes, Gauss-Markov sequence model, Gauss-Markov process model, optimal estimation for discrete systems, optimal prediction for discrete linear systems, optimal filtering in the presence of time-correlated disturbances and measurement errors, problem formulation and equivalent discrete-time problem.

### **ECED 6640 Mobile Robotics**

CREDIT HOURS: 3

This course is an in-depth study of algorithms in mobile robotics. Topics include motion planning, localization, mapping, navigation, and sensor fusion. Wheeled and legged mobile robots will be covered, and kinematics' models are developed for many of the more common locomotive strategies.

### **ECED 6650 Advanced Topics on Optimization Methods in Engineering and Physics**

CREDIT HOURS: 3

Nature and systems considered in engineering and physics have an abundance of examples where an optimum system status is sought. The course aims to provide the students with advanced theory of optimization and topics that arise in applications of the optimization techniques. The challenge of this course is to increase the utilization of the optimization methods by development and use of appropriate algorithms derived for specific problems in engineering and physics. They include those arising in VLSI design, computer engineering, chemical reactor control, in spin glasses as well as in networking, particularly in networks with frequently changing topology. State-of-the-art of the advanced optimization techniques is presented. Geometric interpretations, time-space decompositions and large- and small-scale considerations are stressed wherever possible.

PREREQUISITES: Permission from instructor

### **ECED 6660 Fuzzy Systems**

CREDIT HOURS: 3

Fuzzy sets and their membership functions, support and alpha level sets are introduced. Basic set-theoretical operations of intersection and union and the concept of compensation are discussed in the context of the algebraic operations including t-norms and s-norms. Fuzzy measures and the extension principle are discussed as the basis for operations on fuzzy numbers. Fuzzy relations, graphs, extrema, integration, and differentiation are treated. Decision theory, linear regression, linear programming applications are discussed.

### **ECED 6810 Neural Networks**

CREDIT HOURS: 3

The course deals with preliminaries of artificial neural systems including fundamental concepts and models. Single layer perception classifiers and multi-layer feed forward networks, single-layer feedback networks, and associative memories are covered.

### **ECED 6900 Graduate Seminar**

CREDIT HOURS: 0

Regular seminars as per the Faculty of Graduate Studies requirement and departmental regulations. See section 5.5 of the Graduate Studies handbook for the Faculty of Engineering as well as Departmental Regulations as provided by the department. Graded pass/fail.

### **ECED 6910 Directed Studies in Electrical and Computer Engineering**

CREDIT HOURS: 3

This course is available to graduate students enrolled in a Master's Degree programme in Electrical and Computer Engineering, who wish to gain knowledge in a specific area for which no graduate-level courses are offered. Students are assigned an advisor and are required to present a formal report, or take a formal examination, at the end of the course.

### **ECED 7610 Semiconductor Integrated Optoelectronics**

CREDIT HOURS: 3

In this course, physical fundamentals, and principles of operation of semiconductor photonic devices and integrated structures are introduced. Structures for optical radiation generation and detection, nonlinear and bistable devices, etc., are studied. Integration of these components onto a common substrate for implementing optoelectronic functions such as modulation, switching, multiplexing, etc., is described. Applications in fast optical signal processing devices, high-performance optical communications systems, and optical computing are addressed.

### **ECED 7900 Graduate Seminar - PhD**

CREDIT HOURS: 0

The graduate seminar course is designed to guide graduate students through their scientific path towards the degree. It introduces the students to important information about graduate studies, safety rules, regulations and practice, library material as well as serving as a teaching assistant in courses. The students are also exposed to research presentations by guest lecturers, ECED professors and instructors and their fellow colleagues – PhD students. The students learn the process of scientific development and presentation of their scientific results.

FORMATS: Lecture

### **ECED 7910 Directed Studies in Electrical and Computer Engineering II**

CREDIT HOURS: 3

This course is available to graduate students enrolled in a PhD programme in Electrical and Computer Engineering who wish to gain knowledge in a specific

area for which no graduate-level courses are offered. Students are assigned an advisor and are required to present a formal report, or take a formal examination, at the end of the course.

### **ECED 8500 MEng Project**

CREDIT HOURS: 0

A Master of Engineering candidate will be required to submit a project satisfactory to the Faculties of Graduate Studies and Engineering and to make a successful oral presentation of the work.

### **ECED 8891 Co-op Work-Term I**

CREDIT HOURS: 0

### **ECED 8892 Co-op Work-Term II**

CREDIT HOURS: 0

### **ECED 8893 Co-op Work-Term III**

CREDIT HOURS: 0

### **ECED 8894 Co-op Work-Term IV**

CREDIT HOURS: 0

### **ECED 9000 Master's Thesis**

CREDIT HOURS: 0

### **ECED 9530 PhD Thesis**

CREDIT HOURS: 0

## **Electronic Commerce**

Location:

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Website: [www.ecomm.dal.ca](http://www.ecomm.dal.ca)

## Introduction

The Faculty of Computer Science, in partnership with the Faculties of Management and Law, offers the degree of Master of Electronic Commerce.

Electronic Commerce is a discipline whose underpinnings lie equally in technology, business, and social and economic policy. Distinct from any of the disciplines that comprise it, this multi-disciplinary two-year program consists of core courses, elective courses, a research project, a research paper/thesis or a research thesis, and an industrial internship. Students study core topics in each of the three areas and can then concentrate on some topics by choosing electives from the Technology, Business, Law and Policy study areas. Visit the Electronic Commerce website at [www.ecomm.dal.ca](http://www.ecomm.dal.ca) for a complete program description and for information concerning updates to the program's regulations and course offerings. Email queries can be addressed to [mec@cs.dal.ca](mailto:mec@cs.dal.ca).

### Please send Graduate Application Documents to:

*This program is no longer accepting applications for admission. This program has been superseded by the Master of Digital Information.*

## Staff

### Program Director

**Keselj, V.**, BSc (Belgrade), MMath, PhD (Waterloo)

### Faculty

**Bodorik, P.**, BSc (Calgary), MEng, PhD (Carleton)

**Currie, R.**, BA (St. FX), MA (Carleton), LLB (Dalhousie), LLM (Edinburgh)

**Deturbide, M.**, BSc (Dalhousie), BJ (King's), LLB, LLM (Dalhousie)

**Gao, Q.**, MAsC, PhD (Waterloo)

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**Watters, C. R.**, BSc, MSc, MLS (Western), PhD (TUNS)

**Zincir-Heywood, N.**, BSc, MSc, PhD (Ege)

### Adjunct Professors

**Lucic, V.**, E.E. Dipl Eng (Nis), MEng, PhD (Waterloo)

## Admission Requirements

*This program is no longer accepting applications for admission. This program has been superseded by the Master of Digital Information.*

Students entering this program will usually have completed a four-year bachelor's program or graduate degree in Computer Science, Computer Engineering, Industrial Engineering, Business, Social Science (e.g., Political Science or Economics), Law, or other related disciplines. All applications are individually evaluated and students from other disciplines may be admitted. No requests for deferrals will be considered.

Students must meet normal admission standards for the Faculty of Graduate Studies (for more information visit [www.dalgrad.ca.ca/admissions](http://www.dalgrad.ca.ca/admissions)).

## Program Outline



The program for full time students requires a minimum of two years to complete and consists of two terms of lectures and two terms of individually supervised research.

### ***Term 1***

The program regularly starts each fall, and we offer several specific introductory courses for electronic commerce each fall term. A full-time student is expected to take four courses, including an eCommerce overview course (ECMM 6000: Overview of Electronic Commerce), usually two of three introductory courses to specific disciplines (ECMM 6010: Technology Issues for Electronic Commerce/ECMM 6020: Business Issues for Electronic Commerce/ECMM 6030: Issues in Law and Policy for Electronic Commerce) which are not in the specialty area of the students, and one elective from computer science, business, or law.

### ***Term 2***

The second term is dedicated to more specific studies leading to the specialization of each student. A full course load consists of four courses, the mandatory research methods course (ECMM 6040: Research Methods) and three electives. Elective courses are graduate courses from Business, Computer Science and Law which are relevant for electronic commerce and some special offerings for electronic commerce (ECMM 60XX). These are typically courses from the list of pre-approved elective courses (see below), but it is also possible to take other relevant courses with the permission of the executive committee.

### ***Breadth requirement***

It is necessary that the electives chosen by each student cover at least two of the three areas in the program. For example, a student who takes mainly business courses must take at least one elective from computer science or law.

### ***Elective Courses***

Candidates may study electives from graduate level courses in the Faculty of Computer Science, School of Business Administration, School of Public Administration, and the Schulich School of Law if appropriate for the program and prerequisites are met.

It is not guaranteed that all courses listed will be offered each academic year.

Approved stream courses include the following:

#### **Technology Oriented Courses**

- ECMM 6014.03: Databases, Data Warehouses and Data Mining for Electronic Commerce
- ECMM 6018.03: Enterprise Networking for Electronic Commerce
- CSCI 6xxx.03 Graduate computer science elective - prerequisite: Permission of instructor or program coordinator

#### **Business Oriented Courses**

- ECMM 6022.03: IT Project Management (recommended)
- ECMM 6024.03: New Venture Creation (prerequisites: permission of instructor)
- BUSI 6313.03: Organizational Change
- BUSI 6420.03: Marketing Informatics
- BUSI 6517.03: Managing the Information Resource (prerequisite: permission of instructor)
- BUSI 6522.03: Knowledge Discovery and Data Mining (prerequisite: permission of instructor)
- BUSI 6516.03: Database Management Systems (prerequisite: BUSI 5511.03: Management Information Systems or permission of instructor)
- BUSI 6409.03: Internet Marketing
- PUAD 6556.03: E-Government: International Experiences and Perspective or ECMM 6026.03: Management of Information (E-Government): International Experiences and Perspectives
- PUAD 6500.03: Business and Government
- INFO 6640.03: Electronic Access to Information
- INFO 6540.03: Database Management Systems
- INFO 6370.03: Records Management

#### **Policy Oriented Courses**

- LAWS 2019.03: Law and Technology (recommended)
- LAWS 2168.03 or ECMM 6068.03: Internet and Media Law (recommended)

Further studies in the law specialization may include:

- LAWS 2130.03: International Trade Transactions
- LAWS 2159.03: Advanced Health Law
- LAWS 2183.03: Privacy Law
- LAWS 2178.03: Intellectual Property

### ***Industrial Internship***

The internship is a placement within an organization related to electronic commerce, or electronic government. The employer agrees to ensure that the content of the placement is related to electronic commerce. Approval of the placement by the electronic commerce Executive Committee is required. It is ultimately up to the student to secure a placement; however, the Executive Committee makes every effort to have a pool of potential placements available for students. Students must have completed at least three core courses and three elective courses (or have received special permission from the electronic commerce Executive Committee) before starting their internship. The Internship is only required in the Research Paper and Research Project option.

### ***Individually Supervised Research Component***

An individually supervised research component is carried out under the supervision of a specialist in an area in which the student wants to specialize. This further study can be related to the internship, but it is academic in nature (e.g., a business case, a survey, or a computer implementation). A written report is expected upon completion.

There are three program options for the research component of the program:

#### **Research Paper + two Additional Electives**

This program option offers the study of a specific topic beyond the typical coverage in a course and requires a written report that is evaluated by a reader from one of the three Faculties of Computer Science, Management, or Law. No public presentation is required, and it is not expected to generate new data or theories. This option must be augmented with two additional elective courses relevant to the area of specialization. This option also requires an Internship.

#### **Research Project**

This program option typically focuses on an implementation of specific solutions or a thorough analysis of a specific topic with a significant contribution and requires a comprehensive report and a public presentation. Research projects will be conducted and evaluated under standard guidelines of the Faculty of Graduate Studies for masters' level projects and requires a supervisor (from any institution) and a reader from one of the three Faculties at Dalhousie (Computer Science, Management, Law) who is a member of the Faculty of Graduate Studies. This option requires an Internship.

#### **Thesis**

Students interested in pursuing a research topic in E-Commerce in more depth may, with approval of the electronic commerce Executive Committee, elect to do a thesis instead of a research project. Such a thesis would be conducted and evaluated under standard Faculty of Graduate Studies thesis guidelines. A thesis must make an original research contribution (see Faculty of Graduate Studies thesis guidelines) of considerable scientific, legal, or management interest that would qualify for a publication in a major conference or professional journal. This option requires a public thesis defense. No Internship is required for this option.

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## **Course Descriptions**

### **ECMM 6000 Overview of Electronic Commerce**

CREDIT HOURS: 3

Electronic commerce deals with the conduct of business using computer and communication technologies. It takes place in an environment shaped by government and business policies as well as social attitudes. The course examines issues in global electronic commerce and an understanding of the impact

of the interaction and interdependencies of technology, business, and policy on electronic commerce.

### **ECMM 6010 Technology Issues for Electronic Commerce**

CREDIT HOURS: 3

The goal of this course is to examine the technologies and infrastructure required to support electronic commerce. The course examines the major components of the infrastructure such as networks, databases and data warehousing, electronic payment, security, and human-computer interfaces.

### **ECMM 6014 Databases, Data Warehouses and Data Mining for Electronic Commerce**

CREDIT HOURS: 3

Data warehousing and data mining are two emerging technologies which will have a profound effect on the role information plays in organizations. A data warehouse is a repository of data taken from multiple sources that supports querying and analysis tools. Data mining, the process of knowledge discovery from data in a data warehouse, is typically used for strategic planning and has great economic potential for organizations. This course covers key issues in data warehouse architecture, design of data warehouse schemas, design of metadata repositories, the creation, development and maintenance of warehouses, as well as tools and techniques for querying, analyzing and mining the warehouse data. Data mining techniques such as statistical and non-statistical supervised and unsupervised learning methods will be applied to problems drawn from the medical and business world.

### **ECMM 6020 Business Issues for Electronic Commerce**

CREDIT HOURS: 3

For years businesses have been using the computer and information technology to achieve internal efficiencies. With the convergence of Information Technology and telecommunications over the last decade, Electronic Commerce has emerged to redefine the way that these organizations do business with their suppliers, customers and support infrastructure such as distribution providers and financial institutions. In particular, the course will examine the recent and rapid growth of Electronic Commerce from four approaches: an introduction to Electronic Commerce; EDI and re-engineering; Electronic Commerce and the Internet; and organizational issues in implementing Electronic Commerce.

### **ECMM 6022 Project Management: A Managerial Approach**

CREDIT HOURS: 3

The course will cover the principles of management for Information Technology Projects. The history of project management is rooted in Civil Engineering and manufacturing. Information technology projects have several notable differences. Students will learn those differences as well as generic principles of project management. Through case studies and field investigations of actual IT projects, students will gain a real-world understanding.

CROSSLISTED: BUSI 6523.03; HINF 6300.03

### **ECMM 6024 New Venture Creation**

CREDIT HOURS: 3

New Venture Creation is about entrepreneurship: the process of creating new businesses. It employs cases, experiential exercises, and a major project to expose students to the issues, problems, and challenges of creating viable new business. The project provides students with the opportunity, within the framework of a formal class, to explore and develop business ideas they have been considering or wish to investigate. The final output of the project is a feasibility study, business plan, and financing proposal for a new venture.

CROSSLISTED: BUSI 6002.03

### **ECMM 6026 Management of Information (E-Government): International Experiences and Perspectives**

CREDIT HOURS: 3

Public administration rhetoric often indicates that governments are re-inventing themselves by using information technology. What is happening around the world with E-government? Using Canada as reference, this course reviews the development of management of information as it affects performance management, democracy, the nation state, accountability, network growth, productivity and access. Each student will be required to analyze an international country, state or province and its progression to e-government and relate that progress to activities in governments around the world.

Some of the topics covered are:

- Introduction to E-Government
- Service to Citizens
- Administration of E-Government
- Social Exclusion in the Digital Age
- Learning and Information Technology
- Knowledge Networks Personal Information and Information Technology

- Collaborative Networks
- The Dark Side of IT

EVALUATION: Each student will be required to analyze a non-Canadian country, state or province and its progression to e-government and relate that progress to activities in governments around the world. Recommendations for improvement should also be made. Each student negotiates with the professor for an appropriate country. Two papers, class participation and a final presentation based on the two papers, will determine the student's grade.  
CROSSLISTED: PUAD 6556.03

### **ECMM 6030 Issues in Law and Policy for Electronic Commerce**

CREDIT HOURS: 3

This course will provide students in the proposed Master of Electronic Commerce degree programme with an overview of law and policy issues in relation to electronic commerce. The course will introduce students to Canadian, U.S. and international policy making institutions and processes, and will illustrate these processes using examples from the emerging domestic and international law relating to electronic commerce. The course will be taught in a lecture format.

### **ECMM 6040 Research Methods**

CREDIT HOURS: 3

A transition to research-based learning for e-commerce students. The course addresses the challenges of the research paper, project, or thesis. Through lectures, seminars, discussion, and presentations, students identify leading e-commerce research topics, evaluate literature critically and produce a research proposal-the foundation to the program's final phase.

### **ECMM 6068 Internet and Media Law**

CREDIT HOURS: 3

This course deals with the law that governs the dissemination of information and the regulation of information providers. In this course, "media" is defined broadly to include the internet. Topics that will be addressed include defamation; liability of service providers; privacy issues; publication bans; media regulation; copyright issues; conducting business via the internet ("e-commerce") and media ownership. The impact of the internet on the legal regulation relating to each of these topics will be explored throughout the course.

### **ECMM 6903 Special Graduate Topics in Electronic Commerce**

CREDIT HOURS: 3

### **ECMM 7010 Industrial Internship**

CREDIT HOURS: 12

### **ECMM 7030 Research Paper in Electronic Commerce**

CREDIT HOURS: 6

### **ECMM 7051 Research Project in Electronic Commerce**

CREDIT HOURS: 12

### **ECMM 9010 Graduate Thesis in Electronic Commerce I**

CREDIT HOURS: 12

## Engineering

Location:

Sexton Campus  
5217 Morris Street  
Room 401  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-6217  
Fax Number: (902) 429-3011  
Email Address: [DeanEng@Dal.ca](mailto:DeanEng@Dal.ca) or [gsr@dal.ca](mailto:gsr@dal.ca)  
Website: [engineering.dal.ca/index.htm](http://engineering.dal.ca/index.htm)

## Introduction

Dalhousie University offers programs leading to Master's and Doctoral degrees in various branches of Engineering, Engineering Mathematics, Food Science and Technology. These graduate programs are offered through the Faculty of Engineering in accordance with the regulations of the Faculty of Graduate Studies and the Faculty of Engineering.

## Staff

### Dean

**Newhook, J.**, BEng, MSc (TUNS), PhD (Dalhousie), PEng

### Associate Dean

**Little, T.**, BSc (Eng) (UNB), MEng (Memorial), PhD (UNB), PEng, Undergraduate and Associated Universities

**Plucknett, K.**, BSc, PhD (Warwick), Research

### Assistant Dean

**El-Sankary, K.**, BEng (LU), MSc (Quebec), PhD (Ecole Polytechnique), Student Affairs

**Ghanem, A.**, BSc (Eng) (UNB), PhD (Cornell), Diversity and Inclusion

### Executive Assistant

**Pottie, A.**

### Graduate Admissions Officer

**Hillyard, H.**, BA (Dalhousie)

## Master of Applied Science (MSc)

### Admissions Requirements

A candidate to be considered to the Master of Applied Science research program must have obtained, with a high scholastic standing, an undergraduate degree in engineering or a degree in science with honours, or the equivalent, from a recognized university.

Candidates for the above degree may be required to take additional undergraduate subjects as a preparation for advanced courses or to give the candidate a suitable engineering background, but such subjects are seldom considered as part of the graduate program.

# Academic Regulations

## ***Program Requirements***

A MASc graduate program consists of not less than 12 credit hours or the equivalent, the graduate seminar and thesis selected upon the advice of the thesis supervisor. Not more than one senior level undergraduate course may be taken as part of the 12-credit hour requirement.

## ***Examination Requirement***

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses with a grade of at least B-. Any approved undergraduate course taken by a Master's candidate must be passed with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

As well, all Master's degree candidates must pass an oral examination of their thesis or project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

## ***Time Requirement***

A candidate for a Master's degree will be required to spend at least twelve months' full-time work on course work and the thesis. All students are required to register each session to maintain eligibility to continue a program of studies. See [Faculty of Graduate Studies Regulations](#) for policies regarding the maximum length of time for degree completion and extensions.

# Master of Engineering (MEng)

## **Admission Requirements**

A candidate to be considered for the Master of Engineering course work program must have obtained an undergraduate degree in engineering or its equivalent with high scholastic standing from a recognized university.

## **Academic Requirements**

### ***Program Requirements***

The requirements for the course work Master of Engineering degree is not less than 21 credit hours, the graduate seminar and the six credit hours project. Undergraduate courses, in the area of a student's interest, not taken by the student for previous credit, may be included in the program, subject to prior approval. Not more than 12 credit hours may be undergraduate credit hours.

A project is required as a part of the program (three or six credit hours out of the required 27 credit hours). Projects require the appointment of a supervisor and one supervisory committee member.

Individual departments will assess applicants and select students for the program in their respective departments. Students' programs will be determined by the department in which the student is registered. All programs must have the approval of the department.

### ***Examination Requirement***

All courses required to meet the degree requirements are considered essential courses. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses with a grade of at least B-. Any approved undergraduate course taken by a Master's candidate must be passed with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

As well, all MEng degree candidates must pass an oral examination of their project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

#### ***Time Requirement***

The minimum time requirement for completing the program is twelve months. A student is required to register each session to maintain eligibility to continue his/her program of studies. See [Faculty of Graduate Studies Regulations](#) for policies regarding the maximum length of time for degree completion and extensions.

## **Master of Engineering (MEng) Biological, Chemical, and Industrial**

### **Admission Requirements**

For a candidate to be considered for the Master of Engineering in Biological, Chemical and Industrial Engineering programs, they must have obtained an undergraduate degree in engineering or a related discipline with high scholastic standing from a recognized university. Applicants with industrial experience are encouraged to apply.

### **Academic Requirements**

#### ***Program Requirements***

The course requirements for the Master of Engineering Biological, Chemical and Industrial is not less than 27 credit hours and the graduate seminar. Undergraduate courses, in the area of a student's interest, not taken by the student for previous credit, may be included in the program, subject to prior approval. Not more than 12 credit hours may be undergraduate credit hours. Up to 6 credit hours of the program requirements may be completed in the form of an optional project requiring appointment of a project supervisor and presentation of the project results within the graduate seminar. Students should seek advice from the program coordinator if they intend to pursue this option.

Individual departments will assess applicants and select students for the program in their respective departments. Students' programs will be determined by the department in which the student is registered. All programs must have the approval of the department.

#### ***Examination Requirement***

All courses required to meet the degree requirements are considered essential courses. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses with a grade of at least B-. Any approved undergraduate course taken by a Master's candidate must be passed with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

MEng degree candidates choosing to complete the optional 6 credit hour project as part of their 27-credit hour program requirement must present their work within the graduate seminar.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

#### ***Time Requirement***

The minimum time requirement for completing the program is twelve months. A student is required to register each session to maintain eligibility to continue his/her program of studies. See [Faculty of Graduate Studies Regulations](#) for policies regarding the maximum length of time for degree completion and extensions.

## **Master of Engineering (MEng) Internetworking**

## **Admission Requirements**

A candidate to be considered for the Master of Engineering in Internetworking program must have obtained an undergraduate degree in engineering or its equivalent with high scholastic standing. Applicants with industrial experience are encouraged to apply.

## **Academic Requirements**

### ***Program Requirements***

The course requirement for the Master of Engineering in Internetworking is 50 credit hours.

The program director or designates will assess applicants and select students for the limited number of seats available in the program. The program of study of each student will consist of the ten program courses in the approved sequence.

### ***Examination Requirements***

The ten program courses are considered required courses. All degree candidates must pass all courses with a grade of at least B-.

A project is optional. Students should seek advice from the Internetworking office.

Candidates will be required to pass an oral examination of their project after the report has been submitted in a satisfactory form.

### ***Course Scheduling***

The courses are normally scheduled in six-week blocks, two courses per term.

This delivery method has been chosen to accommodate the sequential nature of the program content.

## **Master of Science (MSc) Engineering Mathematics**

## **Admission Requirements**

For admission into the Master of Science program in Engineering Mathematics, a student must have completed with high standing, a Bachelor's degree in Engineering or an honours (i.e., four year with research project or dissertation) Bachelor's degree with at least two full year mathematics courses at the third-year level, one of them in differential equations.

Applicants who do not meet the above requirements may be admitted to a Qualifying Program in which they would take additional courses which will raise their total preparation to the level of an honours degree. These additional courses and completion of the Qualifying Program will be considered a prerequisite to admission to the Master of Science program.

## **Academic Regulations**

### ***Program Requirements***

The program will consist of at least 12 credit hours and a thesis selected upon the advice of the thesis supervisor. Not more than six credit hours shall be at the final year undergraduate level and may be chosen from the offerings of the other Departments of the Faculty of Engineering and the Faculty of Computer Science.

### ***Examination Requirement***

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses with a grade of at least B-. Any approved undergraduate course taken by a Master's candidate must be passed with a grade of at least B-. Graduate students are allowed to repeat only one course during their program at Dalhousie. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

As well, all Master's degree candidates must pass an oral examination of their thesis or project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.



### ***Time Requirement***

A candidate for the degree of Master of Science in Engineering Mathematics will require at least 12 months to complete the degree. A student is required to register each session to maintain eligibility to continue his/her program of studies. See [Faculty of Graduate Studies Regulations](#) for policies regarding the maximum length of time for degree completion and extensions.

## **Master of Science (MSc) Food Science**

### **Admission Requirements**

For admission into the Master of Science Program in Food Science, students must have a BSc degree from any recognized university in any of the following disciplines:

- Food Science;
- Dairy Science;
- Chemistry/Biochemistry;
- Microbiology;
- Nutrition or Home Economics with suitable background;
- or a Bachelor of Engineering.

Students will be considered for the program on the basis of undergraduate academic standing and background. Candidates without Food Science training at the undergraduate level will likely be required to attend appropriate undergraduate courses offered in the program. All candidates must meet the minimum [admission requirements for the Faculty of Graduate Studies](#).

### **Academic Regulations**

#### ***Program Requirements***

The graduate program consists of not less than 12 credit hours (or the equivalent) and the graduate seminar and a thesis is selected upon the advice of the thesis supervisor. The graduate student's program is submitted by the Food Science Program for review by Engineering Graduate Studies and Research Office.

#### ***Examination Requirement***

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses with a grade of at least B-. Any approved undergraduate course taken by a Master's candidate must be passed with a grade of at least B-. Graduate students are allowed to repeat only one course during their program. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

As well, all Master's degree candidates must pass an oral examination of their thesis or project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### ***Time Requirement***

A candidate for a Master of Science in Food Science degree will be required to spend at least 12 months' full-time work on course work and the thesis. A student is required to register each session to maintain eligibility to continue his/her program of studies. See Faculty of Graduate Studies Regulations for policies regarding the maximum length of time for degree completion and extensions.

#### ***Dates:***

Deadlines for applications for MEng:

September:

International Students: April 1st

Canadian Students: June 30th

January:  
International Students: August 31st  
Canadian Students: October 31st

## Co-op Master's Degrees

The Faculty of Engineering offers MASc (Co-op), MSc (Co-op) and MEng (Co-op) degrees. Participation in the co-op program requires a co-op research project suitable for a master's thesis (for co-op MASc and MSc degrees) or a master's project (for co-op MEng degree), and the student's acceptance by a faculty member in the Faculty of Engineering as well as a suitable sponsoring organization. The faculty member who will supervise the graduate student will determine the suitability of a project for master's level research.

The academic requirements for co-op master's degrees in Engineering are identical to those for regular (e.g., non-co-op) degrees with the addition of a minimum of eight months, or up to 12 months, of co-op work term(s). During the work terms, the graduate student will work on a research project that will form the basis of his/her master's thesis/project. The graduate student will conduct all or part of the research work as part of his/her co-op work at the employer's site. Also, all co-op graduate students should complete the "Co-op Workshop" offered by the Technical Co-operative Education Office before going on a work term.

Academic/Work term schedules shall be designed by the Supervising Committee of the graduate student taking into consideration the requirements of the research project as well as the needs of the student and the employer. In developing the schedules, the Supervising Committees shall adhere to the following guidelines:

1. The last term before completion of the degree requirements shall be an academic term.
2. The first co-op work term in the MASc and MSc programs will normally be taken after completing at least nine credit hours.
3. The first co-op work term in the MEng program will normally be taken after completing at least 12 credit hours.
4. Provided that conditions 1-3 above are satisfied, co-op work terms may be:
  - Alternate semesters
  - Summers only
  - One, two or three consecutive semesters
  - Parallel (part-time) with study
  - Other combinations

The normal upper time limits for the completion of co-op master's degrees will be the same as those for non-co-op degrees, e.g., four years for full-time and five years for part-time studies. The Supervisory Committee of co-op master's students will normally include the student's industrial supervisor as a member, or if appropriate (based on Faculty of Graduate Studies and Faculty of Engineering regulations), as a thesis/project co-supervisor. This arrangement will be agreed upon by the academic supervisor and the company before the student begins the program.

## Doctor of Philosophy (PhD)

### Admission Requirements and Procedures

A candidate to be considered for entrance into the PhD program must meet the admission requirements of the Faculty of Graduate Studies and must have:

- A research Master's Degree in engineering from Dalhousie University or any other recognized university, or a Master of Science Degree or its equivalent from a recognized university, acceptable to the Faculty of Engineering (in which case, a candidate may be required to take extra subjects to provide a suitable engineering background); or,
- Acceptance for registration as a candidate for a research Master's degree at this University.

A candidate registered for a Master's Degree may be transferred to a Doctoral Degree on the recommendation of his/her department, according to the Regulations of the Faculty of Engineering. The recommendation will be reviewed by the Faculty of Engineering Departmental Graduate Coordinator.

An application for admission to the graduate program leading to the degree of Doctor of Philosophy should have a superior academic record and previous training or experience which indicates that the candidate should be able to do independent research.

Doctoral candidates are not admitted without appropriate funding to support the student and the program of research.

## **Health Insurance Requirement**

Information pertaining to health insurance requirements is given in the [Fees section](#).

## **Academic Regulations**

All doctoral programs are developed under the regulations and procedures of the Faculty of Graduate Studies (see [Faculty of Graduate Studies Regulations](#)) and each program must be approved by the Faculty of Engineering and the Faculty of Graduate Studies.

### ***Course Requirements***

Doctoral programs in Engineering normally require a minimum of 12 credit hours, the graduate seminar, plus a thesis. No undergraduate courses are allowed for credit in a Doctoral Degree program.

### ***Thesis Subject Matter and Supervision***

The thesis shall consist of an original investigation or design carried out under the immediate supervision of a member of the Faculty of Engineering who is also a member of the Faculty of Graduate Studies.

### ***Admission from Master's Degree***

Based on starting from a Master of Applied Science Degree, a candidate must complete not less than 12 credit hours and the graduate seminar. These courses will normally be selected in consultation with the research supervisor and supervisory committee and must be approved by the Faculty of Engineering and the Faculty of Graduate Studies.

### ***Thesis Requirement***

A candidate will be required, as a major part of the program, to submit a satisfactory thesis embodying the results of original scholarship and independent research. See [Faculty of Graduate Studies Regulations](#) for information pertaining to doctoral theses.

### ***Examination Requirements***

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

A PhD degree candidate must pass all graduate level courses with a grade of at least B. Graduate students are allowed to repeat only one course during their program. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

PhD candidates are also required to pass comprehensive examinations which normally take place within the fourth study term. Students who receive a "fail" on the comprehensive examination will be asked to withdraw. Students who receive a marginal failure may be permitted to rewrite once. See Procedures and Guidelines, Section 5, below.

As well, all PhD degree candidates must pass an oral examination of his/her thesis project after it has been submitted in satisfactory form, and in accordance with the [Faculty of Graduate Studies Regulations](#).

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### ***Time and Residence Requirements***

A candidate for the PhD degree must spend the equivalent of three calendar years of full-time work on lectures and the thesis. However, credit for one calendar year may be granted for a Master's degree or its equivalent. A student is required to register each session to maintain eligibility to continue his/her program of studies. A PhD candidate shall spend at least two years in full time attendance of his/her research work at the University. See [Faculty of Graduate Studies Regulations](#) for policies regarding the maximum length of time for degree completion and extensions.

### ***Procedures and Guidelines***

1. The Department must ensure that supervisors are normally assigned to students prior to their registration. If the supervisor is not a full-time member of the Department, a co-supervisor will be appointed from the Department. The Department is to submit the name of the supervisor to the Faculty of Graduate Studies and the name will be officially recorded in the student's file.
2. Granting of credits to a student's program of studies for courses taken prior to commencement of the program requires the recommendation of the Department and approval of the Faculty of Engineering Graduate Studies Committee. A request for this transfer of credits must be made to the Department before the student's first registration or in the first term.
3. The supervisor is to appoint a Supervisory committee, within four months of the first registration, to be responsible for the Candidate's program and thesis preparation. The membership of the Supervisory Committee is to be conveyed for approval to the Engineering Graduate Studies Coordinator and recorded in the student's file. The Supervisory Committee will normally consist of the thesis supervisor, at least one other member from the department and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee. The Supervisory Committee is encouraged to submit progress reports once every six months to the Department's Graduate Co-ordinator.
4. The Supervisory Committee is required to submit a title for the student's thesis report, on the prescribed form, to the Engineering Graduate Studies Coordinator at least seven months prior to the formal submission of the thesis. On approval by Graduate Studies, the title will be recorded in the student's file and forwarded to the Faculty of Graduate Studies.
5. The Supervisory Committee shall be responsible for conducting the comprehensive examinations. The purpose of these examinations are to ensure that the student has a thorough understanding of the fundamentals in the student's area of study and that the student has attained knowledge to an adequate level in the discipline. The comprehensive examination consists of at least two written examination papers and an oral examination conducted to meet the above objective. The written papers are to be set and assessed by examiners recommended by the Supervisory committee. The comprehensive examination shall normally be completed within the fourth session of study from first registration. A student shall be given at least three months' notice of the examination. The topics and results of the examination will be conveyed to the Engineering Graduate Studies Coordinator on the prescribed form and will indicate "pass", "fail", or "re-examination". Recommendation of the examining committee to re-examine shall only be permitted if the failure was marginal. Students receiving a recommendation of "fail" shall be required to withdraw from the program by the Registrar's office. Re-examination of marginal students must be carried out within six months of the initial examination. Students requiring re-examination shall not necessarily be required to rewrite both written examinations. Students given the opportunity to rewrite shall only be permitted to rewrite once.
6. An Examining Committee is appointed in accordance with Faculty of Graduate Studies procedures prior to the formal submission of the thesis report. The Examining Committee normally consists of the Supervisory Committee and an external examiner. At least two members of the Examining Committee must be from the candidate's Department. The composition of the committee is to be recorded in the student's file. The names of three external examiners will be recommended to the Faculty of Graduate Studies. The External Examiner will be approached and appointed by the Faculty of Graduate Studies according to Faculty procedures.
7. A copy of the thesis must be submitted to the Faculty of Graduate Studies at least five weeks prior to the date of the oral defence. The copy will be sent to the External Examiner. The copy must be accompanied by the appropriate form. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:
  - i) Course work completed;
  - ii) Thesis title approved;
  - iii) The graduate seminar requirement completed;
  - iv) Examining Committee established;
  - v) Comprehensive examination passed;
  - vi) A written report has been received by the Faculty of Graduate Studies from the external examiner.
1. The student shall be advised by the departmental office of the approval of programs, the results of comprehensive examinations, and the approvals of the thesis title and committees.
2. The thesis is to be prepared to conform with the standards of the manual for the Preparation of Graduate Theses, available online at the Faculty of Graduate Studies.
3. The Associate Dean of Graduate Studies shall be the Chair of the Examination or shall appoint someone from the Faculty's Panel of PhD Chairs. The oral defence and examination shall be carried out according to Faculty of Graduate Studies procedures.

### ***Award of Degree***

A candidate will not be awarded the PhD degree unless they have satisfied all the foregoing requirements.

## **General Information**

### **Fees**

Information pertaining to fees and expenses is given in the [Fees section](#).

### **Financial Assistance**

Information pertaining to financial assistance and scholarships is given in the [Awards section](#).

### **Health Insurance Requirement**

Information pertaining to health insurance requirements is given in the [Fees section](#).

### **Application Forms**

Application forms may be obtained from the Registrar's Office, Dalhousie University, PO Box 15000, Halifax, NS B3H 4R2, or through the university's website.

Prospective students are encouraged to contact the Graduate Admissions Officer for program specific information.

### **English Language Proficiency Requirement**

Information pertaining to the English language proficiency requirements is given in the [Faculty of Graduate Studies Regulations](#) section.

### **Master's Degrees**

A student's program of study for the Master's degree may be either a research-intensive program (MAsc) or a coursework intensive program (MEng). A Master's degree taken according to either program represents an equivalent standard of academic achievement. Note that a research Master's degree is normally required to gain admission into the PhD program.

### **Course Requirement**

At least three-quarters (75%) of the total course requirement must be taken at the University. The graduate student's program submitted by the appropriate department and must be approved by the Engineering Graduate Studies Coordinator. Course requirements are given under the program requirements of the specific degrees.

### **Thesis/Project Requirement**

A master's candidate will be required to submit a thesis/project satisfactory to the Faculties of Graduate Studies and Engineering and to make an oral presentation of the work. Doctoral candidates must complete a thesis and oral defence in accordance with Faculty of Graduate Studies procedures but are also required to meet Faculty of Engineering requirements.

### **Leave of Absence**

Students may formally apply for a leave of absence in accordance with [Faculty of Graduate Studies Regulations](#).

### **Admissions Criteria**

All candidates must meet the admissions requirements of the Faculty of Graduate Studies, and any specific admissions requirements as listed under each program.

## **Procedures and Guidelines for Master's Theses and Projects**

1. The Department is to ensure that supervisors are assigned to students as a prerequisite to admission. The Department must submit the name of the supervisor to the Engineering Graduate Studies Coordinator and the name will be officially recorded in the student's permanent file. If the supervisor is not a full-time member of the Department a co-supervisor will be appointed from the Department.

2. Granting of credits to a student's program of studies for courses taken prior to commencement of the program requires the recommendation of the Department and approval of the Faculty of Engineering normally in advance of registration. Note that some courses from local universities have been given "blanket" approval. Students should contact their departmental Graduate Coordinator for details.
3. The Department is to appoint a Supervisory Committee, within four months of the first registration, to be responsible for the Candidate's program and thesis/project preparation. The membership of the Supervisory Committee is to be conveyed to Engineering Graduate Studies Coordinator for approval and recorded in the student's permanent file. The Supervisory Committee will normally consist of the thesis/project supervisor, at least one other member of the department, and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.
4. The Supervisory Committee is required to submit a title for the student's thesis/project report, on the prescribed form, to Engineering Graduate Studies Coordinator at least four months prior to the formal submission of the thesis/project. On approval by the Engineering Graduate Studies Coordinator, the title will be recorded in the student's permanent file.
5. A clean copy of the thesis/project report accompanied by the form "Appointment in an Oral Examination" must be submitted to the departmental Office at least 12 working days prior to the date of the oral defence. The department will co-ordinate the scheduling of the presentation and examination. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:
  - Course work completed;
  - Seminar requirement and the graduate seminar completed;
  - Supervisory committee approved;
  - Thesis/project title approved; and
  - Moderator appointed.
1. The thesis/project report is to be prepared to conform with the standards of the Faculty of Graduate Studies or on the Faculty's Website on the Internet.
2. The Department Head or his/her appointee (someone not involved as a member of the Supervisory Committee) shall be a moderator of the oral examination.
3. The student shall be advised by the Engineering Graduate Studies Coordinator of the approval of programs and the approval of thesis titles.
4. The student is required to deliver seminars according to the regulations of the Faculty of Engineering. The seminar requirement involves attending, and participating in, all Graduate Seminars held at the student's department/ program throughout the duration of the student's residency period, as well as making at least one seminar presentation. The department/program graduate coordinator is responsible from organizing the Graduate Seminars, and for deciding whether a student has met the requirement.

## Areas of Study

Graduate programs are offered in Biological Engineering, Biomedical Engineering, Chemical Engineering, Civil Engineering, Electrical and Computer Engineering, Engineering Mathematics, Environmental Engineering, Food Science, Industrial Engineering, Mechanical Engineering, Materials Engineering, Mineral Resource Engineering, and Internetworking.

## Biological Engineering

Programs offered are MEng, MASC, and PhD: Specific areas of Biological Engineering in which the Department has concentrated include biological waste management (disposal and reuse), bio robotics, agricultural engineering (drainage, soil erosion, farm machinery), aquacultural engineering, food processing engineering, renewable energy (solar and biomass), energy conservation in greenhouses, and pollution control (non-point source, wetlands). Please refer to the [departmental entry](#), for additional information.

## Biomedical Engineering

The School of Biomedical Engineering is a partnership between the Faculties of Engineering, Medicine and Dentistry. The programs offered are the MASC and PhD. Research interests include biomaterials, bioelectricity and biomagnetism, medical imaging, physiological modelling, and rehabilitation. Please refer to the [departmental entry](#), for additional information.

## Chemical Engineering

The graduate program focuses on chemical process principles applied to environmental and energy resources. Topics include environmental considerations of combustion technology, fuel preparation, control of explosion hazards, development of innovative process control algorithms and treatment of industrial waste. Fundamental studies are done in mass transfer and rheology, Membrane Separation, Flotation, Coagulation, Gas-liquid System, Emulsification. Programs offered are MEng, MASC, and PhD. Please refer to the [departmental entry](#), for additional information.

## Civil Engineering

Programs offered are MEng, MASC, and PhD: Geotechnical Foundation Engineering, Structural Plastics, Wind Power Engineering, Timber Structures, Wood Engineering, Concrete Research, Geometric Design of Highways, Traffic Systems, Steel Structures, Structural Analysis, Wastewater Treatment, Water Pollution Control, Highway Materials, Environmental Engineering Hydraulics, Water Resources Engineering. Please refer to the [departmental entry](#), for additional information.

## Electrical and Computer Engineering

Programs offered are MEng, MASC, and PhD: Control Systems, Robotics, Instrumentation; Electric Power Systems; Electrical Machines, High-Voltage Engineering, Photovoltaic Solar Power Systems, Active and Switched-Capacitor Networks; Digital Communication Systems; Cardiovascular Dynamics, Medical Instrumentation, Medical Applications of Computers, Bioelectromagnetic; Ultrasonic Telemetry, Design of Integrated Circuits, Microprocessor-Based Systems. Please refer to the [departmental entry](#), for additional information.

## Engineering Mathematics

This is an interdisciplinary program between Engineering and Applied Mathematics, enabling mathematics and physics majors to carry out theoretical and numerical analysis of applied problems and engineering students to prepare mathematical models of engineering problems. Programs offered are MSc and PhD. Please refer to the [departmental entry](#), for additional information.

## Environmental Engineering

Interdisciplinary graduate studies and research are offered on a wide range of topics in Environmental Engineering: energy and environment, engineered wetlands and bioremediation, indoor air quality, soil erosion, water quality, waste management and remediation, pollution control and environmental assessment. This is an interdisciplinary program of the Faculty of Engineering leading the MEng and MASC degrees in Environmental Engineering and the PhD degree in Engineering. Contact the Faculty of Graduate Studies Office for more information.

## Food Science

Research studies are offered on a wide range of topics in food processing, food microbiology, food chemistry, food rheology, microstructure, food engineering and fats and oils. Special emphasis is placed on seafood preservation, storage, and handling. Programs offered are MSc and PhD. Please refer to the [departmental entry](#), for additional information.

## Industrial Engineering

Key areas of research interest in the Department are operations research modelling, mathematical optimization, production planning and control, modelling of economic systems, queueing theory, vehicle and crew scheduling, industrial ergonomics, and workplace design. Applications are primarily selected in the resource base industries of forestry, fishing, and mining as well as the smaller sized local business. Programs offered are MEng, MASC, and PhD. Please refer to the [departmental entry](#), for additional information.

## Internetworking

The full fee Internetworking program has been designed in consultation with industry leaders to ensure that the graduates will have the core knowledge base for a rewarding career in the internetworking industry. There are ten required courses. Each course has a significant hands-on component in a modern internetworking laboratory. This is offered as a MEng program. Please refer to the [departmental entry](#), for additional information.

## Materials Engineering

Graduate studies at the Master's and PhD levels are offered; students should apply for these programs in the usual manner. Graduate studies at the Master's level are also offered as a co-operative, combined BEng. - MASC program which is described in detail in the Undergraduate section of this Calendar. Present areas of study are in the chemical, physical and mechanical processing of metals, ceramics and materials, corrosion in marine and high temperature environments, mineral beneficiation, high temperature electrochemical processing and growth of opto-electronic materials. Programs offered are MEng, MASC, and PhD. Please refer to the [departmental entry](#), for additional information.

## Mechanical Engineering

Fluid Power Systems, Energy Conversion Systems, Fluidized Bed Combustion, Computational Fluid Dynamics, Vibration, CAD/CAM, CAE, Biomedical Engineering, Finite-Element Techniques, Machine and Rotor Dynamics, Machine Design, Robotics, Solar Energy Systems, Ship and Marine Hydrodynamics, Composites, Energy Management, Turbulence Modeling, Two-Phase Flow. Programs offered are MEng, MASC, and PhD. Please refer to the [departmental entry](#), for additional information.

## Minerals Resource Engineering

Programs offered are MEng, MASC, and PhD with research opportunities in the areas of geostatic, mine mechanization, coal mine support, computer applications in mining, mine waste management, ocean mining, mineral beneficiation, solid/liquid separation, mineral economics, reservoir engineering, horizontal drilling, petroleum drilling fluids, and oil shale studies. Please refer to the [departmental entry](#), for additional information.

## Petroleum Engineering

Note: Admission to the MEng program in Petroleum is suspended. The program will continue to be delivered to any current students until all students have graduated, or the time allowed for program completion has elapsed, or all students have left the program.

Degree programs available include MEng, MASC and PhD associated with various engineering disciplines.

See [Process Engineering and Applied Science](#) (PEAS) and [Civil and Resource Engineering](#) for additional information.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### IDIS 6003 Materials Science

CREDIT HOURS: 3

Advanced topics on the physical and thermal properties of representative materials (metals, ceramics, composites, and plastics) are discussed in relation to thermodynamics and kinetics of phase transformations. The electrical properties of metals, semiconductors and insulators are reviewed in terms of the modification of these properties by chemical substitution. The relation of mechanical properties of the materials to the proper selection process for materials for a specific application is discussed. Case studies are used to illustrate integration of the above topics.

### IDIS 6004 Solid State Engineering

CREDIT HOURS: 3

An interdisciplinary course covering: selected topics in crystallography, including space groups and space lattices, bonding forces and the mechanism of



crystal growth; imperfections in solids-vacancies, interstitial, dislocations and the properties of defects; the preparation of materials-metals, semiconductors, ceramics, ferrites, polymers, vapour deposition technique, growth of single crystals from solution, metal and vapour, the mechanical, electrical and magnetic properties of materials; the design of electronic devices, e.g., microwave devices such as ferrite isolators and parametric amplifiers and semiconductor devices, which utilize the special properties of materials prepared by the student. The experimental work will involve the synthesis of ferrites, semiconductors, etc., their examination by X-ray powder photographs and measurements of their properties such as Hall effect, etc.

### **IDIS 6006 Optimization in Engineering**

CREDIT HOURS: 3

Nature and systems considered in engineering and physics have an abundance of examples where an optimum system status is sought. The course aims to provide the students with advanced theory of optimization and topics that arise in applications of the optimization techniques. The challenge of this course is to increase the utilization of the optimization methods by development and use of appropriate algorithms derived for specific problems in engineering and physics. They include those arising in VLSI design, computer engineering, chemical reactor control, in spin glasses as well as in networking, particularly in networks with frequently changing topology. State-of-the-art of the advanced optimization techniques is presented. Geometric interpretations, time-space decompositions and large- and small-scale considerations are stressed wherever possible.

PREREQUISITES: Permission from instructor

CROSSLISTED: ECED 6650.03

FORMATS: Lecture

### **IDIS 6010 Industrial Waste Management**

CREDIT HOURS: 3

Industrial processes that generate solid, liquid and gaseous wastes will be reviewed and methods of control will be discussed. Waste management systems that include recycling, recovery and reuse will be considered. Examples will be drawn from Nova Scotia industry and students will be required to undertake case studies of selected industries.

### **IDIS 6011 Water Resources Management and Planning**

CREDIT HOURS: 3

This course will cover planning and management considerations that are important in water-related engineering decisions. Topics to be considered are: constitutional and legal frameworks for water management in Canada and Nova Scotia; conceptional approaches to water management; water use and management issues; nature and purpose of water management; water management frameworks and functions; and institutional arrangements for water management.

### **IDIS 6013 Environmental Health Engineering**

CREDIT HOURS: 3

Radiological health, air pollution control, solid waste treatment, vector control, milk and food sanitation, industrial hygiene.

### **IDIS 6030 Energy Resources and Utilization**

CREDIT HOURS: 3

This course surveys world energy resources and examines the technical feasibility for utilization. The course will attempt to evaluate elements for the Canadian energy policy.

### **IDIS 6031 Energy and the Environment**

CREDIT HOURS: 3

This course examines the physical nature of energy resources and the impact of their development on environmental quality. Technological options to alleviate impact will be examined.

### **IDIS 6032 Limnology**

CREDIT HOURS: 3

A review of the basic principles of the chemical, physical and biological nature of surface waters will be followed by an examination of advanced topics related to water management.

## **IDIS 6110 Open Channel Hydraulics**

CREDIT HOURS: 3

This advanced course will begin with a review of basic concepts of fluid flow. The course will deal with the energy principle and the momentum principle in respect to open channel flow; flow resistance in uniform and nonuniform flow computations; channel controls; channel transitions; and sediment transport.

# **Engineering Mathematics**

Location:

5217 Morris Street

PO BOX

Halifax NS

B3J 1B6

Phone Number: (902) 494 6085

Fax Number: (902) 423 1801

Email Address: [claire.chisholm@dal.ca](mailto:claire.chisholm@dal.ca)

Website: [www.dal.ca/faculty/engineering/math-internetworking.html](http://www.dal.ca/faculty/engineering/math-internetworking.html)

## **Introduction**

The Engineering Mathematics Program has a strong record of applying advanced mathematical techniques to a wide variety of practical engineering problems ranging from geotechnical engineering, structural analysis and hydrodynamics to neural and telecommunication network analysis, signal processing and ocean population dynamics.

## **Staff**

### **Department Head**

**Fenton, G.**, BEng, MEng (Carleton), MA, PhD (Princeton), PEng.

### **Professors**

**Fenton, G.**, BEng, MEng (Carleton), MA, PhD (Princeton), PEng. Variance reduction techniques, geotechnical design, risk assessment of geotechnical systems, earth retaining structures, climate, carbon capture and storage

**Iakovlev, S.**, MEng, PhD (St. Petersburg Marine Technical University), PEng. Mathematical modeling of non-stationary fluid-structure interaction

**Kember, G. C.**, BSc, MSc, PhD (UWO). Networked neural control, industrial control over IP, asymptotic methods, biological signal processing

**Robertson, W.**, BSc (Eng Hons), MSc (Aberdeen), PhD (TUNS), PEng. Network communications, quality of service, wireless networks

### **Associate Professors**

**Gentleman, W. C.**, BEng (hons.) (McGill), PhD (Dartmouth College). Zooplankton grazing behavior, environmental variability, scallop larvae simulation

### **Adjunct (FGS)**

**Ajjijola, O.**, MD (Duke), PhD (UCLA)

**Aslam, N.**, BSc (University of Engineering and Technology, Lahore), MEng (Dalhousie), PhD (Dalhousie)

**Comeau, F.**, Diplome de Genie General (University of Moncton), BEng (TUNS), MSc (TUNS), PhD (Dalhousie)

**Olivera, R.**, BEng (Western Institute of Technology in Guadalajara), MSc (La Universidad de Guadalajara), PhD (Waterloo)

**Perrie, W.**, BSc (University of Toronto), PhD (MIT)

**Sivakumar, S.**, BEng (Bangalore), MSc (Dalhousie), PhD (Dalhousie)

# **General Information**

### **Admissions Criteria**

All candidates must meet the admissions requirements of the Faculty of Graduate Studies, and any specific admissions requirements as listed under each program.

**Application Forms**

Application forms may be obtained from the Registrar's Office, Dalhousie University, PO Box 15000, Halifax, NS B3H 4R2, or through the university's website.

Prospective students are encouraged to contact the Graduate Admissions Officer for the program-specific information.

**English Language Proficiency Requirement**

Information pertaining to the English language proficiency requirements is given in the Faculty of Graduate Studies Regulations, Section 3.4.

**Fees**

Information pertaining to fees and expenses can be found online in the Admission section of the Dalhousie Website.

**Financial Assistance**

Information pertaining to financial assistance and scholarships can be found online in the Funding Opportunity section of the Faculty of Graduate Studies Website.

**Health Insurance Requirement**

Information pertaining to health insurance requirements is given in the Resources and Services section of the Dalhousie Graduate Calendar.

**Graduate Student Program**

The graduate student's program, including supervisory committee composition, will be entered in the Graduate Student Information System (GSIS) by the department and approved by the supervisor, the graduate coordinator and FGS. The details of the program should be submitted in the first month after initial registration. The composition of the supervisory committee should be entered by the end of the second term.

**Course Requirement**

At least three-quarters (75%) of the total course requirement for each graduate program must be taken at Dalhousie University.

**Leave of Absence**

Students may formally apply for a leave of absence in accordance with the Faculty of Graduate Studies Regulations, Section 5.8.

## Master's Programs

### Master of Science (MSc)

**Admission Requirements**

A candidate to be considered for the Master of Science program must have obtained, with a high scholastic standing, an undergraduate degree in engineering or science, or an equivalent, from a recognized university.

Candidates must also be recommended for admission by a faculty member in order for their application to proceed. It is noted that a recommendation for admission is not a formal acceptance.

Candidates for the Master of Science program are not admitted without appropriate funding sufficient to support the student and the intended program of research.

**Academic Regulations****Program Requirements**

A MSc graduate program consists of not less than 12 credit hours and a thesis. Not more than two senior level undergraduate courses may be taken as part of this credit hour requirement.

**Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the thesis/project supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses, and any approved undergraduate course, with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

As well, all Master's degree candidates must pass an oral examination of their thesis or project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### **Time Requirement**

The minimum time requirement for completing a Master's program is twelve months. All students are required to register each term to maintain eligibility to continue a program of studies. Students are required to be on campus for at least two terms in the first year of their program. See Faculty of Graduate Studies Regulations, Section 7, for policies regarding the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for Master's Theses and Projects**

1. The thesis/project report is to be prepared to conform with the standards of the Faculty of Graduate Studies.
2. To initiate the thesis/project defence, the form "Appointment for an Oral Examination & Thesis Submission Form – Master's Programs" must be submitted to the departmental Office at least 10 business days prior to the date of the oral defence. The department will coordinate the scheduling of the presentation and examination and assign a chair/moderator. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:
  - i) Course work completed;
  - ii) Seminar completed;
  - iii) Supervisory committee approved.

### **Co-op MSc Degree**

The Program offers an MSc (Co-op) degree. Participation in the co-op program requires a co-op research project suitable for a master's thesis, and the student's acceptance by a faculty member in the Faculty of Engineering, as well as a suitable sponsoring organization. The faculty member who will supervise the graduate student will determine the suitability of a project for master's level research.

The academic requirements for co-op master's degrees in Engineering are identical to those for regular (e.g., non-co-op) degrees with the addition of a minimum of eight months, or up to 12 months, of co-op work term(s). During the work terms, the graduate student will work on a research project that will form the basis of their master's thesis. The graduate student will conduct all or part of their research as part of their co-op work at the employer's site. Also, all co-op graduate students should complete the "Co-op Orientation" course offered by the Science, Information Technology, Engineering Cooperative Education Office before going on a work term.

Academic/Work term schedules shall be designed by the Supervising Committee of the graduate student taking into consideration the requirements of the research project as well as the needs of the student and the employer. In developing the schedules, the Supervising Committees shall adhere to the following guidelines:

1. The last term before completion of the degree requirements shall be an academic term.
2. The first co-op work term will normally be taken after completing at least nine credit hours.
3. Provided that conditions 1 and 2 above are satisfied, co-op work terms may be arranged in any combination that suits the student's research plan.

The normal upper time limits for the completion of co-op master's degrees will be the same as those for non-co-op degrees, e.g., four years for full-time and five years for part-time studies. The Supervisory Committee of co-op master's students will normally include the student's industrial supervisor as a member, or if appropriate (based on Faculty of Graduate Studies and Faculty of Engineering regulations), as a thesis co-supervisor. This arrangement will be agreed upon by the academic supervisor and the company before the student begins the program.

## **PhD Program**

### **Doctor of Philosophy (PhD)**

#### **Admission Requirements and Procedures**

A candidate to be considered for entrance into the PhD program must meet the admission requirements of the Faculty of Graduate Studies and must have a research Master's degree in engineering from Dalhousie University or other recognized university, or a Master of Science degree or its equivalent from a recognized university and acceptable to the Faculty of Engineering.

A candidate for admission to the graduate program leading to the degree of Doctor of Philosophy should have a superior academic record and previous training or experience which indicates that the candidate should be able to carry out independent research.

Candidates must also be recommended for admission by a faculty member in order for their application to proceed. It is noted that a recommendation for admission is not a formal acceptance.

Doctoral candidates are not admitted without appropriate funding sufficient to support the student and the intended program of research.

#### **Admission from Master's Degree**

A candidate registered in a MASc Degree in the department may be transferred to a PhD Degree on the recommendation of their supervisory committee, according to the Regulations of the Faculty of Engineering. The recommendation will be reviewed by the Faculty of Engineering Graduate Studies Committee (GSC) and transmitted to the Faculty of Graduate Studies.

#### **Academic Regulations**

All doctoral programs are developed under the regulations and procedures of the Faculty of Graduate Studies (see Faculty of Graduate Studies Regulations) and each program must be approved by the Faculty of Engineering and the Faculty of Graduate Studies.

#### **Program Requirements**

A PhD graduate program consists of a minimum of 12 credit hours, a comprehensive exam, and a thesis. No undergraduate courses are allowed for credit in a PhD program.

Granting of credits to a student's program of studies for courses taken prior to commencement of the program requires the recommendation of the department and approval of the Faculty of Engineering Graduate Studies Committee. A request for this transfer of credits must be made to the department either before the student's first registration in the program or in their first term in the program.

#### **Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the thesis/project supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

#### **Thesis Subject Matter and Supervision**

The thesis shall consist of an original investigation or design carried out under the immediate supervision of a member of the Faculty of Engineering who is also a member of the Faculty of Graduate Studies.

#### **Thesis Requirement**

A candidate will be required, as a major part of the program, to submit a satisfactory thesis embodying the results of original scholarship and independent research. See Faculty of Graduate Studies Regulations for information pertaining to doctoral theses.

### **Examination Requirements**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

A PhD degree candidate must pass all graduate level courses with a grade of at least B- and cannot carry a course failure. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

PhD candidates are also required to pass a comprehensive examination which normally take place within the fourth study term.

As well, all PhD degree candidates must pass an oral examination of their thesis project after it has been submitted in satisfactory form, and in accordance with the Faculty of Graduate Studies Regulations.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### **Comprehensive Examination**

The Supervisory Committee shall be responsible for conducting the comprehensive examinations.

The purpose of the comprehensive examination is to ensure that the candidate has a thorough understanding of the chosen field of study as a whole, has attained knowledge to an adequate level in the discipline and evaluate their suitability to begin Ph.D. level thesis research.

The comprehensive examination consists of at least two written examinations and an oral examination conducted to meet the above objective. The comprehensive examination shall normally be started within the fourth session of study from first registration. A student shall be given at least three months' notice of the examination. The topics and results of the examination will be conveyed to PhD Candidate Home Department's Graduate Coordinator on the prescribed form and will indicate "pass", "fail", or "re-examination". The results to be added to the student's transcript.

Recommendation of the examining committee to re-examine shall only be permitted if the failure was marginal. Re-examination of marginal students must be carried out within six months of the initial examination. Students requiring re-examination shall not necessarily be required to rewrite both written examinations. Students given the opportunity to rewrite shall only be permitted to rewrite once.

Students receiving a recommendation of "fail" will be academically dismissed from the program (see FGS regulations about dismissal).

### **Time and Residence Requirements**

A student is required to register each term to maintain eligibility to continue their program of studies. See Faculty of Graduate Studies Regulations for policies regarding residency requirements and the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for PhD These Defences**

An Examining Committee is appointed in accordance with Faculty of Graduate Studies procedures prior to the formal submission of the thesis. The Examining Committee consists of the Supervisory Committee and an external examiner recommended to FGS by the Supervisory Committee. The External Examiner will be approached and appointed by the Faculty of Graduate Studies according to the Faculty's procedures.

A copy of the thesis must be submitted to the Faculty of Graduate Studies at least six weeks prior to the date of the oral defence. The copy will be sent to the External Examiner. The copy must be accompanied by the appropriate form. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:

- i) Course work completed;
- ii) The graduate seminar requirement completed;
- iii) Comprehensive examination passed;
- iv) Examining Committee established;
- v) A written report has been received by the Faculty of Graduate Studies from the external examiner.

# Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **ENGM 6000 Directed Studies in Applied Mathematics**

CREDIT HOURS: 3

This course is offered to graduate students enrolled in Applied Mathematics who wish to gain knowledge in a specific area for which no appropriate graduate level courses are offered. Each student taking this course will be assigned a suitable course advisor familiar with the specific area of interest. The student will be required to present the work of one term (not less than 90 hours in the form of directed research, and individual study) in an organized publication format.

### **ENGM 6610 Wavelets and Filter Banks**

CREDIT HOURS: 3

This course explains wavelets and filter banks using both the language of filters and the language of linear algebra. The course concentrates on the underpinnings of this relatively young (1980's) subject which has now stabilized. Applications to the areas of image and video compression, speech, audio, and ECG compression and denoising are presented.

### **ENGM 6611 Functions of Complex Variables**

CREDIT HOURS: 3

This course is concerned with the theory of functions of complex variables and its applications in various branches of science and engineering. Topics included are: analytic functions, Cauchy-Riemann conditions, elementary functions, simple mappings, complex integrations, Taylor's and Laurent's expansions; the calculus of residues and its applications in computing integrals; the use of Bromwich contour and Nyquist stability criterion; the application of conformal mappings i.e. Schwartz-Christoffel transformation to the solution of fluid-flow, heat transfer and electrical potential problems; and the integral form of Poisson's equation.

### **ENGM 6612 Methods of Applied Mathematics I**

CREDIT HOURS: 3

Classical boundary-value problems of mathematical physics. Classical analytical solutions of boundary-value problems. Special functions. Numerical aspects of the classical analytical solutions. Integral transforms and their application to classical problems of mathematical physics.

FORMATS: Lecture

### **ENGM 6613 Methods of Applied Mathematics II**

CREDIT HOURS: 3

Linear partial differential equations. Derivation of classical equations, classification and boundary condition, separation of variable technique, integral transform method of solving partial differential equations.

PREREQUISITES: ENGM 6612

### **ENGM 6621 Vibrations and Waves**

CREDIT HOURS: 3

Vibratory systems with several degrees of freedom. Approximate methods of calculating frequencies of natural vibrations. Solution of eigenvalue problems by matrix iteration. Vibration of elastic bodies. Wave equation. Applications of rods, plates, and shells. Plane waves and spherical waves in unbounded homogeneous elastic media.

Elements of harmonic wave phenomenon; reflection, resonance, relaxation, and reverberation. Wave propagation through fluid and solid layers.

### **ENGM 6657 Numerical Linear Algebra**

CREDIT HOURS: 3

The topics covered in this course include matrix and vector norms, condition number, singular value decomposition, LU decomposition, QR decomposition, Cholesky decomposition, error analysis and complexity of matrix algorithms, Toeplitz matrix algorithms, orthogonalization and least squares methods, the symmetric and unsymmetric eigenvalue problems, and iterative methods. The student is expected to code most of the algorithms on the computer.

PREREQUISITES: Ability to programme in C or Fortran.

### **ENGM 6658 Numerical Solution of Differential Equations**

CREDIT HOURS: 3

This course begin with a study of solution techniques or ordinary differential equations. Then a review of the basic partial differential equations of engineering mathematics is undertaken. The finite difference method is used to discretize these equations and concepts of stability, consistency, and convergence in the solutions are introduced. The student is expected to write several computer programs.

PREREQUISITES: Ability to programme in C or Fortran.

### **ENGM 6659 Finite Element Solution of Linear Partial Differential Equations**

CREDIT HOURS: 3

This course covers aspects of the solution of linear static and dynamic partial differential equations through the use of finite element models derived from the Galerkin approximation. Emphasis is placed on the derivation of the approximate matrix equations from the strong form of the boundary value problem and on issues concerning the accuracy of the solution, on integration techniques, completeness, and element tests. Students are expected to code and validate an element appropriate to their specific research interests.

PREREQUISITES: Familiarity with partial differential equations and numerical linear algebra.

### **ENGM 6660 Finite Element Solution of Non-Linear Partial Differential Equations**

CREDIT HOURS: 3

This course covers aspects of the solution of non-linear partial differential equations through the use of finite element models. Emphasis is placed on the modeling of engineering materials. The course addresses such topics as common plasticity relationships, numerical implementation of various yield models, finite deformations, consistent linearization schemes, and theorems dealing with existence, uniqueness, and stability. Students are expected to implement a non-linear finite element algorithm on the computer.

PREREQUISITES: ENGM 6659.03 is recommended

### **ENGM 6671 Applied Regression Analysis**

CREDIT HOURS: 3

This course will emphasize practical rather than theoretical considerations and will make extensive use of computer packages. The topics to be covered include simple linear regression, analysis of residuals and remedial measures, transformation of data, multiple, polynomial and weighted regression, model selection techniques, joint confidence regions, use of indicator variables, analysis of covariance and an introduction to non-linear regression.

### **ENGM 6675 Risk Assessment and Management**

CREDIT HOURS: 3

This course introduces risk assessment and system reliability methodologies, from classical event trees to simulation. Examples of risk-based decision-making analyses will be covered, ranging from oil exploration to environmental site remediation. The student will carry out a risk assessment involving design decisions on a project of their own choosing.

### **ENGM 6680 Ecosystems Modeling of Marine and Freshwater Environments**

CREDIT HOURS: 3

Students develop and apply mathematical models of marine and freshwater ecosystems to study biological production, biogeochemical cycling etc. Lectures provide theoretical background for coupling nutrient and plankton dynamics, including parameterizing biological processes and physical effects. Computer sessions provide hands-on modelling experience. Students also critique literature and conduct an independent research project.

CROSSLISTED: OCEA 5680.03, ENGM 4680.03

FORMATS: Lecture | Discussion



## **ENGM 9000 Master's Thesis**

CREDIT HOURS: 0

## **ENGM 9530 PhD Thesis**

CREDIT HOURS: 0

# **English**

Location:

Marion McCain Arts and Social Sciences

6135 University Avenue

Room 1186

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-6924

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# **Introduction**

Applicants should designate the proposed thesis area at the time of application for admission. The Department will entertain research proposals at the MA level in most areas of British, Canadian, Postcolonial or American literature, and at the PhD level in many of these areas. Nonetheless, applicants for the PhD should take care to consult the Graduate Coordinator of the department concerning its strength, in both resources and faculty, in the field of study in which they propose to specialize.

# **Staff**

## **Dean**

**Harvey, F.**, BA, MA, PhD (McGill)

## **Chair**

**Haslam, J.**, BA, MA (McGill), PhD (Waterloo)

## **Undergraduate Advisor**

**Enns, A.**, BA (Univ of North Carolina), MA (Hollin Univ), MA, PhD (Univ of Iowa)

## **Professors Emeriti**

**Barker, W.**, AB (Dartmouth), MA, BEd, PhD (Toronto)

**Baxter, J. R.**, BA, BEd, MA, PhD (Alta)

**Diepeveen, L. P.**, BA (Calvin Col), MA, PhD (Ill), FRSC, George Munro Professor in Literature and Rhetoric in English

**Fraser, J.**, MA (Oxon), PhD (Minn), FRSC

**Huebert, R.**, BA (Saskatchewan), MA, PhD (Pitt)

**Stone, M. I.**, BA (Guelph), MA, MPhil (Waterloo), PhD (Toronto), McCulloch Chair in English

**Wainwright, J. A.**, BA (Toronto), MA, PhD (Dalhousie), McCullough Professor in English

## **Professors**

**Haslam, J.**, BA, MA (McGill), PhD (Waterloo)

**Luckyj, C.**, BA, MA, PhD (Toronto)

**Wright, J.**, BA, MA, PhD (Western), FRSC, George Munro Professor in Literature and Rhetoric in English

#### **Associate Professors**

**Bennett, E.**, BA, MA (Dalhousie), MA (Carleton), PhD (Dalhousie)

**Cawsey, K.**, BA (Wilfrid Laurier), MPhil (Oxford), PhD (Toronto)

**Enns, A.**, BA (Univ of North Carolina), MA (Hollin Univ), MA, PhD (Univ of Iowa)

**Evans, D.**, BA (Toronto), MA, PhD (Rutgers)

**Grant, S.**, BMus (Dalhousie), BJ (King's), MFA (UBC)

**Maitzen, R.**, BA (UBC), MA, PhD (Cornell)

**Ross, T.**, BA, MA (Carleton), PhD (Toronto)

**Wunker, E.**, BA (Univ of North Carolina), MA (McGill), PhD (Calgary)

#### **Assistant Professors**

**Brown, A.**, BA (York), MA (McGill), PhD (Yale)

**Brittan, A.**, BA, MA (Toronto), PhD (Pennsylvania)

**Gillis, B.**, BA (Loyola), MsS (Oxford)

**Jeffers, A.**, BA (Guelph), MA (McMaster), PhD (York)

**Jessup, H.**, BA (Victoria), MA (Concordia), PhD (Toronto)

**Robinson, M.**, BA (St. Mary's), MA, PhD (Toronto)

**Vautour, B.**, BA (Guelph), MA (UT/OISE), MA, PhD (Dalhousie)

#### **Senior Instructor**

**Choyce, L.**, BA (Rutgers), MA (Montclair), MA (CUNY)

## **Admission Requirements**

Candidates must at a minimum satisfy the general requirements for admission to the Faculty of Graduate Studies as spelled out in Section II in the [Faculty of Graduate Studies Regulations](#). Since this department usually accepts full-time graduate students only if it can fund them, standards are very high, currently an A- (3.70) or better average in the last two years. Both MA and PhD programs presuppose an acquaintance with English literature of different periods and nationalities. Applicants with other strengths but with limited historical coverage might still be accepted but might be required to remedy deficiencies with one or even two of their graduate courses.

Students are reminded that the pragmatic, departmental deadline for applications is much earlier than the official Faculty of Graduate Studies one of June 30. Students who wish their applications **to be competitive** should **submit them by January 15**. Those who wish to be considered as **candidates for Killam awards** must **submit complete applications by January 15**. We strongly recommend that applicants apply for external funding from the Social Sciences and Humanities Research Council of Canada (SSHRC). Please consult the departmental website for full, updated information, including deadline dates and details.

## **Master of Arts (MA)**

**Graduate Courses:** MA students complete six three-credit hour (ENGL 5000 or higher) courses.

**Language Requirement:** MA graduates must have demonstrated proficiency in one language other than English. Students can fulfill the second language requirement in several ways. The most common is attaining a grade of C or better in a university-level course or courses approved by the Graduate Coordinator. Another is passing an approved language examination (such as the placement exam offered by Dalhousie's French Department). Students who command strong proficiency in a second language may also appeal to the Graduate Committee for exemption from formal testing or course work.

**Professional Development:** MA students benefit from a number of mandatory and optional workshops offered over the course of the academic year. Beginning with principles and practices of effective teaching, professional development workshops also cover topics such as public speaking and paper presentation, career options and the job search, and writing grant proposals.

Developing skills in teaching, presenting, and professional collaboration, many MA students are also employed as Teaching Assistants, usually for first-year courses. Though TAs may take on a variety of tasks, most lead tutorials, grade, and comment on student essays, hold individual meetings with students, and sometimes lecture or lead class discussion.

## Thesis

The thesis is integral to Dalhousie's English MA, **and all MA students must complete one to graduate**. Students should discuss thesis topics with potential supervisors by the beginning of January and have an agreeable supervisor in place by the end of the month. Adjunct professors from other Departments and universities in the Halifax area may also be considered as co-supervisors. A 1000-word Thesis Prospectus outlining the project and including a brief review of current scholarship as well as a description of the approach must be approved by the supervisor and submitted for Graduate Committee approval by mid-February.

The thesis may take the form of a research thesis or scholarly edition thesis and must demonstrate some mastery in academic writing and advanced research. Documentation must follow the latest edition of *The MLA Handbook*, and the thesis must conform to the most recent [Faculty of Graduate Studies formatting requirements](#). Examples of past theses are available in the Department, and recent theses are available through [DalSpace](#). More information on thesis requirements and expectations can be found on the [program website](#).

ENGL 8000.00 Thesis Prospectus is mandatory for all MA students.

## Doctor of Philosophy (PhD)

For the minimum time required to complete this program, see [Section 2.3.2](#), in the [Faculty of Graduate Studies regulations](#).

In the first year, doctoral candidates usually take the equivalent of three full-year graduate seminars.

Candidates must take a qualifying examination, with written and oral portions, in the field (period and national literature) most germane to their intended thesis. The examination is to be taken no later than May of the second year in the program.

All graduate students in the Department are required to demonstrate some proficiency in at least one language other than English that is relevant to their studies.

Preparation and defence of a thesis are required.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

### *Graduate Courses*

Approximately 10 half-year courses or the equivalent are offered each year. Students should consult the [Departmental Website](#) about which seminars will be offered.

## Course Descriptions

### **ENGL 5000 Directed Reading**

CREDIT HOURS: 3

RESTRICTIONS: Students may only register for this class with the written permission of a Faculty member and the Graduate Coordinator.

**ENGL 5118 Reading the Canterbury Tales (All of Them)**

CREDIT HOURS: 3

This course will provide an opportunity to read Chaucer's *Canterbury Tales* closely in its entirety, with a view to establishing over-arching connections, themes, and concerns.

FORMATS: Seminar

**ENGL 5119 Chaucer - Dream Visions and Tales other than Canterbury**

CREDIT HOURS: 3

This course will cover Chaucer's non- *Canterbury Tales* writings, including *Troilus and Criseyde*, *The House of Fame*, *The Parliament of Fowls*, *The Legend of Good Women*, and *The Book of the Duchess*. We will consider Chaucer's sources and predecessors as well as imitations and expansions such as Henryson's *Testament of Cresseid*.

FORMATS: Seminar

**ENGL 5121 Guy Gavriel Kay and his medieval inspiration**

CREDIT HOURS: 3

This course will take an intertextual and trans-historical approach to the work of Canadian fantasy writer Guy Gavriel Kay.

FORMATS: Seminar

**ENGL 5135 England's Late-Medieval Alliterative Poetry**

CREDIT HOURS: 3

This seminar will survey such masterworks of the late-medieval period as *Pearl*, *Sir Gawain*, and *Piers Plowman*, as well as diverse lyrics and short poems, major romance-narratives and cycle-plays. Analysis of the poems' verbal resources, stylistic techniques and topical preoccupations will be conjoined to some questions of codicology and pertinent history. The course will build upon a basic undergraduate acquaintance with the Middle English language and canon and will offer an introduction to manuscript studies.

FORMATS: Seminar

**ENGL 5227 Re-Imagining the Plot in Selected Shakespearean Tragedies**

CREDIT HOURS: 3

Starting with Ben Jonson's Aristotelian account of plot -- "it behooves the action in a tragedy to be let grow, till the necessity ask a conclusion" -- this course explores the ways in which some of Shakespeare's tragedies adhere to or depart from the principles of Aristotle's *Poetics*.

FORMATS: Seminar

**ENGL 5235 Milton's Paradise Lost**

CREDIT HOURS: 3

This seminar is intended both for students who are familiar with the poem and for those who will be coming to it for the first time. We will read the poem closely, book by book, and examine the poem in its historical, intellectual, and literary contexts. At the same time, we will consider some exemplars of the major twentieth-century critical approaches to the poem.

FORMATS: Seminar

**ENGL 5236 Poetry and Rhetoric in Early Modern Culture**

CREDIT HOURS: 3

The central aim of this course will be to evaluate the achievement of English poetry during the sixteenth and early seventeenth centuries. We will question primarily through a study of short poems, their relation to the influential rhetorical works, and their relation to each other.

FORMATS: Seminar

**ENGL 5238 Othello and Its Afterlife**

CREDIT HOURS: 3

This course focuses on a single play by Shakespeare as a key site where early modern notions of race, gender and class converge. It begins by interrogating

the apparent stability of Shakespeare's text, which exists in alternative authoritative versions (Quarto and Folio) and is always mediated by the conditions of a playhouse in which white males play both women and blacks. We'll aim to unpack the complex, cultural constructions of gender and race with which this play is so deeply concerned by studying a range of contemporary discourses (primary source material on microfilm) as well as Shakespeare's own *Titus Andronicus*, which anticipates some of *Othello's* preoccupations.

FORMATS: Seminar

### **ENGL 5265 Writing Women/Women Writing in Early Modern England 1540-1640**

CREDIT HOURS: 3

This half-credit course explores the context and range of women's writing in Tudor and Stuart England. Adopting a multidisciplinary approach, we will examine a range of works by and about women, from witchcraft trials and medical treatises, to poems, plays, translations and polemical pamphlets in an attempt to determine the relation of early women writers to their culture. Writers to be studied in depth include Mary Wroth, Elizabeth Cary, and Aemilia Lanyer.

FORMATS: Seminar

### **ENGL 5266 Mothers and Maternity in Early Modern England 1580-1670**

CREDIT HOURS: 3

This course explores motherhood in the culture and literature of early modern England.

FORMATS: Seminar

### **ENGL 5268 Gender and Politics in Jacobean London 1610-1624**

CREDIT HOURS: 3

The seminar will seek to understand the intersection between politics and gender during the turbulent Jacobean years. Beginning with the writings of King James himself, we will read widely in the prose, poetry, and drama of the period 1610-1624, from Shakespeare and Webster to Lady Mary Wroth.

FORMATS: Seminar

### **ENGL 5276 Spectatorship in Early Modern England**

CREDIT HOURS: 3

This seminar will focus on the subject of spectatorship in England in the early modern period. We will use a number of works from the visual arts to begin an examination of how spectatorship was depicted in various texts from the early modern period.

FORMATS: Seminar

### **ENGL 5280 The Theory and Practice of Literary Pleasure**

CREDIT HOURS: 3

An enquiry into some of the established ways of talking about literary pleasure, with a view to devising new and more persuasive ways of doing so.

FORMATS: Seminar

### **ENGL 5290 Writing Illness in Early Modern Literature**

CREDIT HOURS: 3

This Seminar examines the contexts and texts of early modern illness, considering the work of writers medical, literary, and popular. As well as examining the role of language in shaping the realities of mind and body, the course considers how those realities were shaped by a rapidly changing medical epistemology.

FORMATS: Seminar

### **ENGL 5306 The Restoration Theatre**

CREDIT HOURS: 3

This half-credit course traces various aspects of the English stage from 1660 to 1700. In addition to approximately a dozen plays, the course will consider the theatrical milieu of the period, including the audience, casts, and spectacular production techniques. Related political events and theoretical controversies will also be surveyed.

FORMATS: Seminar

### **ENGL 5316 Studies in the Eighteenth-Century English Novel**

CREDIT HOURS: 3

This half-credit course is devoted to the study of a special subject in the early English novel (e.g., Desire, the image of America, the comic novel, the rise of the female novelist).

FORMATS: Seminar

### **ENGL 5331 Eighteenth-Century Constructions of Authorship**

CREDIT HOURS: 3

This seminar considers the changing status of literary authorship in eighteenth-century England. Topics for discussion include patronage, plagiarism, literary biography, the advent of copyright, visual and satiric representations of authors, and the professionalization of letters.

FORMATS: Seminar

### **ENGL 5355 Eighteenth-Century Popular Literature and History: An Interdisciplinary Approach**

CREDIT HOURS: 3

This half-credit course engages in the interdisciplinary study of popular literature. Various theories of popular culture are considered. Students encounter relevant scholarship outside of literary criticism (e.g., art, legal, and economic history, social psychology, folklore, and music) by way of an examination of selected episodes in eighteenth-century English life.

FORMATS: Seminar

### **ENGL 5401 Communicable Romanticism: Viral Politics and Medical Discourse**

CREDIT HOURS: 3

This course will examine literary romanticism's debts to contemporary medical theories, especially in relation to the spread of ideas through the body politic.

FORMATS: Seminar

### **ENGL 5402 Literary Theories In/Of Romanticism**

CREDIT HOURS: 3

This course surveys a number of the debates and key texts essential to the study of Romanticism, including material from the Romantic period (c. 1780-1837) on authorship, representation, aesthetics, genre, and mode, with some attention in the final weeks to major approaches to Romantic literature in the twentieth century.

FORMATS: Seminar

### **ENGL 5403 The Gothic Century: Romanticism and Gothic Literature from 1764-1864**

CREDIT HOURS: 3

Romanticism has recently proposed the Romantic Century (1750-1850) to address changing ideas of the field, and this course will explore the heuristic value of an overlapping Gothic Century, from Walpole's *Castle of Otranto* (1764) to LeFanu's *Uncle Silas* (1864).

FORMATS: Seminar

### **ENGL 5408 Radical Arts, Romantic Acts: Reading John Thelwall**

CREDIT HOURS: 3

Uniting arts and acts of voice, literature, and politics at the turn of the romantic century, this seminar provides comprehensive introduction to the life and work of "Citizen John" Thelwall, orator, political/poetical activist, reformer, pioneer of free speech and maker of the English working class.

FORMATS: Seminar

### **ENGL 5414 Romantic Women Writers**

CREDIT HOURS: 3

Contributes to ongoing feminist reassessments of "English Romanticism" by surveying key genres and forms to which women made notable contributions (the sonnet, the Jacobin & gothic novel, the heroic epistle) and examining the nature of the influence that writers like Wollstonecraft, Smith, Barbauld, Hemans and Baillie had on their contemporaries and are having on current scholarship.

FORMATS: Seminar

**ENGL 5417 The 1790s: The Revolutionary Decade**

CREDIT HOURS: 3

This class focuses on the discourse of the 1790s, a turbulent transitional period in which vigorous debates about the rights of man and the wrongs of woman, the politics of class and race, reshaped literature even as they rocked the foundations of English society. Reading a range of canonical and non-canonical Romantic writers in their contemporary contexts, students will gain new insight into the origins of romanticism, as well as gaining a new perspective on current debates about the politics of literature.

FORMATS: Seminar

**ENGL 5419 Digital Romanticism & Print Culture: The Case of John Thelwall**

CREDIT HOURS: 3

This seminar will explore forms and functions of Romantic-era print culture, and its intersections with other cultural media from a perspective at once historical and practical, by offering students the opportunity to edit the works of the Romantic-era poet, orator, educator, political theorist and speech therapist John Thelwall.

FORMATS: Seminar

**ENGL 5423 Nineteenth-Century Literary Transnationalism**

CREDIT HOURS: 3

This study of selected generically mixed British and American nineteenth-century texts investigates the intersections of race, religion, gender, and nation. The course gives particular attention to historical connections linking the anti-slavery movement in the United States with British working-class activism, the Italian liberation movement, and nineteenth-century Zionism.

FORMATS: Seminar

**ENGL 5424 Postcolonial Victorian**

CREDIT HOURS: 3

This course explores some of the intertextual and historical dialogues connecting postcolonial to nineteenth-century literature by examining contemporary texts that engage with Victorian texts.

FORMATS: Seminar

**ENGL 5426 The Ethics of Victorian Fiction**

CREDIT HOURS: 3

This course examines the Victorian debates about the morality of fiction, about the ethical and philosophical implications of particular narrative choices, and about the social and moral role (real and ideal) of the novel. Readings include selected Victorian novels along with 19th and 20th -century theoretical writings on ethics and fiction.

FORMATS: Seminar

**ENGL 5427 Darwin's Sirens**

CREDIT HOURS: 3

Charles Darwin's *On the Origin of Species* (1859) and *The Descent of Man* (1871) had a radical impact on the intellectual, cultural, and social history of Victorian Britain. The notion that human evolution was the product of accident or chance not preordination nor inevitable progress and that women "selected" their sexual partners forced philosophers, scientists, and politicians alike to think about Britain's place in human history and the dangers of devolution for the human species. In this graduate seminar, we explore the multiple ways in which Darwin's contemporaries responded to evolutionary metaphors and analyze the ways in the selected writers address the underlying principles of evolution: the notion of a natural order, the eugenic implications of social and racial hierarchy, the atavistic dangers of error. From defense through excoriation of the New Woman, racial other, socialism, fascism, the rhetorical malleability of Darwin's theory will be a central issue.

FORMATS: Seminar

**ENGL 5450 Studies in the Victorian Novel: George Eliot and History**

CREDIT HOURS: 3

A study of George Eliot's novels and essays as contributions to 19th-century debates over historiographical styles and standards.

FORMATS: Seminar

**ENGL 5465 Victorian Women Writers**

CREDIT HOURS: 3

This course looks at fiction, poetry, and non-fiction prose by 19th-century women writers including Charlotte Brontë, George Eliot, Elizabeth Barrett Browning, Elizabeth Gaskell, and Harriet Martineau, considering their works both as part of the vigorous intellectual environment of Victorian Britain and as part of a burgeoning tradition of women's writing.

FORMATS: Seminar

**ENGL 5524 Sonic Fiction**

CREDIT HOURS: 3

This course will introduce students to the "auditory turn" in the humanities - a movement that challenges the dominance of the visual by analyzing how sound is conceptualized, technologized, politicized, materialized, and aestheticized. Over the course of the semester students will investigate not only how sounds are represented in literary texts.

FORMATS: Seminar

**ENGL 5530 Irish Literature and Bilingualism**

CREDIT HOURS: 3

This will be a broad examination of some key texts of 20th century Irish culture. We will pay special attention to Irish culture and bi-or multi-lingual and will also pay some attention to the play between media forms such as film, television and radio. The complex politics of language in Ireland will be a recurring topic.

FORMATS: Seminar

**ENGL 5562 Telling the Truth in America: Franklin to Faulkner**

CREDIT HOURS: 3

This course will examine the importance of the concept of truth in American literature and culture, and how it is reflected in the writings of a number of writers and thinkers from the Puritans to the twentieth century. Special attention will be given to the works of William Faulkner.

FORMATS: Seminar

**ENGL 5625 Studies in Modern Canadian Poetry**

CREDIT HOURS: 3

This course studies a selection, which varies from time to time, of major figures in Canadian poetry, from the beginning of the twentieth century to the present day. A mixture of theoretical approaches is encouraged.

FORMATS: Seminar

**ENGL 5635 Representation of the Urban in Canadian Literature**

CREDIT HOURS: 3

This course will challenge our learned associations of Canada as an inherently uninhabited space and consider the role of the Canadian urban landscape in producing cultural images and myth.

FORMATS: Seminar

**ENGL 5650 Nations Within: The Politics and Poetics of Native American Literature**

CREDIT HOURS: 3

Literature by First Nations writers poses a challenge to the ideas of nation and national literature. The study of Native Literature asks us to consider seriously the politics of literary representation and the way this politics is conditioned by literary reception.

FORMATS: Seminar

**ENGL 5680 Writing in Canadian: Globalization and Contemporary Canadian Literature**

CREDIT HOURS: 3

Beginning with an introduction to debates about globalization and literary studies, this course explores the tension between the local and the global in



contemporary Canadian literature. In an attempt to understand the relationship between cultural identity, nationalism, and literature in Canada, we also consider the popular scholarly reception of books on our reading list.

FORMATS: Seminar

### **ENGL 5681 The Irish in Contemporary Canadian Prose Writing**

CREDIT HOURS: 3

This course examines works of Canadian authors who draw on Ireland, Irish themes or the Irish in Canada in their writings, and the work of Irish-born authors living in Canada with Irish Canadian content.

FORMATS: Seminar

### **ENGL 5682 Papers Please: Identity Documents, Immigration, and contemporary Canadian Literature**

CREDIT HOURS: 3

Beginning with an introduction to the growing field of citizenship studies, this course considers how some Canadian writers have responded to various processes and technologies that seek to make immigrants more 'legible' to the state. Broadly we will ask, how do stories about 'being I.D. ed' affect the ways we understand the relationship between citizenship and print?

FORMATS: Seminar

### **ENGL 5811 American Lives**

CREDIT HOURS: 3

Drawing on a wide range of experiences and texts from the eighteenth and nineteenth centuries, this course is an exploration of possible lives, of the give and take between literary imagination and the other determining forces of life.

FORMATS: Seminar

### **ENGL 5812 Ideas of the Western**

CREDIT HOURS: 3

This course deals with representations of the American West in fiction and film, exploring the various cultural, social, and political functions that those representations have served.

FORMATS: Seminar

### **ENGL 5813 Literature of the American Prison**

CREDIT HOURS: 3

This course examines literary depictions of the prison in the US, paying particular attention to writings by prisoners. The course also surveys the modern prison's larger relations to literature, from the eighteenth century and sensationalist literature through to the current period of mass imprisonment and contemporary political autobiography.

FORMATS: Seminar

### **ENGL 5816 Malory**

CREDIT HOURS: 3

This seminar will study the whole of the late medieval *Morte Darthur* by Sir Thomas Malory, its criticism, sources, and influences.

FORMATS: Seminar

### **ENGL 5818 The Nature of America: Nature in American Literature and Culture**

CREDIT HOURS: 3

This course examines the function of the idea of nature in American literature and in the formation of the American cultural and national self-definition. A central theme will be the claim, explicit or implicit, that the new world affords a privileged and exclusive access to truth.

FORMATS: Lecture | Seminar

### **ENGL 5821 American Utopias**

CREDIT HOURS: 3

In this course, we focus on utopian and dystopian literature of the nineteenth century, while framing that focus with reading from earlier periods and from the twentieth century. We study a variety of topics, examining both literary Utopias and actual utopian societies in the US, but the course is designed to allow student entry points into other areas not explicitly covered.

FORMATS: Seminar

### **ENGL 5830 Reading American Modernism**

CREDIT HOURS: 3

This course looks at the initial reception of some central works of High Modernism as well as works that have been considered to be at its fringes. In doing so, it considers questions of how the canon was formed.

FORMATS: Seminar

### **ENGL 5841 Literary Talk: Modernism**

CREDIT HOURS: 3

This course discusses the variety of forms and strategies that were used to invent Anglo-American Modernism as a recognizable moment in literary history; that is, as a literary period, with its own techniques, central and marginal authors, paradigmatic stories, and boundaries.

FORMATS: Seminar

### **ENGL 5850 Aesthetic Scandals of the Twentieth Century**

CREDIT HOURS: 3

This course is based on some major aesthetic scandals of the twentieth century; literary, visual, and acoustic. The seminar explores such things as recurrent patterns of behavior in scandals, formalism as a technique for dissipating scandal, and the relation of scandal to canon formation and cultural capital.

FORMATS: Seminar

### **ENGL 5911 Between Literature and Philosophy**

CREDIT HOURS: 3

In this course, we consider the relations between philosophy and literature through the lens of several texts that seem to cross their respective discursive boundaries. In the words of philosopher Philippe Lacoue-Labarthe, philosophy has been defining itself against literature, insisting that it conveys truths that are absolute in nature and thus independent of its written medium. The theoretical texts we read in the course, by authors such as Plato, Kierkegaard, Nietzsche, Blanchot, de Man, Derrida, Cixous and Irigaray, however, explore the texture of language and reveal philosophy's dependence on literary devices. On the other hand, we examine the texts that belong to the domain of literature yet engage in a philosophical reflection, such as Kafka's parables, poetry by Walderman and Celan, and novels by Michel Tournier and Jeanette Winterson.

FORMATS: Seminar

### **ENGL 5917 Critical Theory: The Ethical Turn**

CREDIT HOURS: 3

Under fire for a lack of commitment in the 1980s, critical theory (postmodernism, post structuralism, and deconstruction) takes an "ethical turn" in 1990s to explore issues of social and political justice and to interrogate notions of identity, politics, and the social construction of gender. This course attempts to study some of these innovative critical interventions and to re-enact them in the classroom.

FORMATS: Seminar

### **ENGL 5919 Postcolonial Studies in the New Millennium**

CREDIT HOURS: 3

This course looks at recent literary and theoretical developments in postcolonial studies, including the shift away from identity politics and national allegory, which shaped the field in the 1980s and 90s. We read novels, theory, and scholarship from the new millennium in order to consider where postcolonial studies is now.

FORMATS: Seminar

### **ENGL 5935 Canonicity**

CREDIT HOURS: 3

This course considers the nature of literary value and the role of the "canon" in literary studies. Among the questions that may be addressed are the

following: is aesthetic value enduring or relative to specific social formations? What do we mean when we say a work is good or a classic? Its value something that inheres in a text or something assigned to it? How are literary canons formed and for what purpose?

FORMATS: Seminar

### **ENGL 5942 Gender and the Holocaust**

CREDIT HOURS: 3

This course focuses on the politics of gender in Holocaust testimonies, both eyewitness reports and fictionalized accounts. We read texts through the lens of theories of gender, trauma, and memory studies, asking questions about the impact of extreme violence on the intersectionality of oppression on the strategies of remembrance and representation, and on the transgenerational transmission of memory.

FORMATS: Seminar

### **ENGL 5944 Afrofuturism**

CREDIT HOURS: 3

This course focuses on non-realist works by African American and African Canadian authors and how non-realist modes respond to and challenge institutional and other forms of racism in North America. We will study critical theories of Afrofuturism, science fiction, and non-realism more generally. This course will engage African American history, theories of science fiction and race, gender, and queer studies.

FORMATS: Seminar

### **ENGL 5946 The Black Atlantic Goes Pop**

CREDIT HOURS: 3

This course explores the way that different strands of the African diaspora come to influence each other, especially in the realm of popular culture. Jumping off from Paul Gilroy's foundational work, this course asks how we might read representations of African diasporic interpenetration as working within a complex web of ideas about authenticity, identity, affiliation, hybridity, and originality. This course will consider a variety of forms and genres as well as theoretical and critical readings

FORMATS: Seminar

### **ENGL 5952 Writing the Spanish Civil War: Literature, History, and Popular Culture**

CREDIT HOURS: 3

This graduate seminar seeks to examine the remembered stories of the Spanish Civil War through literature by George Orwell, Ernest Hemingway, W.H. Auden, and in film, with attention to Canadian representations of the conflict through poetry, fiction, reportage, magazines, and other print ephemera.

FORMATS: Seminar

### **ENGL 5970 Techno-Culture Studies**

CREDIT HOURS: 3

This course examines the history of technology and the ways in which technological developments have been imagined, represented, and resisted in literary texts over the course of the past century.

FORMATS: Seminar

### **ENGL 5971 Literature and Media**

CREDIT HOURS: 3

This course is designed to introduce students to the field of literary and media studies, covering representative texts from the 19th century to the present.

FORMATS: Seminar

### **ENGL 5972 Book Design in the Digital Age**

CREDIT HOURS: 3

This seminar is an introduction to the study of contemporary experimental book design through a series of case studies, which includes collage novels, concrete novels, hypertext, and new media writing. Students will examine how design elements foreground and thematize the narrative. How have new technologies historically influenced the form and content of literary narratives?

### **ENGL 5973 Climate Fiction**

CREDIT HOURS: 3

This course will focus on climate fiction, with particular attention to contemporary science fiction representations of climate change. It will also introduce students to the methodologies of ecocriticism, ecofeminism, and petro cultures, among others.

FORMATS: Lecture

### **ENGL 5974 Ecocriticism, Climate Change, and the Anthropocene in Canadian Literature**

CREDIT HOURS: 3

In *A Billion Black Anthropocenes or None* (2019), human geographer Kathryn Yusoff contends “[n]o geography is neutral,” an adaptation of Trinidadian Canadian author Dionne Brand’s anticolonial assertion that “no language is neutral.” Together, Yusoff and Brand speak to two principles that anchor this graduate-level class in ecocritical approaches to Canadian Literature: first, they assert that the stories we tell about the (un)natural world matter. Literary analyses can accordingly help us see how climate change is culturally mediated. Second, they remind us that Western notions of place, space, and climate are grounded in histories of colonial dispossession, racial inequality, nationalism, as well as gendered exclusions. By drawing broadly on ecocritical theory, then, this class turns to Canadian fiction, autobiography, poetry, and film

FORMATS: Seminar

### **ENGL 5996 Canadian Multicultural Fictions: Ethnicity, Race and Reading**

CREDIT HOURS: 3

Drawing on a wide range of theoretical writing about identity formation, ethnicity, race, diaspora, and migration, this course aims to develop a nuanced understanding of multiculturalism as it is represented by a number of contemporary Canadian writers whose narratives explore its pleasures and discontents.

FORMATS: Seminar

### **ENGL 8000 English MA Thesis Prospectus**

CREDIT HOURS: 0

This registers the students’ involvement during the winter term of their academic year-in-residence in developing the thesis prospectus for the MA and then in reading towards the thesis.

### **ENGL 9000 MA Thesis**

CREDIT HOURS: 0

### **ENGL 9530 PhD Thesis**

CREDIT HOURS: 0

## **Environmental Engineering**

Location:

Sexton Campus

5268 DaCosta Row

Room D215

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3960

Fax Number:

Email Address: [cregrad@dal.ca](mailto:cregrad@dal.ca)

Website: [www.environmental.engineering.dal.ca](http://www.environmental.engineering.dal.ca)

## Introduction

This program is comprised of faculty from different departments in the Faculty of Engineering who have research interests in the multidisciplinary field of environmental engineering. Graduate education in environmental engineering builds upon a strong foundation in science and engineering principles which are applied to the solution of important problems related to sustainable utilization of natural resources and protection of the environment.

Students have a wide choice of courses and research topics to meet their particular interests and needs. Graduate level courses in the areas of energy and environment, soil and water quality management, waste management and remediation, pollution control and environmental assessment are available in the Faculty of Engineering and other faculties offering graduate studies at Dalhousie University. Graduate students can also conduct field research studies on soil erosion, bio-chemical transport phenomena, engineered wetlands, bio-waste composting and bioremediation at the Bio-Environmental Engineering Centre jointly administered by the Faculty of Engineering and Faculty of Agricultural located in Truro, Nova Scotia.

## Facilities

Several modern, well-instrumented specialized laboratories in environmental engineering are housed in participating departments in the Faculty of Engineering. These specialized research laboratories include biochemical analysis, water quality, waste treatment, soil erosion, environmental measurements and hydraulics.

Graduate students also have access to excellent research facilities in the Bio-Environmental Engineering Centre (BEEC), the Centre for Water Resource Studies (CWRS) and the Canadian Residential Energy End-use Data and Analysis Centre (CREEDAC).

Graduate students have the technical support of highly qualified and experienced research support technicians and technologists in bio-chemical analysis, measurement and control systems, and design and manufacture of specialized research equipment.

## Staff

### Dean

**Newhook, J.**, BEng, MSc (TUNS), PhD (Dalhousie), PEng

### Graduate Coordinator

**Kurylyk, B.**, BSc, PhD (UNB), PEng

### Faculty

**Brooks, S.**, B.Tech(Hons) (Massey), PhD (Cambridge), PEng, biotechnology, food and bioprocess engineering, microstructure and processing relationships, soft materials

**Gagnon, G.**, BScE (Guelph), PhD (Waterloo), PEng, Associate Vice-President Research, Director, Centre for Water Resources Studies, cross-appointment with the School for Resource and Environmental Studies. Water and wastewater treatment, water quality, environmental engineering

**Hansen, D.**, BScE (Guelph), MScE (UNB), PhD (Ottawa), PEng, UG Co-op Advisor. Hydrology, river hydraulics, flow through porous media, municipal water systems

**Hughes, F. L.**, BSc, MSc, PhD, Energy security, modelling energy systems energy transition pathways

**Jamieson, R.**, BEng (TUNS), MSc (Dalhousie), PhD (Guelph), PEng, UG Environmental Program Coordinator. Hydrology, ecological engineering, contaminant transport

**Kurylyk, B.**, BSc, PhD (UNB), PEng, Graduate Coordinator. Coastal and marine hydrogeology, groundwater-surface water exchanges, cold regions hydrology, mathematical modeling, climate change impacts

**Lake, C.**, BEng (TUNS), PhD (UWO), PEng. Geotechnical engineering, geo-environmental engineering, geosynthetics performance

**Little, T.**, BScEng, MEng, PhD, wind energy, electric energy storage systems

**Pelot, R.**, BSc, MSc, PhD, risk analysis, operations research

**Liu, L.**, BSc (Nankai), MSc (Peking), PhD (Regina), PEng. Geo-Environmental engineering, environmental engineering, environmental modelling and decision-making

**Satish, M. G.**, BSc, BECivEng (My), MEng, PhD (Concordia), PEng. Water resources engineering, numerical modeling of flows, system optimization, open channel flow

**Somers, L.**, BSc Eng (UNB), PhD (McGill). Hydrology, hydrogeology, mountain water supply, wetlands, salt marshes, greenhouse gas emissions, climate change impacts and adaptation

**Stoddart, A.**, BEng, PhD (Dalhousie), PEng. Water Quality and Treatment

**Walsh, M.**, BEng (TUNS), MEng (McGill), PhD (Dalhousie), PEng. Water and wastewater treatment

### **Cross-Appointed Faculty**

**Price, G.**, (From Faculty of Agriculture) BSc (UBC), MSc, PhD (Guelph)

### **Adjunct (FGS)**

**Brazner, J.**, BSc, PhD (Wisconsin-Madison), MSc (Syracuse)

**Craig, S.**, BSc (Hons), PhD (Strathclyde)

**Drage, J.**, MSc (UNB) BSc (Dalhousie)

**Kennedy, G.**, BSc (McMaster), MSc (Waterloo)

**Ketcheson, S.**, BSc (McMaster), MSc, PhD (Waterloo)

**Kurek, J.**, BSc (SUNY), MSc, PhD (UNB)

**Mackie, A.**, BSc, MSc, PhD (Dalhousie)

**Rand, J.**, CAS (Acadia), BEng, PhD (Dalhousie)

## **Application Forms and Procedure**

### **General Information**

#### **Admissions Criteria**

All candidates must meet the admissions requirements of the Faculty of Graduate Studies, and any specific admissions requirements as listed under each program.

#### **Application Forms**

Application forms may be obtained from the Registrar's Office, Dalhousie University, PO Box 15000, Halifax, NS B3H 4R2, or through the university's website. Prospective students are encouraged to contact the Graduate Admissions Officer for program specific information.

#### **English Language Proficiency Requirement**

Information pertaining to the English language proficiency requirements is given in the Faculty of Graduate Studies Regulations Section 3.4.

#### **Fees**

Information pertaining to fees and expenses can be found online in the Admission section of the Dalhousie Website.

#### **Financial Assistance**

Information pertaining to financial assistance and scholarships can be found online in the Funding Opportunity section of the Dalhousie – Faculty of Graduate Studies Website.

#### **Health Insurance Requirement**

Information pertaining to health insurance requirements is given in the Resources and Services section of the Dalhousie Graduate Calendar

#### **Graduate Student Program**

The graduate student's program, including supervisory committee composition, will be entered in the Graduate Student Information System (GSIS) by the department and approved by the supervisor, the graduate coordinator and FGS. The details of the program should be submitted in the first month after initial registration. The composition of the supervisory committee should be entered by the end of the second term.

#### **Course Requirement**

At least three-quarters (75%) of the total course requirement for each graduate program must be taken at Dalhousie University.

#### **Leave of Absence**

Students may formally apply for a leave of absence in accordance with the Faculty of Graduate Studies Regulations, Section 5.8.

## **Master's Degrees**

A student's program of study for the master's degree may be either a research-intensive program (MASc) or a coursework-intensive program (MEng). Note that a thesis-based research master's degree is normally required to gain admission into the PhD program.

# **Master of Applied Science (MASc)**

## **Admissions Requirements**

A candidate to be considered for the Master of Applied Science research program must have obtained, with a high scholastic standing, an undergraduate degree in engineering or a degree in science with honours, or the equivalent, from a recognized university.

Candidates must also be recommended for admission by a faculty member in the Program for their application to proceed. Please note: a recommendation for admission is not a formal acceptance.

Candidates for the above degree may be required to take additional undergraduate subjects as a preparation for advanced courses or to give the candidate a suitable engineering background. Such subjects are seldom considered as part of the graduate program.

## **Academic Regulations**

### **Program Requirements**

A MASc graduate program consists of not less than 12 credit hours, the graduate seminar and thesis selected upon the advice of the thesis supervisor. Not more than one senior level undergraduate course may be taken as part of the 12-credit hour requirement.

### **Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least one seminar presentation.

### **Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the thesis supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All master's degree candidates must pass all graduate level courses, and any approved undergraduate course, with a grade of at least B-. Graduate students can only repeat one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

All master's degree candidates must also pass an oral examination of their thesis after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum grade as noted above shall be considered grounds for dismissal.

### **Time Requirement**

A student is required to register each term to maintain eligibility to continue their program of studies. See Faculty of Graduate Studies Regulations for policies regarding residency requirements and the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for Master's Thesis**

The thesis is to be prepared to conform with the standards of the Faculty of Graduate Studies.

To initiate the thesis defence, the form "Appointment for an Oral Examination & Thesis Submission Form – Master's Programs" must be submitted to the departmental Office at least 10 business days prior to the date of the oral defence. The department will coordinate the scheduling of the presentation and examination and assign a chair/moderator. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:

- i. Course work completed.
- ii. Seminar completed.
- iii. Supervisory committee approved.

## Master of Engineering (MEng)

### Admission Requirements

A candidate to be considered for the Master of Engineering course work program must have obtained an undergraduate degree in engineering or its equivalent with high scholastic standing from a recognized university.

Candidates must also be accepted by a faculty member in the Program they are seeking admission to be considered for admission in this program by the University.

### Academic Requirements

#### Program Requirements

A MEng graduate program consist of not less than 21 credit hours, the graduate seminar and the six-credit hour project. Undergraduate courses, in the area of a student's interest, not taken by the student for previous credit, may be included in the program, subject to prior approval. Not more than 6 credit hours may be undergraduate credit hours.

A project is required as a part of the program (six credit hours out of the required 27 credit hours). Projects require the appointment of a supervisor and one supervisory committee member.

#### Graduate Seminar

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least one seminar presentation.

#### Supervisor and Supervisory Committee

The Supervisory Committee will consist of the project supervisor (and co-supervisor) and at least one other member with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

#### Examination Requirement

All courses required to meet the degree requirements are considered essential courses. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses, and any approved undergraduate courses, with a grade of at least B-. Graduate students can only repeat one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

All MEng degree candidates must also pass an oral examination of their project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

#### Time Requirement

A candidate for a MEng degree will be required to spend at least twelve months full-time work on course work and the project. All students are required to register each term to maintain eligibility to continue a program of studies. See Faculty of Graduate Studies Regulations, Section 7, for policies regarding the maximum length of time for degree completion and extensions.

#### Procedures and Guidelines for Master's Projects

The project report is to be prepared to conform with the standards of the Faculty of Graduate Studies.

To initiate the project defence, the form "Appointment for an Oral Examination & Thesis Submission Form – Master's Programs" must be submitted to the departmental Office at least 10 business days prior to the date of the oral defence. The department will coordinate the scheduling of the presentation and examination and assign a chair/moderator. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:



- i. Course work completed.
- ii. Seminar completed.
- iii. Supervisory committee approved.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **ENVE 6000 Directed Studies in Environmental Engineering**

CREDIT HOURS: 3

This course is available to graduate students enrolled in a Masters program in Environmental Engineering wishing to gain knowledge in a specific area for which no graduate course is offered. Students are assigned an advisor and are required to produce a formal report at the end of the course.

### **ENVE 6800 Graduate Seminar - Master's Level**

CREDIT HOURS: 3

This seminar course is designed to provide graduate students with the opportunity to search the literature for information on current topics related to their projects/thesis. All graduate students pursuing MEng and MASc degrees in the Environmental Engineering program are required to take this course and offer their findings, orally in one presentation to the faculty members of the department and students, four months prior to the completion of their program. This presentation will be followed by a question and answer session. Graduate students might also be asked to submit a written version of their presentation skills, scientific content, ability to field questions and regular attendance. Graded pass/fail.

CALENDAR NOTES: This is a required course for all Master students in Environmental Engineering: (2) Registration of this course is required for the Fall and Winter terms only.

### **ENVE 8891 Work Term I.**

CREDIT HOURS: 0

### **ENVE 8892 Work Term II**

CREDIT HOURS: 0

### **ENVE 8893 Work Term III**

CREDIT HOURS: 0

### **ENVE 8894 Work Term IV**

CREDIT HOURS: 0

### **ENVE 8900 Master of Engineering Project**

CREDIT HOURS: 6

This course gives students the opportunity to complete an in-depth project in an area of environmental engineering under the supervision of a faculty member. The study may consist of an engineering project, a laboratory research project, a field project, a modeling project, an advanced design project, an analysis of research data, or some combination thereof. Students enrolled in the project must submit a report of their work to their supervisor and give an oral presentation to their committee (supervisor plus a minimum of one internal reader).

### **ENVE 9001 Master of Applied Science Thesis**

CREDIT HOURS: 0

## **Environmental Studies**

Location:

Kenneth C. Rowe Management Building  
6100 University Avenue  
Suite 5010  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3632

Fax Number: (902) 494-3728

Email Address: [sres@dal.ca](mailto:sres@dal.ca)

Website: [sres.management.dal.ca](http://sres.management.dal.ca)

## **Introduction**

The School is the centre for graduate environmental scholarship and research at Dalhousie. It is a leading institution in environmental management and capacity building in Canada and abroad.

At the core of the School are interdisciplinary teaching and research programs emphasizing rigorous inquiry and ethical practice as the foundation of responsible environmental and resource management. Efforts are devoted to addressing causes rather than symptoms and learning to anticipate and adapt to change. The School offers two Masters programs. One is a two-year Master of Environmental Studies (MES) degree which includes course work and a thesis. The other is a 16-month Master of Resource and Environmental Management (MREM) degree involving course work and an internship practicum. A combined 28-month MLIS/MREM program is also available.

In addition to working partnerships within the Faculty of Management, SRES draws on an extensive network of cross-appointed Dalhousie faculty and adjunct appointments from other universities, government departments and NGOs. SRES contributes to many programs and institutes on the Dalhousie campuses. The School, through its many teaching, research, and community service initiatives, strengthens the University's capacity in resource and environmental studies.

## **Staff**

### **Director of School**

Adams, M.

### **Academic Program Coordinator**

Sherren, K. (MES); Adams, M. (MREM)

### **Professor Emeritus**

Côté, R. P., BSc (Loyola), MSc (Memorial). Industrial ecology; marine environmental protection strategies; management of chemical hazards and wastes; environmental policy

**Duinker, P.**, BSc Agr (Guelph), MES (Dalhousie), PhD (UNB). Forest management and policy, environmental impact assessment, sustainable development, sustainability indicators, public participation and conflict resolution, forest biodiversity assessment, climate change and forests, public opinions on environment and natural resources, urban forests.

## Professors

**Beazley, K. F.**, BLA (Guelph), MA (Waterloo), PhD (Dalhousie). Biodiversity conservation; protected area system design; ecosystem and protected area management; focal species; landscape ecology and conservation biology; environmental ethics.

**Sherren, K.**, BES (Hons) (Waterloo), PhD (ANU). Cultural landscapes, natural resources management, multifunctionality, climate change adaptation and mitigation, visual methods, conservation on private land, policy settings.

**Tyedmers, P. H.**, BSc (Hons) (Waterloo), LLB, PhD (UBC). Food, ecological economics, biophysical accounting, sustainable development, fisheries and aquaculture, life cycle assessment, ecosystem services.

## Associate Professors

**Adams, M.**, BEng, MSc (Royal Military College), PhD (Dalhousie). Industrial ecology, community energy systems (renewable), sustainable industrial development, business sustainability, by-product valorization, eco-industrial networks, rural economic development, community/industry inter-relationships.

**Walker, T.**, BSc (Univ of Portsmouth), MPhil (Essex), PhD (Nottingham), PDF (Dalhousie). Management and remediation of contaminated sites, ecological impacts and mitigation of industrial pollution, ecological risk assessment and environmental effects monitoring, management of aquaculture impacts, management of Arctic and Antarctic natural resources, air pollution impacts on ecosystems.

## Assistant Professors

**Medeiros, A.**, BSc (Brock), MES, PhD (York). Freshwater systems; applying new methodologies to community-based research in the Arctic; influence of environmental change on aquatic trophic systems.

**Westwood, A.**, BSc (Winnipeg), PhD (Dal), PDF (Mitacs, NRCan). Forest ecology and management, boreal and Maritime forests, impact assessment, terrestrial species at risk, protected areas planning, knowledge exchange across the science-policy interface, and justice, reconciliation and reparations in science and research

**Zurba, M.**, BSc (Winnipeg), MNRM, PhD (Manitoba). Research focuses on equity, rights, participation, and collaboration relating to resource and environmental governance. Her work engages with primarily Indigenous communities around these topics. She also focuses much of her work on the development of policy and frameworks for global environmental governance.

## Cross-Appointed Professors

**Charlebois, S.**, BComm (Royal Military College), MBA (Research) (UQAM), DBA (Sherbrooke), Major Appointment is Dean, Faculty of Management. Food distribution, food policy, food safety, food security, and traceability.

**Gagnon, G.**, BScE (Guelph), PhD (Waterloo), PEng, major appointment in Civil Engineering. Water and wastewater treatment, water quality, environmental engineering

**Rainham, D.**, BES (Waterloo), MSc (Alberta), PhD (Ottawa), [Elizabeth May Chair in Sustainability and Environmental Health] Broad research interests are directed at understanding the associations between human health and ecological integrity. Geographic information science, spatial analysis and eco-epidemiology provide some of the tools and theories to guide his research. Current research uses wearable global positioning system technology to investigate the influence of neighbourhood characteristics on human health and measures of environmental sustainability.

**Rapaport, E.**, BSc (Wisconsin), MSc, PhD (Royal Inst. of Technology, Stockholm). Land use change; climate change and vulnerability analysis; using historical GIS as tool to investigate patterns of urban form change; adaptation of GIS base multiple criteria for siting residential land use, community gardens and bike ways.

**Sheehan, L.**, BSc (Alberta), MEDes, MBA, PhD (Calgary). Current research includes a stakeholder approach to strategic management and tourism destination management. Coauthor on research related to entrepreneurship and tourism, socially inclusive tourism, and risk and tourism.

**Ülkü, M. A.**, BSc (Bilkent), MSc (Çukurova), PhD (Waterloo). Theoretical modeling of service and manufacturing systems, the development of practical logistics policies for green supply chains, and such interdisciplinary topics as behavioural issues in operations management, sustainable consumption, and the mathematical modeling of societal problems. Ali believes in the “science and teaching of better.”

**Wright, T. S.**, BES (Waterloo), MES (Dalhousie), PhD (Alberta), major appointment in Faculty of Science Undergraduate Environmental Programs. Environmental sustainability in higher education; indicators of environmental sustainability; institutional environmental change; environmental education (particularly applying experiential and transformative learning theories).

## Cross Listed Faculty

- Cameron, G. A.**, BA (St. FX), MA (York), PhD (London), Faculty of Agriculture. Co-operatives, food sovereignty, re-localization, democratization, East Africa.
- Clark, S.**, BA (Guelph), MSc (Saskatchewan), PhD (North Carolina State), Faculty of Agriculture. Food taxes, health economics, applied agricultural econometrics.
- France, R.**, BSc, MSc (Manitoba), PhD (Toronto), Faculty of Agriculture, Environmental Sciences Department. Aquatic remediation, implications of shoreline development, urbanization and stream fish communities, wetland restoration.
- Gass, S.**, BSc (McGill), MES (Dalhousie), PhD (Scottish Association for Marine Science/Open University), Teaching Fellow (Ulster), Major appointment in Environmental Science Program. Biology, ecology and conservation of cold-water corals and biodiversity conservation.
- Greik Martin, J.**, BA, MSc (Wisconsin), MLIS (Dalhousie). Major Appointment in School of Information Management. Geospatial information, visualization and mental imagery, multimedia representation or information and cognition.
- Hughes, F. L.**, BSc (Carleton), MSc, PhD (Newcastle upon Tyne). Major appointment in Electrical and Computing Engineering. Energy security, climate change, renewable energy.
- Kevany, K.**, BA (Carleton), MEd, EdD (Toronto), Business and Social Sciences Department Faculty of Agriculture. Well-being, Social change, Community development, Community learning, Consciousness, Positive psychology.
- Schnurr, M.**, BSc (Queen's), MA (SOAS, London), PhD (UBC), International Development Studies. Environment and development, political ecology, agricultural biotechnology, environmental justice.
- Swan, L.**, BSc (Cal Poly), MAsc, PhD (Dalhousie), Major appointment in Mechanical Engineering. Energy storage, renewable energy, electric vehicles, energy demand analysis.

## Adjunct (FGS)

- Beresford, R.**, BSc (CBU), MSc, PhD Candidate (Dalhousie). Assistant Professor, Department of Indigenous Studies & Biology, Cape Breton University
- Bouman, T.**, PhD (Göttingen), Associate Professor, Department of Biology, Cape Breton University
- Bullock, R.**, BA (Laurentian), MES (Wilfred Laurier), PhD (Waterloo). Associate Professor, CRC Tier II and Director for Forest Interdisciplinary Research
- Cameron, R.**, BSc (UNB), MSc (Acadia). Protected Areas Branch, Nova Scotia Environment, and Labor
- Charles, A. T.**, BSc (Carleton), PhD (UBC), School of Environment, Saint Mary's University
- Cohen, A.**, BA (McGill), MA (UBC), PhD (UBC), Assistant Professor, Department of Earth and Environmental Science, Acadia University
- Doucette, L.**, BSc (Guelph), MSc (U Iceland), PhD (U of New England, Australia). Resource Scientist, Wildlife Division, Nova Scotia Department of Lands and Forestry
- Gaudet, Ceo**, BA, MEcon (Concordia); PhD (all but dissertation-Carleton/Ottawa); Civil Servant, retired.
- Groszko, W.**, BSc (Calgary), PhD (Dalhousie). Renewable Energy Coordinator, Ecology Action Centre
- Hanson, A.**, BSc (Mt. A), MSc, PhD (Western Ontario), Habitat Ecologist, Canadian Wildlife Service, Environment Canada
- Harper, K.**, BA (Middlebury College), MSc, PhD (Alberta), Environmental Programs, Faculty of Science, Dalhousie University
- Kernaghan, G.**, BSc, MSc (UBC), PhD (Alberta), Associate Professor, Department of Biology, Mount Saint Vincent University
- Lundholm, J.**, BSc (Queens), MES (York), PhD (Guelph). Professor, Department of Biology, Saint Mary's University
- Mason, B.**, BSc (Edinburgh), MSc (Alberta), PhD (Alberta). CEO, Verschuren Centre for Sustainability in Energy and the Environment.
- Oakes, K.**, BSc, PhD (Guelph), Industrial Research Chair in Environmental Remediation, Assistant Professor, Department of Biology, Cape Breton University
- Owen, R.**, BSc, MES (Dalhousie). Executive Director, Office of Sustainability, Dalhousie University
- Somogyi, S.**, Bach. Wine Marketing/PhD(Adelaide). Associate Professor, School of Hospitality, Food & Tourism Management, University of Guelph
- Steenberg, J.**, BSc, MES (Dalhousie), PhD (Ryerson). Climate Change and Forest Carbon Resource Analyst, Nova Scotia Department of Lands and Forestry
- Turner, B.L.**, BA (UTexas Austin), MA (UTexas Austin), PhD (UWisconsin Madison). Regent's Professor, Arizona State University
- vom Hagen, U.**, BA (UKonstanz), MA (UKonstanz), PhD (Humboldt Univ). Senior Corporate Strategist, Nova Scotia Department of Lands and Forestry
- Whalen, R.**, BA (SMU), M.A. (Chengchi Univ), J.D. (Northwestern), PhD (Northwestern). Assistant Professor, Faculty of Law, National University of Singapore
- White, K.**, BA (UNB), BSc (UWO), MSc (UWO). Ecologist/Senior Laboratory Instructor, Department of Biology, Cape Breton University
- Willis, R.**, BSc (Guelph), MES (Dal). Sr. Toxicologist and Risk Assessor, Dillon Consulting
- Wilson, J.**, BES (Waterloo), MA, IDPhD (Dalhousie), Consultant (self-employed).
- Zhang, X.**, B.Ag. (Sichuan Agricultural Univ), MSc (Sichuan), PhD (Waterloo). Research Chair in Applied Nanotechnology, Verschuren Centre for Sustainability in Energy and the Environment, Cape Breton University

# Admission Requirements

As established by the Faculty of Graduate Studies, the entrance requirement for both degrees is an Honours Bachelor Degree or the equivalent of honours with at least a B average (3.0 GPA) from a university recognized by the Senate of Dalhousie University. A four-year Baccalaureate degree may be considered as the equivalent of honours if there is significant evidence of independent research capacity.

**Deadline for completed applications is January 31, although MES applicants applying for tri-council funding (NSERC, SSHRC, CIHR) or NS Graduate Scholarship, must contact department by October 1 to notify of pending applications.**

## Master of Environmental Studies (MES)

The program is designed to train and mentor students in the process of independent research on natural resource and environmental issues, within a collegial, interdisciplinary community of scholars. Graduating students will be able to:

- Understand the traditions in knowledge creation, and locate their own methodologies within that broader context;
- Identify knowledge gaps in a chosen area of specialization via literature review and synthesis;
- Design and defend a viable and rigorous research project to fill research gaps and objectives, adapting methods as appropriate;
- Demonstrate broadened perspectives on natural resource and environmental issues;
- Act to research ethically;
- Exhibit critical thinking but also the principles of collegiality and mutual respect during academic critique;
- Manage the research process to implement research design in collaboration with a supervisory committee to a mutually acceptable deadline;
- Analyze collected data, evaluate results, and interpret its implications in the context of a chosen area of specialization; and,
- Create new knowledge in a chosen area of specialization.

For most students, the minimum program will occupy two calendar years (24 months). The minimum requirement is 21 credit hours and a thesis.

The 21 credit hours are made up as follows:

### *Course Requirements:*

- ENVI 5035.03: Research Design and Methods - taken in the first year of study
- ENVI 5009.06: Graduate Seminar - all MES students are expected to attend and participate, but only enroll in second year.
- ENVI 9000.00: Thesis (enroll in all terms)
- MGMT 5000.03: Management without Borders - a project-based course typically taken during the second year of study
- Students must select three electives in consultation with faculty supervisor.

## Master of Library and Information Studies/Master of Resource and Environmental Management (MLIS/MREM)

A 28-month course of study leading to the combined degrees Master of Library and Information Studies and Master of Resource and Environmental Management (MLIS/MREM). A total of 66 credit hours (27 MLIS, 18 MREM including an internship, MGMT 5000: Management Without Borders and 18 electives) are needed to complete the MLIS/MREM Program.

Applicants must gain separate and independent admission to both Schools. For further information, contact the MLIS Program Coordinator or the SRES Academic Program Coordinator.

## Master of Resource and Environmental Management (MREM)

The Master of Resource and Environmental Management (MREM) involves intensive coursework and an applied internship during a 16-month period. It graduates highly skilled professionals with the problem-solving tools and scientific (social and biophysical) understanding to create innovative solutions to resource and environmental issues.

The program's goal is to produce graduates who can confidently and collaboratively address the interdisciplinary dimensions of resource and environmental problems. The MREM degree is an advanced “professional” degree aimed at management and practical problem-solving.

The MREM involves three course work terms and one internship term. The internship will be undertaken during the summer months. The minimum course requirement is 39 credit hours. This includes the internship and five electives.

The elements of the MREM Program are:

### **Term One**

Required courses:

- ENVI 5504.03: Management of Resources and the Environment
- ENVI 5507.03: Environmental Informatics

Plus, two electives from relevant disciplines.

### **Term Two**

Required courses:

- ENVI 5505.03: Biophysical Dimensions of Resource and Environmental Management
- ENVI 5500.03: Sociopolitical Dimensions of Resource and Environmental Management
- ENVI 5205.03: Law and Policy for Resource and Environmental Management

Plus, one elective from a relevant discipline.

### **Term Three**

- ENVI 5501.03: MREM Internship

### **Term Four**

Required courses:

- MGMT 5000.03: Management Without Borders
- ENVI 5508.03: MREM Project

Plus, two electives from relevant disciplines.

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## **Course Notes**

All courses except MGMT 5000.03, ENVI 5009.03, ENVI 5501.03, ENVI 5508.03 and ENVI 9000.00 are open to students in other programs by permission of the instructor.

# Course Descriptions

## **ENVI 5001 Environmental Assessment**

CREDIT HOURS: 3

Students explore all aspects of environmental assessment (EA), with a focus on EA processes in Canada. The course examines professional practice in scientific, procedural, and political dimensions. Current cases are studied opportunistically. Students learn the materials through case studies, seminars, group projects and research papers.

CROSSLISTED: MGMT 4705.03

## **ENVI 5009 Graduate Seminar**

CREDIT HOURS: 6

Through student delivered seminars, this course will assist graduate students work through difficult theoretical or methodological challenges related to their research and help them hone skills as presenters and discussants. Along the way, students will be exposed to emerging issues and findings across a range of contemporary areas of enquiry.

## **ENVI 5010 Introduction to Environmental and Occupational Health**

CREDIT HOURS: 3

This course will introduce students to many of the principles and concepts underlying environmental and occupational health, focusing on human health. It will review the nature of a variety of agents, including chemical, physical, biological, ergonomic and radiation hazards, how these agents are dispersed and transformed in the environment, the pathways of human exposure to these agents, and characterization of the health effects resulting from exposure. It will present methods for evaluating and controlling hazards, including occupational hygiene evaluation techniques and risk assessment models used in environmental settings. A number of case studies will be covered in detail, including indoor air quality, heavy metals exposure, and organic dust in workplace environments. Special topics will include risk communication and health promotion in the workplace. The course will conclude with a summary of legislative initiatives and standards which have been implemented to protect human health and an evaluation of their effectiveness.

CROSSLISTED: CH&E 6001.03

## **ENVI 5011 Pollution Abatement: Monitoring, Mitigation and Management**

CREDIT HOURS: 3

This course will be relevant to students with an interest in the management of anthropogenic impacts or pollutants in the environment arising from industrial activities. The course will be broad in scope, reflecting the course instructor's experience in conducting academic research and management of environmental pollution and human impacted ecosystems.

RESTRICTIONS: Restricted to MES/MREM program students. Students outside SRES require instructor permission.

FORMATS: Lecture | Seminar | Discussion | Experiential Learning

## **ENVI 5021 Fisheries Management**

CREDIT HOURS: 3

This interdisciplinary course focuses on the theory and practice of fishery management, with emphasis on Sustainable Fishery Systems. It will address the structure and dynamics of fisheries, and key themes in managing fisheries for sustainability and resilience, through class seminars and discussion, as well as attendance at related fisheries and coastal events.

CROSSLISTED: MARA 5021.03

## **ENVI 5023 Qualitative Data Analysis**

CREDIT HOURS: 3

Qualitative data analysis is a rigorous practice that few research students get experience with before they tackle their own data. Qualitative data is not synonymous with "data about people" – it is descriptive, observational, or graphical data about any phenomenon that defies measurement – but we will focus in this course on understanding the human experience. Prior exposure to the theories and techniques of qualitative data analysis can improve research design and execution. This course will combine theory and practice. Theory will include research design, data collection, and analytical approaches. Practice will involve analyzing a small dataset for themes and interpreting those themes. Throughout, students will carry out a small-scale research project with secondary data, including a research proposal backed up by literature, a coding protocol informed by theory, interpretation and writing up the findings. Students who are undertaking or planning to undertake independent research with people, and have some background in general research methods, will find it a particularly good fit.

FORMATS: Seminar

### **ENVI 5031 Economics for Resource and Environmental Management**

CREDIT HOURS: 3

This course is designed as a one term introduction to economics for graduate students who do not have any or limited undergraduate economics training. However, it is also suitable for students with prior economics training who are interested in exploring the environment-economy relationship further. The course begins with a brief but intense guided tour of economics. We then focus on key topics in environmental economics, including among others: \* the sustainable economy \* theory of market failure, public goods, and externalities \* environmentalist critiques of economic thinking \* environmental and natural resource accounting \* economic valuation of the environment \* time in economic/environmental analysis. The final part of the class explores the theory and practice of a new discipline which better integrates environmental and economic analysis; namely the field of "ecological economics". The course is open to students in other parts of the University who are interested in economy and environment.

CROSSLISTED: MGMT 4031.03

### **ENVI 5035 Research Design and Methods**

CREDIT HOURS: 3

What is research? This question is central to the areas of inquiry touched upon in this course. In this course we will cover topics such as: the philosophy of knowledge creation; science wars; methodological literacy; approaches to analysis (rigor, triangulation, etc.); research proposal design (both qualitative and quantitative); intellectual property; inter/multi/transdisciplinary; research ethics; and knowledge dissemination. There are four key course objectives: 1) develop foundational understanding of key research concepts; 2) develop an ability to evaluate all forms of research; 3) prepare graduate students with the ability to execute individual thesis research projects through research proposal preparation and communication; and 4) provide graduate students with a general introduction to research related skills that will provide a foundation for research careers. Readings, discussion, guest speakers, and practical exercises will be used throughout the course. Please note that this course is not intended to teach any specific methodological tool, rather it is a point of departure for developing a sound research question and exploring potential research methods to answer the questions in a research proposal.

### **ENVI 5039 Indigenous Perspectives on Resource and Environmental Management**

CREDIT HOURS: 3

This course explores issues concerning Indigenous peoples' relationships with natural resources and settler populations within a broad socio-political-environmental context. We will review key Canadian and international laws and guiding frameworks affecting Indigenous participation and leadership in land and resource use, environmental management, and planning. In developing an understanding of Indigenous peoples' perspectives on resource and environmental management, direct engagement must be central to the process. Therefore, students will have the opportunity to learn directly from guest Elders and Indigenous leaders who are involved in resource and environment issues. Key readings in this course will also be by Indigenous scholars who are leading the way in shaping the discourse and approaches to Indigenous resource and environmental management. We will also consider approaches to collaboration and research that are developed by, with and for Indigenous communities.

CALENDAR NOTES: In addition to the standard course fee, a non-refundable Field School fee is required in advance.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: MGMT 4039.03

### **ENVI 5041 Environmental Education**

CREDIT HOURS: 3

Environmental education for all ages is a critical step in fostering sustainable behaviours and achieving higher level environmental goals. This course takes an interdisciplinary approach to studying environmental education, examining the cognitive and social science underpinnings of behaviour change. Through course readings and experiential "hands-on" learning opportunities, students are invited to critically evaluate how environmental educators create effective and authentically engaging programs. This course provides an overview of program evaluation techniques as well as environmental education in formal school settings, wilderness settings, urban environmental education, and how mass media influence environmental behaviour.

EXCLUSIONS: MGMT 4041.03

### **ENVI 5044 Patterns for Sustainable Industrial Development**

CREDIT HOURS: 3

It is becoming increasingly obvious that human economies depend on the products and services provided by healthy, functioning ecological systems. By studying the flow of materials and energy through industrial systems, industrial ecology identifies economic ways to lessen negative environmental impacts - through pollution prevention, innovative waste management strategies, improved energy efficiency, design for the environment, and promoting sustainability - within the carrying capacity of the surrounding ecosystems. The course will also include the social dimensions related to industrial ecology by focusing on the organization and management dimensions that are related to the reduction of industrial emissions, waste flows, energy use and usage of materials within in-company procedures and beyond the level of single organizations. The format will include lectures, seminars, discussion, and guest speakers.

CROSSLISTED: BUSI 6044.03

### **ENVI 5047 Biodiversity Conservation System Design**



CREDIT HOURS: 3

Biodiversity conservation systems are increasingly necessary as human activities dominate the landscape, seascape, and freshwater systems. Precise prescriptions for conservation design are evolving. The theory and practice of conservation system design are explored through lectures, student presentations, discussions, and exercises, as an active learning module involving the students, the instructor and the broader community. Topics include representation of ecological systems, focal species, population viability, habitat suitability, landscape ecology, connectivity, road ecology and planning for species shifts in response to climate change.

CROSSLISTED: MGMT 4047.03

### **ENVI 5048 Directed Study - Special Topics**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to ENVI 5049.

### **ENVI 5049 Directed Study - Special Topics**

CREDIT HOURS: 3

See ENVI 5048.

### **ENVI 5050 Special Topics in Environmental Studies**

CREDIT HOURS: 3

A suitable combination of directed readings, seminars, written assignments, individual study and discussion or laboratory projects in a prescribed area. Each separate topic must be approved by the Graduate Coordinator, at the request, in writing, of the instructor. A course outline must be submitted before approval can be given.

### **ENVI 5051 Special Topics in Resource and Environment Management**

CREDIT HOURS: 3

A suitable combination of directed readings, seminars, written assignments, individual study and discussion or laboratory projects in a prescribed area. Each separate topic must be approved by the Graduate Coordinator, at the request, in writing, of the instructor. A course outline must be submitted before approval can be given.

### **ENVI 5052 Special Topics in Environmental Studies**

CREDIT HOURS: 3

A suitable combination of directed readings, seminars, written assignments, individual study and discussion or laboratory projects in a prescribed area. Each separate topic must be approved by the Graduate Coordinator and the Faculty of Graduate Studies, at the request in writing, of the instructor. A course outline must be submitted before approval can be given.

RESTRICTIONS: Restricted to MES and MREM students, or permission of the instructor.

FORMATS: Lecture | Seminar | Discussion | Experiential Learning

### **ENVI 5059 SRES Research Seminar**

CREDIT HOURS: 3

The research enterprise extends well beyond the definition of a project, the collection and analysis of data, and the writing up of results. An essential element is the communication of ideas and findings, both in writing and orally, to one's peers and more broadly. This course has been established specifically to support the development of communication, critical thinking, and constructive feedback skills amongst students throughout the MES program and broaden perspectives on methodological and theoretical traditions in environmental research.

CALENDAR NOTES: MES students will register for this course each term until requirements are met.

COREQUISITES: ENVI 9000 (Thesis)

CROSSLISTED: ENVI 5009.06

RESTRICTIONS: Restricted to MES students only.

FORMATS: Seminar

### **ENVI 5101 Food Systems & Sustainability: Feeding the 10 Billion**

CREDIT HOURS: 3

This course explores the biophysical demands of feeding humanity and the known global-scale impacts. The complexities and trade-offs of major food

systems are evaluated via tools such as LCA and Dietary Scenario Analyses. Strategies to effect change are explored, including alternative production methods, shifting diets, and more.

EXCLUSIONS: SUST 3950 (2018/19 AND 2019/20) ENVI 5051 (winter 2018/19 and 2019/20) SUST 3101.03

FORMATS: Lecture | Discussion | Other (explain in comments)

### **ENVI 5106 The Canadian North: Environmental Change and Challenges**

CREDIT HOURS: 3

This course introduces the Canadian North through an examination of the challenges faced by northern peoples. Emphasis is placed on the causes and consequences of global environmental change, and interactions with ecological processes and challenges for the human environment. Inuit perspectives of ecological knowledge will complement discussions on planning and development in a warming future. Principles of ecosystem management and emergent challenges for a sustainable future will also be addressed.

CALENDAR NOTES: Co-located with SUST 3106

RESTRICTIONS: Restricted to: Master of Environmental Studies and Master of Resource and Environmental Management. Students outside SRES require instructor permission.

EXCLUSIONS: SUST 3106.03

FORMATS: Lecture | Discussion | Other (explain in comments)

### **ENVI 5204 Coastal Zone Management**

CREDIT HOURS: 3

This seminar is designed to introduce students to the concepts, principles, approaches, and issues associated with integrated management of coastal zones worldwide. Coastal zones are critical areas of transition between land and sea, involving complex overlaps between resource uses and government jurisdictions. This course will address the legal, policy and administrative frameworks prevailing in Canada, but will do so within the global context of coastal zone management. Case studies and examples from developed and developing countries will be used to present practical approaches to the management of multiple uses in coastal zone, including community-based management models. The seminar will be conducted by lecture, formal student presentations, questioning and discussions of course material.

CROSSLISTED: LAWS 2041.03, MARA 5009.03

### **ENVI 5205 Law and Policy for Resource and Environmental Management**

CREDIT HOURS: 3

This course provides students with an overview of substantive and procedural aspects of Canadian law and policy related to natural resources and the environment. The course will involve lectures, guest speakers, seminar discussions and class participation. Strong emphasis is placed on the Canadian legislative and regulatory framework and the unique character of the regulated subject areas such as toxic substances, air and water quality, fisheries, forests, agriculture, minerals, parks, and biodiversity. The role of the common law in preventing or redressing environmental degradation will also be addressed.

CROSSLISTED: MGMT 4205.03

### **ENVI 5500 Socio-political Dimensions of Resource and Environmental Management**

CREDIT HOURS: 3

The goal of this course is to introduce students to the social, cultural, and political dimensions regarding resource and environmental management. Key objectives are to introduce, analyze, and utilize a range of frameworks for understanding the human dynamics of resource and environmental management decision-making. Because this course is integrated with ENVI5205 (biophysical dimensions of resource and environmental management) and ENVI5505 (law/policy dimensions of resource and environmental management) in the same term as required for the MREM program, there is a focus on common case studies to demonstrate the interconnectedness of these dimensions. Student groups in this course undertake in-depth investigation of the socio-political elements of resource and environmental management cases in Atlantic Canada.

CROSSLISTED: MGMT 4500.03

### **ENVI 5504 Management of Resources and the Environment**

CREDIT HOURS: 3

Students explore key management concepts applied in managing natural resources and the environment. Topics include management paradigms, systems, principles, approaches, tools, and institutions associated with a wide range of sectors such as fisheries, forests, agriculture, the coastal zone, oceans, parks and protected areas, energy, waste, water, and others. Case studies complement lectures, seminars, and field trips.

CROSSLISTED: MGMT 4504.03

### **ENVI 5505 Biophysical Dimensions of Resource and Environmental Management**

CREDIT HOURS: 3

This course will introduce students to techniques and tools employed in natural resource and environmental management programs and projects and engage students in case-based problem-solving learning intended to understand how bio-physical information is utilized in assessing resource and environmental issues and contributing to effective decision-making. Some of the tools that will be reviewed are environmental impact assessment, environmental site assessment, life cycle analysis, environmental monitoring and adaptive environmental assessment and management.

CROSSLISTED: MGMT 4505.03

### **ENVI 5506 CSR in Natural Resource Sectors**

CREDIT HOURS: 3

The course introduces students to the concept of Corporate Social Responsibility (CSR) and how it is applied in natural resource sectors including oil & gas, mining, agro-food, seafood, and forestry. Both theoretical and practical aspects of CSR are addressed, giving students a solid base of knowledge to become CSR practitioners in natural resource sectors. An overview of the global environmentalist movement is first presented to give students some context on where the concept of sustainability came from and how the expectations from the business community have changed over time. The link between sustainable development and CSR is discussed. The business case for CSR is explained along with the review of alternative business models. The practice of CSR in each sector is covered independently first looking at the nature of industry, the main sustainability issues and what practical steps businesses can take to contribute towards sustainability goals. Finally, practical ways of integrating CSR in a business strategy are reviewed. The format of teaching will include lectures, guest speakers, in-class discussion, and student presentation with three lecture hours per week. This course is offered in alternating years and will next be offered 2021/22.

RESTRICTIONS: Undergraduates must request permission from the instructor prior to being able to enroll.

FORMATS: Lecture

### **ENVI 5507 Environmental Informatics**

CREDIT HOURS: 3

Environmental informatics refers to digital systems for environmental monitoring, analysis, communication, and decision making. The course will cover digital data and where to find it; how to access such data ethically and manage it intelligently; tools and techniques necessary for making best use of those data; and a working knowledge of a subset of those datasets, tools, and techniques, including census, spreadsheets, database management systems and geographic information systems.

CROSSLISTED: MGMT 4507.03

FORMATS: Lecture | Lab | Discussion

### **ENVI 5508 MREM Project**

CREDIT HOURS: 3

The MREM Project represents the culmination of the MREM program. Working with a faculty advisor, each student undertakes an independent project, which is assessed via a scholarly report and an oral presentation. The topic is often, but does not have to be, related to the work undertaken in the MREM Internship.

PREREQUISITES: ENVI 5501.03: The MREM Internship or ENVI 5509.00: MREM Internship

FORMATS:

### **ENVI 5509 MREM Internship**

CREDIT HOURS: 0

A 0-credit requirement which consists of a 12–16-week placement with an organization involved in resource and environmental management. Students gain practical experience by working under professional supervision on key issues faced by the host organizations.

CALENDAR NOTES: Offered in summer of first year of the MREM program.

RESTRICTIONS: Restricted to MREM students only.

EXCLUSIONS: ENVI 5501.03

FORMATS: Experiential Learning

### **ENVI 6100 Information in Public Policy and Decision Making**

CREDIT HOURS: 3

This course addresses the role(s) of information in policy and decision-making at local, national, and international levels. Evidence-based policy making is relatively new and challenging. This course examines the research-policy interface, especially enablers and barriers to use of information of several domains and uses case studies to illustrate concepts.

CROSSLISTED: PUAD 6150.03, INFO 6100.03

FORMATS: Lecture

## French

Location:

Marion McCain Arts and Social Sciences Building  
6135 University Avenue  
Room 1114  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-6816

Fax Number: (902) 494-1626

Email Address: [french@dal.ca](mailto:french@dal.ca)

Website: [www.dal.ca/faculty/arts/french.html](http://www.dal.ca/faculty/arts/french.html)

## Staff

### Chairperson of Department

**Mopoho, R.**

### Graduate Coordinator

Please refer to Website for current Coordinator

### Professors Emeriti

**Bednarski, H. E.**, BA (London), MA (Dalhousie), PhD (Laval). Quebec literature and culture, literary translation

**Bishop, M.**, BA, BEd (Manchester), MA (Man), PhD (Kent, Canterbury). Poetry and poetics, modern and contemporary literature, contemporary culture, French art, symbolism, nineteenth-century literature

**Frigerio, V.**, Beaux Arts (Geneva), BA (York), MA, PhD (Toronto). Nineteenth-century literature, Romanticism, popular writing, Swiss-French literature, sociocriticism

### Professors

**Elson, C.**, BA (Vind), MA (Dalhousie), Dr de 3e cycle (Sorbonne). Modern and contemporary literature and culture, theory, philosophy, art, music, cinema

**Oore, I. Z.**, BA (Tel-Aviv), MA (Waterloo), PhD (Western). Quebec literature and culture

### Associate Professors

**Aïssaoui, D.**, DEA (Metz), PhD (Ottawa). Seventeenth and eighteenth-century literature, travel literature, self-writing, Maghreb francophone literature

**Masse, V.**, BA, MA (McGill), PhD (Toronto). Late medieval and sixteenth-century literature, early modern ephemeral literature, contact literature, exoticism, apocalyptic literature

**Milicevic, J.**, BA (Belgrade), MA, PhD (Montreal). Linguistics (morphology, lexicology, semantics, pragmatics), translation

**Mopoho, R.**, BA (Yaounde, Cameroon), MA, PhD (Montreal). Linguistics, lexicology, the science of translation

### Assistant Professor

**Simedoh, V.**, BA, MA, BEd (Fribourg, Switzerland), PhD (Queen's). Francophone literature, translation, literature, and culture of Francophone minorities outside of Quebec

### Adjunct (FGS)

**Edwards, J.**, BA (UWO), MA, PhD (McGill), Saint Francis Xavier University

**Steele, L.**, BA (UBC), MA, PhD (Man), Mount Saint Vincent University

**White, J.**, BA (Oregon), MA, PhD (Alberta).

## Master of Arts (MA)

### Master of Arts (MA) with Thesis

For general admission rules, see the [Faculty of Graduate Studies regulations](#).

1. Courses leading to the MA degree in French are offered in the areas of French and francophone literatures and cultures, French and general linguistics, and second language studies. Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies and must show evidence of proficiency in spoken and written French. A minimum B+ average (3.30) from a university of recognized standing is required.
2. Students may be accepted on a full-time or a part-time basis. A full-time student must spend a minimum of one year in full-time graduate study. Part-time students may carry a maximum of 15 credit hours (corresponding to 5 one-term courses) for one year.
3. The equivalent of at least 27 credit hours is required. This will consist of a thesis (usually equivalent to 12 credit hours) plus 15 credit hours at the 5000-level, including three credit hours in Research Methods.
4. When necessary, in order to improve the student's proficiency in French, up to 6 credit hours, undergraduate or graduate, may be required.
5. The thesis, written in French, is to be submitted and approved within the time limits set out in the Faculty of Graduate Studies regulations of this calendar.

### Master of Arts (MA) without Thesis

For general admission rules, see the [Faculty of Graduate Studies regulations](#).

1. Courses leading to the MA degree in French are offered in the areas of French and francophone literatures and cultures, French and general linguistics, and second language studies. Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies and must show evidence of proficiency in spoken and written French. A minimum B+ average (3.30) from a university of recognized standing is required.
2. Students may be accepted on a full-time or a part-time basis. A full-time student must spend a minimum of one year in full-time graduate study. Part-time students may carry a maximum of 15 credit hours (corresponding to 5 one-term courses) for one year.
3. The equivalent of at least 27 credit hours is required (i.e., 9 one-term courses), distributed as follows:
  - i) Required Course: FREN 5996: Independent Studies, serving as an integrative capstone course
  - ii) Required Elective Courses. 3 credit hours in Literature, 3 credit hours in Linguistics, 3 credit hours in culture or "bridging" courses (e.g., Contemporary Culture, Linguistics and Literature).
  - iii) General Elective Courses. 5 courses (from regular calendar offerings).
4. When necessary, in order to improve the student's proficiency in French, up to 6 credit hours, undergraduate or graduate, may be required.

## Doctor of Philosophy (PhD)

For general rules, see the [Faculty of Graduate Studies regulations](#).

The admission requirements are as follows: An MA thesis degree in French, an excellent French oral and written proficiency, a scholarly interest in one of the PhD thesis areas: all periods of French, Québec, Acadian, and Francophone literature and culture, with certain emphases, and the field of Linguistics, equally with particular emphases. Please consult the Department's PhD document for full details.

The requirements after admission are the following: Two years of Dalhousie residency, four full graduate credits (from the departmental offerings in the years of residency), a second language examination (within two years after admission), preliminary

and comprehensive written and oral examinations (not less than one year prior to submission of thesis), and the PhD thesis (normally written in French) and its oral defence.

## Selection of Courses and Registration

It is the responsibility of students admitted to one of the graduate programs to report to the Graduate Coordinator in the week preceding the beginning of classes, or earlier. The purpose is a briefing interview, the final selection of courses, completion of course selection forms and the drawing up of the program of graduate studies. All graduate students must be registered before classes begin.

## Thesis Areas

### Literature

French literature from the Middle Ages to the 21st century; Quebec, African and Caribbean literatures; popular literature, mass culture, bande dessinée, écriture féminine, travel literature, literature of the self; Francophone cinema; discourse analysis, deconstruction, mythocriticism, post-modernism, post-structuralism, sociocriticism, postcolonial theories.

### Linguistics

Semantics and lexicology, syntax, morphology; sociolinguistics; translation and terminology; linguistics applied to language teaching (learner's dictionaries, adaptation of linguistic tools for language teaching).

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

What follows is a list of PhD and MA courses. Courses required in particular cases will be specified in each student's Program of Graduate Studies. Only a limited number of courses is offered in any given year. Descriptions of the graduate courses offered in a particular year will be made available to students. Unless specified otherwise, all courses are given in the seminar format.

## Course Descriptions

### **FREN 5000 Méthodes de recherche I / Research Methods 1**

CREDIT HOURS: 2

2-part introduction to bibliographical research and styles of presentation geared to individual thesis projects. Includes sessions on electronic search tools and the establishment of a properly formatted working bibliography in the thesis field. The first part (FREN 5000) is a seminar for all new M.A. (with Thesis) and PhD students, usually given by the Graduate Coordinator.

FORMATS: Seminar

### **FREN 5001 Méthodes de recherche II / Research Methods 2**

CREDIT HOURS: 1

2-part introduction to bibliographical research and styles of presentation geared to individual thesis projects. Includes sessions on electronic search tools and the establishment of a properly formatted working bibliography in the thesis field. The second part (FREN 5001) consists of individual meetings with the student's Supervisor.

FORMATS: Seminar

### **FREN 5002 Méthodes de recherche / Research Methods**

CREDIT HOURS: 3

Introduction to bibliographical research and styles of presentation geared to individual thesis projects. Includes library workshops on electronic search tools and the establishment of a properly formatted working bibliography in the thesis field.

CALENDAR NOTES: Students are required to register in this course in both the fall and winter semesters, receiving a grade of IP in the fall and a final grade in the winter term.

### **FREN 5016 Aspects de la traduction/Topics in the Science of Translating**

CREDIT HOURS: 3

This course aims to acquaint students with aspects of the theory and practice of translation. It assumes no prior knowledge of the field and focuses on the following topics: the presentation of key principles and concepts in the science of translating, a discussion of major theoretical issues, a description of the methodology and the cognitive process involved in translation, an examination of pertinent approaches and techniques. Class work for evaluation purposes consists of oral presentations, a mid-term and a final exam, a term paper and the translation of a variety of texts from French into English and vice versa.

### **FREN 5110 Séminaire de lexicologie/Lexicology Seminar**

CREDIT HOURS: 3

The course is an advanced survey of the field of lexicology within the Explanatory-Combinatorial Lexicology paradigm. It focuses on fundamental concepts and formalisms needed to describe the structure of the lexicon and that of individual lexical units, combining theory with hands-on lexicographic experience, involving mainly (but not exclusively) French lexicon.

FORMATS: Seminar

### **FREN 5122 Créativité lexicale/Lexical Creativity**

CREDIT HOURS: 3

Detailed study of the main forms of lexical unit creation in the French language, namely derivation, compounding, lexicalization, abbreviation, and borrowing. Application to general language, as well as to literary and scientific texts. Class work: article and book reviews; oral presentations relating to word formation in any given special language or area of activity.

### **FREN 5124 Vocabulaire et culture/Vocabulary and Culture**

CREDIT HOURS: 3

Examination of the influence of societal structures, traditions, values, beliefs, ideologies, etc. on language in general, and vocabulary in particular. Texts from specific groups, areas, and eras will be analyzed for illustration. Oral presentations by students.

### **FREN 5125 Sémantique/Semantics**

CREDIT HOURS: 3

This course situates contributions to semantics from French scholars during the past 100 years in the broader context of international scholarship on semantics - the study of meaning which is the crossroads of linguistics, philosophy, psychology and anthropology. The course will focus on approaches to the study of meaning as they contrast with each other and as they evolve in the work of various scholars from Arsène Darmesteter (1846-1888) and Michel Bréal (1832-1915) to current practitioners of semantics.

### **FREN 5126 Aménagement linguistique/Language Planning**

CREDIT HOURS: 3

Study of the relationship between languages and society, with a special emphasis on the theoretical issues involved in the concept of language planning, the typology of multilingual settings, the promotion of languages, the design and implementation of language policies, the notion of language rights, and the preservation of endangered languages. Students will be required to make oral and written presentations based on relevant cases in Canada and around the world.

### **FREN 5127 Paraphrase en langue et en traitement automatique des langues/Paraphrase in language and Natural Language Processing**

CREDIT HOURS: 3

The course focuses on linguistic models of production of paraphrases and their use in Natural Language Processing (automatic text generation, reformulation, abstracting, machine translation) as a way to enhance the quality of automatically produced texts.

FORMATS: Seminar

**FREN 5181 Linguistique et Littérature/Linguistics & Literature**

CREDIT HOURS: 3

The class deals with interactions between the disciplines of linguistics, discourse analysis, and literary criticism.

PREREQUISITES: 3000-level French literature or linguistic class

FORMATS: Lecture | Seminar

**FREN 5295 Séminaire: Didactique des langues secondes/Seminar: Second-Language Teaching**

CREDIT HOURS: 3

This course will provide an introduction to the key issues in French second-language (FSL) teaching. It is primarily intended for French graduate students who are also teaching a first-year course in the French Department. In addition to a discussion of current trends in FSL education, there will be opportunity to practice skills in specific aspects of FSL teaching. As such, there is a strong practical component to this course, which will include peer and faculty classroom visits and critiques as well as micro-teaching during class time.

**FREN 5300 Séminaire de littérature médiévale/Mediaeval Literature Seminar**

CREDIT HOURS: 3

Topics will vary from year to year and could involve specific authors (e.g., Chrétien de Troyes, François Villon), specific genres (e.g., poésie courtoise, encyclopedic literature), or specific discursive phenomena (e.g.: mouvance of the texts, representations of Islam).

**FREN 5350 Aspects de la littérature des 14e - 16e siècles / Topics in Middle French Literature**

CREDIT HOURS: 3

Intensive research seminar dealing with selected Middle French discursive phenomena (14th-16th c.), underlining the continuities and discontinuities between the late Middle Ages and the early Renaissance.

FORMATS: Lecture

**FREN 5405 Séminaire de littérature du 16e siècle / 16th Century French Literature Seminar**

CREDIT HOURS: 3

Intensive research seminar dealing with one aspect of 16thc. French literature, such as a given genre (e.g., love poetry, the essay), a single author (e.g., Rabelais) and his fortune, or specific discourses and discursive phenomena (e.g., the rise and fall of cosmography, the advent of visualism).

FORMATS: Lecture

**FREN 5500 L'Aventure intellectuelle du Grand Siècle/The Intellectual Adventure of French Classicism**

CREDIT HOURS: 3

This course examines 17th-century French literature by focusing on a major writer, movement, genre or theme. Please contact the professor for details.

**FREN 5550 Aspects de la littérature de la première modernité/Topics in Early Modern French Literature**

CREDIT HOURS: 3

Intensive study of a specific aspect of French literature as it unfolded throughout the Early Modern period (16th - 18th c.), such as the invention or the transformation of a single genre (e.g., the autobiography, the novel), the reception of a specific author or idea (e.g. the Noble Savage), or broader issues such as satire, geographical literature, or religious heterodoxy.

FORMATS: Lecture

**FREN 5600 Le roman épistolaire du 18e siècle/18th Century Epistolary Novel**

CREDIT HOURS: 3

The course will focus on the rise of the epistolary novel as a literary genre and its influence on the development of fiction. The research conducted in the seminar will be an attempt to determine and to assess some elements for a theory of the epistolary novel in 18th century France. This will be done through the study of letter manuals and novels such as those of Madame Riccoboni or *Les Liaisons dangereuses* by Laclos. Novels will be studied in the intellectual context of the time.



### **FREN 5610 Ethique et esthétique de la nature dans l'art et la littérature du 18e siècle/Ethics and Aesthetics in 18th century art and literature**

CREDIT HOURS: 3

In this seminar students will examine on the one hand, theoretical writings dealing with the aesthetics of nature, and, on the other hand, the ethics of virtue and the vogue of sensibilité as reflected in selected 18th century literary texts (poetry, novel, short stories, *traits* ) and in art (painting, landscape architecture).

### **FREN 5700 La révolution romantique/The Romantic Revolution**

CREDIT HOURS: 3

Romanticism will be viewed as a rebellious and creative force which greatly contributed to the reshaping of traditional society. The course will attempt to evaluate the French Romantics in their intellectual and cultural significance, by defining Romantic characteristics, and studying Romantic aesthetics through their theoretical writings and their literary works. These will include works by Benjamin Constant, Mme de Staël, Chateaubriand, Lamartine, Vigny, Musset, Hugo, G. Sand and others.

### **FREN 5701 Le roman du 19e siècle/ 19th-Century Novel**

CREDIT HOURS: 3

The course involves the intensive study of an aspect of the 19th century novel. It may be the study of a major novelist of the 19th century (e.g. Dumas, Sand, Hugo, Stendhal, Flaubert, Balzac, Zola). Alternatively, the course may be organized around themes common to several novelists.

### **FREN 5702 Mouvements littéraires du 19e siècle/19th Century Literary Movements**

CREDIT HOURS: 3

Intensive study of an aspect of 19th century French literary movements, such as: romantisme, realism, symbolism, their interaction (e.g., naturalisme and décadentisme), and individual adaptations or refusal thereof.

FORMATS: Seminar

### **FREN 5705 Le poème en prose au 19e siècle/ The Prose Poem in the 19th Century**

CREDIT HOURS: 3

The prose poem is a literary genre that attained pre-eminence in the 19th century due in large measure to a reaction among writers against traditional poetics. The rise of the prose poem coincides with an attempt to find a “new language” that would express the spirit of modernism. Works studies will include Bertrand’s *Gaspard de la Nuit*, Baudelaire’s *Petits Poèmes en prose* and Rimbaud’s *Illuminations*.

### **FREN 5802 La poésie contemporaine/Contemporary Poetry**

CREDIT HOURS: 3

The evolution of modern poetic theory and textuality from poets such as Char and Frénaud, through Chérid and Bonnefoy, to Du Bouchet, Albiach, Bancquart and Réda.

### **FREN 5803 La littérature contemporaine/Contemporary Literature**

CREDIT HOURS: 3

Analysis, both in-depth and more cursory, of a wide range of contemporary literary oeuvres: from Simon, Roche, Chawaf and Cixous to Deguy, Jaccottet, Zins and Tellermann. Individual aesthetic conception and practice will be related to contemporary theoretical and critico-methodological considerations.

### **FREN 5804 Art et littérature/Art and Literature**

CREDIT HOURS: 3

Why write, why paint, Yves Bonnefoy asks. Multiple yet crisscrossing, chiasmic answers to this question will emerge from discussion of the writing and art of nineteenth and twentieth-century creators such as Desbordes-Valmore, Ingres, Flaubert, Corot, Zola, Cézanne, Aragon, Braque, Ponge, Ubac, Bonnefoy, Da Silva.

**FREN 5806 Poétique et théorie de la littérature/ Poetics and Theory of Literature**

CREDIT HOURS: 3

Various 20th century literary theoreticians and critics in the “Geneva” and “French” schools will comprise the subject matter of this course: Starobinski, Richard, Barthes, Todorov, Greimas et al. Topics might include thematic and/or phenomenological criticism, Marxist and ideological criticism, structuralism, post-structuralism, and semiotics.

**FREN 5807 Culture contemporaine/ Contemporary Culture**

CREDIT HOURS: 3

Discussion of contemporary cultural theory and practice in the work of writers, philosophers, artists, etc. such as Barthes, Baudrillard, Blanchot, Bonnefoy, Derrida, Hyvrard, Irigaray, Jaccottet, Lyotard, Tal Coat, Tàpies, Wittig.

**FREN 5809 Art, cinéma et littérature en France/Contemporary Art, Literature, and Film in France**

CREDIT HOURS: 3

This course will assess the practice and theory of contemporary creation in French painting and other plastic forms, film and literature. Discussion and analysis will lead both to work on a range of individually selected oeuvres and to one in-depth research project. It is hoped, equally, to establish the parameters of a broad contemporary aesthetics within which individual oeuvres may be understood to deploy themselves.

**FREN 5876 Aspects de la littérature du Canada français/Studies in French Canadian Literature**

CREDIT HOURS: 3

Major texts will be studied in depth and will be seen in relation to their unique social, historical, and political context and, above all, to the problematics of literature itself. Topics will vary from year to year and could involve examination of a single author, period, or genre, or equally, of broader issues.

**FREN 5877 Analyse de textes littéraires québécois/ Analysis of Quebec Literary Texts**

CREDIT HOURS: 3

Selected literary Québec texts from the Nineteenth and/or Twentieth Centuries will be closely analyzed (the selection may vary from year to year). Recurring images and myths, central themes, main structures will be discussed, and various critical approaches explored.

**FREN 5878 La théorie postcoloniale en littérature francophone d'Afrique et des Antilles/Postcolonial Theory in African and West Indian Literature**

CREDIT HOURS: 3

This course builds upon the elements of Francophone literature taught in the FREN 4811 literature course. It focuses on the African and West Indian Literature evolution in the postcolonial context. It aims at giving students a broader understanding of contemporary literary and linguistic theories.

**FREN 5879 Négritude, représentation et evolution dans la poésie et le roman francophone d'Afrique et des Antilles / Négritude : Representations in Poetry and Novels in Francophone Literature**

CREDIT HOURS: 3

This course intends to analyze, through the poetry of Césaire and Senghor, the foundations of Negritude, its aesthetics, and finally, its transformation that occurs as a rift between two visions, between the past and the future and its questioning in Francophone novels from Africa and the French Caribbean. The approach of the course will take into account the historical context, and by using literary and philosophical theories.

RESTRICTIONS: Restricted to Graduate Students.

FORMATS:

**FREN 5930 Aspects de la littérature populaire/Topics in Popular Literature**

CREDIT HOURS: 3

Intensive study of an aspect of popular literature written in French, such as specific genres (e.g., the detective novel, comics, the graphic novel), specific authors (e.g., Ragelias, Dumas), or means of distribution (e.g., la littérature de colportage). Depending on the year, the course can focus on any one century from the 15th to the 21st.

FORMATS: Lecture

**FREN 5995 Recherches indépendantes/Independent Research**

CREDIT HOURS: 3

**FREN 5996 Etudes indépendantes/Independent Studies**

CREDIT HOURS: 3

**FREN 5998 Recherches indépendantes/ Independent Research**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to FREN 5999.

**FREN 5999 Recherches indépendantes/Independent Research**

CREDIT HOURS: 3

See FREN 5998.

**FREN 9000 Master's Thesis**

CREDIT HOURS: 0

**FREN 9530 Doctoral Thesis**

CREDIT HOURS: 0

## German

Location:

Marion McCain Arts and Social Sciences Building  
6135 University Avenue

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2161

Fax Number: (902) 494-2719

Email Address: [german@dal.ca](mailto:german@dal.ca)Website: [www.german.dal.ca](http://www.german.dal.ca)

## Introduction

Graduate courses leading to the degree of MA are offered in the history of German literature and thought. Research in the Department is concerned principally with the literary and philosophical tradition of German Idealism, modernity, and the culture of the twentieth century. Special expertise in the following fields: Reception of Islamic Orient, Reception of Greek and Roman Antiquity, General and Comparative Aesthetics.

Language of instruction is German; the texts are also in German. Graduate students may concentrate on any of the periods or any particular aspect of the history of German literature and thought. Interested and gifted students may continue with doctoral studies under the supervision of Dalhousie Faculty at the University of Heidelberg. The Department also actively participates in The Interdisciplinary PhD Program offered by the Faculty of Graduate Studies.

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

## Staff

### Chairperson of Department

Sidler, J.

### Graduate Studies Coordinator

Schwarz, H. -G.

### Professor Emeritus

Gaede, F. W., PhD (Freiburg), FRSC

### Professor

Schwarz, H. -G., MA (Munich), PhD (McGill), McCulloch Chair, Lehrauftrag (Univ of Heidelberg)

### Associate Professor

Sidler, J., MA (Freiburg), MA (Dalhousie), PhD (Queen's)

### Cross-listed Faculty

Curran, T. H., MA, (Dalhousie), PhD (Durham, England)

### Adjunct (FGS)

Aurnhammer, A., Dr. phil. habil (Univ of Freiburg)

Grüning, H. -G., Dott. (Univ of Macerata)

Heuer, F., Dr. phil. (Univ of Heidelberg)

Joachimsthaler, J., Dr. phil. habil (Univ of Marburg)

Kanzog, K., Dr. phil. habil. (Univ of Munich)

Roesch, G. M., Dr. phil. habil (Univ of Heidelberg)

## Master of Arts (MA) Degree Program

Note: Admission to the MA program in German is suspended. The program will continue to be delivered to any current students until all students have graduated, or the time allowed for program completion has elapsed, or all students have left the program.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### GERM 5520 Goethe and the Enlightenment

CREDIT HOURS: 6

A study of German literature and thought of the time which preceded and witnessed the great revolutions of the 18th century.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### GERM 5530 Hegel's Aesthetics and the Ancients

CREDIT HOURS: 6

Study of Hegel's Aesthetics and Walter Pater's "Winckelmann" from the Renaissance as well as selected poetry of Goethe, Schiller, Hölderlin, Stefan George and Hugo v. Hofmannsthal.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5540 Kant and the History of German Idealism**

CREDIT HOURS: 6

A study of Kant's relation to modern Rationalism and Empiricism, and an inquiry into the principles of Idealism.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5550 Hegel: Phenomenology of Spirit**

CREDIT HOURS: 6

*The Phenomenology of Spirit*, published in 1807, was Hegel's first major work. He intended to write an introduction to philosophy by demonstrating the necessity of the advance from the most immediate form of knowledge to absolute knowledge. To achieve this, he had to write the *Phenomenology* as an introduction to his own philosophy.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5570 Goethe and Romanticism**

CREDIT HOURS: 6

A study of Goethe, Novalis, F. and A.W. Schlegel.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5580 Goethe's Faust**

CREDIT HOURS: 6

A close reading of Goethe's *Faust*, Part I and II, will give rise to questions about the unity of the work, the theory of drama and the reshaping of a legend. While Goethe's masterpiece stands at the centre, other German versions of the Faust legend will also be discussed in detail. Assignments will involve research into later echoes of the Faust legend as well.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5590 Studies in German Idealism**

CREDIT HOURS: 6

The specific content of the seminar varies from year to year but is always related to some aspect of Idealism.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5600 Heidegger and German Idealism**

CREDIT HOURS: 6

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5610 Literature of the 19th Century**

CREDIT HOURS: 6

A discussion of essential literary texts which throw a critical light on the growing forces of materialism and positivism.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5621 Modern German Literature I**

CREDIT HOURS: 3

Modern authors as witnesses of the philosophical and social changes of our century: a study of selected prose texts of Hugo v. Hofmannsthal, Robert Musil, Franz Kafka, Arthur Schnitzler, Hermann Broch, Thomas Mann and Günter Grass.

CALENDAR NOTES: This course is the first part of the former full-year course GERM 5620X/Y.06. This course description reflects the entirety of the pair

(GERM 5621.03 and GERM 5622.03).  
EXCLUSIONS: GERM 5620X/Y.06

### **GERM 5622 Modern German Literature II**

CREDIT HOURS: 3

Modern authors as witnesses of the philosophical and social changes of our century: a study of selected prose texts of Hugo v. Hofmannsthal, Robert Musil, Franz Kafka, Arthur Schnitzler, Hermann Broch, Thomas Mann and Günter Grass.

CALENDAR NOTES: This course is the second part of the former full-year course GERM 5620X/Y.06. This course description reflects the entirety of the pair (GERM 5621.03 and GERM 5622.03).

EXCLUSIONS: GERM 5620X/Y.06

### **GERM 5630 Aesthetics and Poetics**

CREDIT HOURS: 6

An historical study of the development of aesthetic theory and its foundation in the history of thought. Hegel's "*Aesthetik*", Heidegger's "*Ursprung des Kunstwerkes*" and Gadamer's "*Aktualität des Schönen*" will be studied.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5640 Ancient and Modern Dialectics**

CREDIT HOURS: 6

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5660 History and Theory of the German Novel**

CREDIT HOURS: 6

Representative works from the Baroque Age to the 20th Century are studied and the principles of the genre are discussed.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5670 Hegel's Philosophy of Nature**

CREDIT HOURS: 6

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 5700 Special Topics I**

CREDIT HOURS: 3

This is an intensive research seminar dealing with selected topics to be announced.

### **GERM 5701 Special Topics II**

CREDIT HOURS: 3

This is an intensive research seminar dealing with selected topics to be announced.

### **GERM 5800 Research Seminar**

CREDIT HOURS: 6

Special Research Topics Course. This is an intensive research seminar dealing with selected topics to be announced.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **GERM 9000 Thesis**

# Health Administration

## Location:

Sir Charles Tupper Medical Building  
5850 College Street  
2nd Floor  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-7097  
Fax Number: (902) 494-6849  
Email Address: [healthadmin@dal.ca](mailto:healthadmin@dal.ca)  
Website: [dal.ca/sha](http://dal.ca/sha)

## Objectives - MHA

The MHA program is accredited by the Commission on Accreditation of Health Care Management Education (CAHME), and the School is a full member of the Association of University Programs in Health Administration.

The School of Health Administration offers a Master of Health Administration (MHA) degree which meets the needs of those pursuing administrative careers in the Canadian healthcare delivery system. The program is designed to prepare individuals for careers in hospital administration, nursing administration, continuing care administration, public and community health administration and administration in municipal, provincial, and federal governments in health and health-related areas. There are employment opportunities for individuals with an MHA in policy, planning, evaluation, administration, and research.

The program seeks to provide a conceptual background for the increasingly complex managerial tasks that need to be performed in health institutions and health related governmental departments. Every effort is made to balance political, social, economic, cultural, medical, and ethical approaches to understanding the healthcare delivery system with those of the management sciences.

The emphasis in the program is on an academic, multidisciplinary, and professional education. It is academic in that it emphasizes knowledge of current research findings and treats the practice of health administration as phenomena subject to social scientific analysis. It is multidisciplinary in that faculty are drawn from traditional social and administrative sciences. It is a professional program in the sense that it will attempt to broaden the social perspectives of the student emphasizing that a professional has a social responsibility to society and must have an appreciation of the ethical standards appropriate to a career in health administration.

## Staff

### Director and Assistant Dean

**Packer, T.**, PhD, OT Reg (NS)

### Professors Emeriti

**Johnston, G.**, BSc (Hons) (McGill), MHSA (Alta), PhD (Western). Palliative and end of life care

### Professors

**Rockwood, K.**, BA (Memorial), MPA (Queen's), MD, FRCPC, major appointment in Faculty of Medicine

**Sketris, I.**, BSc (Pharm) (Toronto), PharmD (Minn), MPA (HSA) (Dalhousie), major appointment in College of Pharmacy

### Associate Professors

**Hajizadeh, M.**, BSc, MSc (Iran), PhD (University of Queensland, Australia). Inequalities in health and healthcare, healthcare financing and utilization, health policy, health economic evaluation

**Lahey, W.**, BA (Mt. A), BA (Juris) (Oxford), LLM (Toronto), major appointment in Schulich School of Law

**Mah, C.L., MD (Calgary) FRCPC PhD (Toronto).** Food environments, food and nutrition policy, diet-related diseases, population health interventions, public policy, public administration

**Persaud, D. D., MSc (Queen's), MSA (Central Michigan), PhD (Toronto).** Performance driven organizational innovation and change; organizational learning, innovation, adaption, and sustainability; vision care integration

### **Assistant Professors**

**Simms, C., BA (St. Mary's), MPA (Dalhousie), MHSc (John Hopkins), DPhil (Sussex).** Health policy, comparative health systems analysis, strategic planning, global health, and equity issues

**Parsons Leigh, J., BA (ST. FX), MA (York University), PhD, PDF (University of Calgary).** Applied health services research, public health interventions, pandemic preparedness, Health Administration ethics, equity, diversity, and inclusion

### **University Teaching Fellow**

**Hadskis, M., BSc (Hons), LLB (Dalhousie), LLM (Osgoode Hall Law School, York).** Legal aspects of healthcare administration, tort liability of healthcare professionals/institutions, regulation of biomedical research, neuroethics, end-of-life decision making

### **Adjunct (FGS)**

**Ashton, S., BSc (Hons), MBA (Dalhousie)**

**Farron, J., Bachelor of Law, MHA, Bachelor of Arts (advanced major in English)**

**Mouland, D., BSc, DHSA, MHSA (Dalhousie)**

**Schwartz, J., MBA/LL.B., B.Sc. (Psychology)**

**Stevenson, C., MHSA, CHE**

**Snow, C., CPA, CGA, BBA-IT/Acct (App)**

**Taghavi, M., BSc, MSc (Iran), PhD (McMaster)**

## **Application Procedure**

Application forms are available from the Registrar's Office of Dalhousie University. Applications should be submitted as early as possible. Application forms, letters of reference forms etc., can be downloaded at [https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission\\_requirements.html](https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission_requirements.html)

The following supporting documents are to be sent directly to the School:

1. Original transcripts of all previous academic work (two copies) (B+ average)
2. At least two academic letters of reference
3. Résumé/Curriculum Vitae
4. A statement of career interests and reasons for seeking admission to the MHA Program
5. GMAT (minimum score of 550)
6. English language proficiency for International Students (see below)
7. Faculty of Graduate Studies and Department copy of the application form.

### **Note:**

Letters of Reference must not be generic. They must articulate how the applicant's skills, experience and career objectives clearly fit the program.

The Statement of Career Interests must articulate the applicant's career goals and rationale as to how successful completion of the program is essential to achieving these career goals.

### **Deadlines for September admission:**

April 1 International - other, and Canadian automatic scholarship consideration

June 1 Canadian - final deadline (no automatic scholarship consideration)

The GMAT may be taken at conveniently located computer-based testing centres throughout North America and in many other parts of the world. Candidates in US and Canada may schedule a GMAT CAT (computer-adaptive test) appointment by calling either 1-800-GMAT-NOW or a local testing centre. Candidates can schedule their test within a few days of actually taking it. However, they should consider admission deadlines and call early to maximize their chances of securing their preferred test date at the centre most convenient to them. School of Health Administration GMAT Number is 0690.



Students for whom English is not their first language will need to submit proof of English language proficiency. Dalhousie accepts a number of English proficiency test scores. For more information, please see section 3.4 of the [Faculty of Graduate Studies Regulations](#).

CANDIDATES ARE ADVISED TO TAKE THE TEST(S) AT THE EARLIEST POSSIBLE DATE.

For international students, it is strongly recommended that all documents (transcripts and references) be submitted prior to April 1st.

## General Admissions Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. Enrollment in the School is limited. In general, successful applicants should have attained at least a “B+” standing in their previous university work - undergraduate degree, honours or equivalent, required.

Admission is based on an assessment of all documents as outlined in the [Application Procedure](#).

### Exemption

Applicants wishing to receive exemption from a required course should include course outlines for those courses previously taken which they consider to be equivalent to Dalhousie HESA courses. Where it is determined at time of admission that a student has the equivalent of a required course but is not granted advanced placement, an exemption may be permitted, so that another course is substituted for the required course.

## Master of Applied Health Services Research (MAHSR)

Admission to the Master of Applied Health Services Research (MAHSR) program is suspended. The program will continue to be delivered to any current students until all students have graduated, or the time allowed for program completion has elapsed, or all students have left the program.

## Master of Health Administration (MHA)

The MHA program offered through the School is available onsite, on either a full-time or part-time basis. Full-time students normally complete the program in sixteen months.

A part-time student may enroll in up to two and one-half credits in any one academic year. In order to ensure that graduate students benefit from a reasonable concentration of their studies, part-time studies must normally be completed within five years.

The MHA program is accredited through the Commission on Accreditation of Healthcare Management Education (CAHME). The MHA at Dalhousie University is one of only three programs in Canada with the prestigious CAHME Accreditation.

The Master of Health Administration degree features both an academic and results-oriented curriculum. It requires the successful completion of 15 three-credit hour courses and a six-credit hour Health Administration Residency. Please refer to the courses section for program requirements.

### IPHE 5900: Interprofessional Health Education

Students are required to maintain enrolment in IPHE 5900 for the duration of their studies. Successful completion of this course is a requirement for graduation and will be recognized further with the awarding of a special Certificate in Interprofessional Collaboration to be presented by the Faculty of Health. Students are asked to consult with their individual school/college to determine the specific guidelines and expectations regarding the required portfolio.

## Master of Health Administration (MHA) +: Legal Matters in Health Administration

Certificate in Advanced MHA Studies: Legal Matters in Health Administration

Students who enrolled in the Master of Health Administration program prior to Fall 2021, may obtain a Graduate Certificate in Advanced MHA Studies: Legal Matters in Health Administration.

The purpose of the MHA+ Certificate in Advanced MHA Studies: Legal Matters in Health Administration is to provide MHA students with advanced knowledge of the myriad legal matters in healthcare administration. The Certificate is not a free-standing, nor an entry-level credential. Certificate recipients can neither practice law nor represent themselves to imply the right or competence to practice law.

The four law-related courses will be completed concurrently with the MHA degree.

The four courses include:

- HESA 6360: Healthcare Law
- HESA 6361: Business Law for Health Administrators
- HESA 6362: Advanced Healthcare Law
- HESA 6366: Healthcare Law and Policy: Current Issues I
- HESA 6367: Healthcare Law and Policy: Current Issues II

MHA students choosing not to complete the Certificate, continue to access other elective courses.

Students should declare the MHA+ at the beginning of their program, however they may opt out and complete the regular MHA program of study.

## **Master of Health Administration (MHA) +: Strategic Decisions in Health Administration**

### **Certificate in Advanced MHA Studies: Strategic Decisions in Health Administration**

Students who enrolled in the Master of Health Administration program prior to Fall 2021, may obtain a Graduate Certificate in Advanced MHA Studies: Strategic Decisions in Health Administration.

The purpose of the **Master of Health Administration (MHA+) - Certificate in Advanced MHA Studies: Strategic Decisions in Health Administration** is to provide interested Master of Health Administration (MHA) students with advanced knowledge of the science of decision-making. The Certificate is neither a freestanding nor an entry-level credential.

The Certificate requires that students complete the following four courses, to be completed concurrently, with the MHA degree:

- HESA 6100: Ethical Decisions in Health Administration
- HESA 6341: Management and Union Relations: Decisions and Implementation
- HESA 6345: Healthcare Leadership: Decisions, Ownership & Accountability
- HESA 6400: Executive Decisions: The Dynamics of Bias, Risk & Persuasion

MHA students choosing not to complete the Certificate, continue to access other elective courses.

Students should declare the MHA+ at the beginning of their program, however they may opt out and complete the regular MHA program of study.

## **Master of Health Administration (MHA) Online**

Admission to the MHA on-line delivery mode is suspended at this time.

## **Master of Health Administration (MHA) Thesis Option**

Thesis option students can complete their MHA coursework within 16 months, however the time period to complete the thesis may be longer. Student research topics should be consistent with the School's research strategy and the availability of research supervisors. Course work and thesis option MHA students complete the same first 5 required MHA courses. Admission into the

thesis option occurs after completion of these first 5 required courses. A modified curriculum is then followed. The thesis option has not been accredited by CAHME.

## Juris Doctor/Master of Health Administration (JD/MHA)

The four-year JD/MHA program is a collaborative effort between the Schulich School of Law and the School of Health Administration. The combined JD/MHA enables students to select courses leading to degrees of Master of Health Administration and Juris Doctor.

Candidates for the JD/MHA program must satisfy the entrance requirements of both programs and may obtain further information about the combined program by contacting either the School of Health Administration or the Schulich School of Law. For admission, students must apply to both the School of Health Administration and the Schulich School of Law individually. Students applying for the MHA program may submit LSAT results in lieu of GMAT results. Please consult departments for program of study details.

Note: For all combined degrees, requirements for both programs must be met before a student can be convoked.

## Practicum/Fieldwork Placements Outside Halifax

Students enrolled in entry-to-practice graduate programs of study in the Faculty of Health are advised that they may have to do some or all of their required clinical education/fieldwork at sites outside Halifax, and hence may have to incur additional personal expenses for travel and temporary accommodation.

In some situations, sites may require a payment to the site for support of clinical education/fieldwork supervision, and some sites may require separate disability insurance in lieu of eligibility for Worker Compensation coverage. Such costs are the responsibility of the student.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

### Required Courses:

#### First Year

- HESA 6370: Canadian and International Health Systems
- HESA 5320: Epidemiology and Population Health
- HESA 5330: Management & Design of Healthcare Organizations
- HESA 5335: Information Systems and Project Management for Health Administration
- HESA 5341: Healthcare Economics: Evaluation and Policy
- HESA 5345: Accounting and Financial Management in Healthcare
- HESA 5350: Management Control and Funding Systems in Healthcare
- HESA 5505: Strategy and Change Leadership in Health Systems
- HESA 6360: Healthcare Law
- HESA 6505: Statistics for Health Administration
- HESA 6390: Health Administration Residency

#### Second Year

- HESA 6100: Ethical Decisions in Health Administration

- HESA 6305: Analyzing the Outcomes of Healthcare
- HESA 6310: Healthcare Policy
- HESA 6340: Human Resources in Healthcare
- HESA 6365: Quality Management in Healthcare

## Course Descriptions

### **HESA 5300 Introduction to the Canadian Health System**

CREDIT HOURS: 3

This course provides a brief introduction to the history, legislation, financing and payment systems, health professionals, health promotion, ethics and values, and trends (e.g., regionalization, consumerism, primary healthcare) in the Canadian healthcare system. The class is designed as an introduction to the Health Administration program. The discussion and tasks are directed toward the development of a lifelong and self-directed learning focus, the importance of networking and interpersonal skills, written and oral communication, and values. Note: Not offered in 2018-2019

### **HESA 5315 Managing Change in Health Systems: Sustainability and Adaptation**

CREDIT HOURS: 3

This class provides a theoretical and practical understanding of the design, implementation, and assessment of transformational and adaptive change processes within healthcare systems. Health system transformation is initiated and sustained by the broader social, political, technological, and economic context within which health systems function. Therefore, assessments of these and other factors related to health system change are examined. Specifically, topics that are covered include examining the environments of healthcare organizations, organizational culture, organizational effectiveness, knowledge management, organizational learning and innovation, business process reengineering, marketing in health systems, and creating and managing the future. Case analysis utilizing health systems examples, individual and group exercises, as well as the completion and presentation of a field project are used to facilitate participation and learning.

PREREQUISITES: HESA 5330.03

### **HESA 5320 Managerial Epidemiology**

CREDIT HOURS: 3

This class is designed for health administrators, not researchers. The course has three components: assessing the health status of a population using existing data; using Epi-Info for statistical analysis of associations (relative risk, odds ratio, chi-square test, confidence intervals, Mantel-Haenszel analysis, multiple logistic regression); and clinical guideline monitoring. Throughout the course, recurring themes are understanding the meaning of numbers, assessing validity, and ascertaining causation, including the concepts of confounding and effect modification. A lecture format with guest speakers and some discussion is used. There two required assignments (community health profile interpretation of statistical analysis) and one optional assignment (clinical guidelines) as well as mid-term and final exams.

PREREQUISITES: HESA 5330.03, HESA 6505.03

### **HESA 5330 Management and Design of Healthcare Organizations**

CREDIT HOURS: 3

Healthcare organizations are inherently complex and function in an increasingly dynamic environment. This course provides an introduction to the knowledge and skills necessary for the effective management of healthcare organizations. This is accomplished by examining the foundations of management thought, managerial roles, motivation, leadership, and job design as they relate to healthcare organizations. Additionally, topics such as organizational structure and design, teamwork, coordination and communication, and conflict management and negotiation will be examined. The major course objectives will be to provide opportunities for learning key concepts and theory in a setting which encourages discussion and feedback.

### **HESA 5335 Information Systems in Health Administration**

CREDIT HOURS: 3

The main objective of this course is to prepare health administrators to manage information systems and to use information technology effectively. The strength of the course is the use of real problems, situations, cases, and experiences as supplements to the textbook and references. Students are expected to learn about processes and issues related to planning, analysis, design, procurement, implementation and management of information and information technologies in the health system.

### **HESA 5341 Healthcare Economics**

CREDIT HOURS: 3

This course entails the study of health economics and its impact on health policy, funding, and service delivery. Students will learn the concept, theories, and methods of analysis of health economics; they will conduct a project-based health economics analysis and evaluation with reference to health policy. Students will identify assumptions used in analysis of economic issues, and explain the theory underlying the assumptions, notably the theories of consumer behavior and production as they relate to health. Important concepts to be covered include traditional theory of demand and supply and market equilibrium, the invisible hand and consumer choice, market failure, Pareto optimality and social welfare, elasticity, production and cost, public, private and quasi-public good, equity and redistribution. With the aforementioned framework as reference, the course will then focus on economic analysis and evaluation in the field with some coverage of related policy issues that are important for health care manager. Student will learn and apply techniques of economic analysis to current health issues with special emphasis on cost-effectiveness analysis, Cost utility analysis and cost benefit analysis. Students will learn the techniques of using patient-level data in economic evaluation and the basics of economic analysis using decision-making modelling.

### **HESA 5345 Financial Accounting, Governance and Management Control in Healthcare**

CREDIT HOURS: 3

The purpose of this course is to provide a basic understanding of management control techniques and management accounting decision making techniques and processes that exist for health administrators. The class will cover the following topics: an introduction to management control; financial statement and analysis; breakeven analysis; responsibility accounting; socio-economic aspects of budgeting; financial decisions and relevant costs.

### **HESA 5350 Management Control and Funding Systems in Healthcare**

CREDIT HOURS: 3

The purpose of this class is to provide a basic understanding of management control and decision-making techniques and funding systems that exist for health administrators. The course will cover the following topics: management control; performance budgeting; patient classification; work measurement; responsibility accounting; socio-economic aspects of budgeting; cost allocation; multi-year cost; financial decisions; relevant costs; and funding systems.

PREREQUISITES: HESA 5345.03

### **HESA 5505 Strategy and Change Leadership in Health Systems**

CREDIT HOURS: 3

An organization's strategic plan is key to its sustainability. Change is triggered when the plan does not achieve its desired goals. Topics to be addressed include: organizational effectiveness; strategic planning; environmental assessment; implementation, monitoring and evaluation; governance; organizational culture; organizational change; project management; organizational learning; and integrated delivery systems.

PREREQUISITES: HESA 5330

EXCLUSIONS: HESA 5315-Managing Change in Health Systems and HESA 6330-Strategic Planning in Healthcare are equivalent to HESA 5505-Strategy and Change Leadership in Health Systems.

FORMATS: Lecture

### **HESA 6000 Healthcare Leadership in the 21st Century**

CREDIT HOURS: 3

This course focuses upon the changing role and expectations for healthcare managers and leaders within the Canadian healthcare system. Class topics include leadership/organizational theories, values-based leadership, leadership theories, and evidenced based practice. Strategies for addressing common leadership/management challenges are covered through a variety of course activities including extensive readings, case studies, student presentations, and papers.

CROSSLISTED: NURS 6000.03

### **HESA 6100 Ethical Decisions in Health Administration**

CREDIT HOURS: 3

This course has three objectives: first, to raise the student's awareness of the ethical implications of decision-making in healthcare administration. Second, it will assist students in the development of approach for exploring and resolving ethical dilemmas in the workplace. Third, the course will assist students in examining and developing a greater understanding of their own value system as it relates to the decision-making and management practice. The course is a combination of case study analysis, group projects, guest speakers and self-directed study.

PREREQUISITES: HESA 5315

### **HESA 6305 Analyzing the Outcomes of Healthcare**

CREDIT HOURS: 3

Determining the outcomes of healthcare provision and measuring the performance of healthcare organizations are redefining how healthcare is strategized and delivered. This is a reflection of the urgent need to improve healthcare quality and the imperative of assessing healthcare interventions. The objective

of this class is to expose students to the origins of the medical outcomes movement, the importance of understanding the forces driving outcomes management, and the necessity of developing the requisite skills for managing healthcare organizations. Topics examined in the course include developing strategies for implementing an outcomes measurement system, assessing customer satisfaction and feedback, quality of life measurement, the utilization of health services, small area variations, clinical practice guidelines, disease management, measuring outcomes in long term care, the dynamics of waiting lists, and system performance measurement. Didactic lectures, case analysis, assigned readings, assignments which combine theoretical and practical application, and a final presentation providing detailed analysis of an outcomes management project will be used to expose students to this area of healthcare management.

### **HESA 6310 Healthcare Policy**

CREDIT HOURS: 3

This course introduces the student to the evolution of Canadian healthcare policy. Students are exposed to three streams of study which, when taken together, help to illuminate how our healthcare system has emerged over time. The first stream will provide a conceptual and practical examination of public policy making which delimits the art and science of crafting healthcare policy. Public policy analysis will be introduced in a way that provides an overview of techniques and issues that are applicable to an understanding of healthcare policy at the provincial and federal levels. With this approach providing the backdrop, a second stream concentrates on current developments in the Canadian healthcare system as both a direct and indirect consequence of explicit and implicit public policy decisions. Finally, to facilitate interactive learning, problem solving, and critical thinking, students are required to examine and analyze a number of contemporary healthcare policy issues.

PREREQUISITES: HESA 5300.03

### **HESA 6325 Continuing Care Administration**

CREDIT HOURS: 3

This course is designed to enable students to understand and appraise government policies that have shaped the direction of Long Term Care/Continuing Care in Canada with particular emphasis on Nova Scotia; organize and contrast a number of current structures that have been put in place to provide care to seniors; explain the concepts of aging, disabilities, dementia, and the social and medical model of care; and explain, compare, contrast, and critique a variety of issues in Long Term Care/Continuing Care including facility and community based care, leadership styles, aging in place, home care models, living wills/advanced directives and palliative care.

### **HESA 6330 Strategic Planning in Healthcare**

CREDIT HOURS: 3

The focus of the course is on the processes, methods, models and techniques of strategic planning and project management in a changing healthcare system. Relationships between strategic and operational planning will be explored, as will the factors that both inhibit or facilitate the planning process. The overarching objective of the class is to provide students with a firm grounding in the analytical, political, and interpersonal skills necessary to enable them to assess health needs, plan services accordingly, implement and to evaluate the planning process.

PREREQUISITES: HESA 6505 and HESA 5320

### **HESA 6340 Human Resources in Healthcare**

CREDIT HOURS: 3

The Canadian healthcare system, like many others, is facing unique challenges to the management of human resources. The healthcare environment poses particular challenges as governments and employers struggle with reform and restructuring, cost containment, and labor shortages. Human resource management is integral to the overall strategic planning process and key to organizational performance. Key industry leaders are calling for change and shifting focus to the healthy workplace to ensure success and sustainability in Canada's healthcare system. This course will provide the student with an opportunity to explore the challenges and best practices of administrative and operational management of human resources within the healthcare industry. Students will be challenged to understand human resource management strategies and the roles of leaders and managers to enable organizational, effectiveness and efficiency and performance excellence.

PREREQUISITES: HESA 5330.03

### **HESA 6341 Management Union Relations: Decisions and Implementation**

CREDIT HOURS: 3

This course provides a comprehensive overview of labor relations in the healthcare system. Real life situations, cases and arbitration decisions will be analyzed and discussed. Issues studied include the certification process, the collective bargaining process, the outcomes of collective bargaining, grievance handling and the disciplinary process in a unionized environment. As well, trends in healthcare labour relations and management's role in maintaining and ensuring effective relations with unions will be addressed.

PREREQUISITES: HESA 5330.03

### **HESA 6345 Healthcare Leadership: Decisions, Ownership and Accountability**

CREDIT HOURS: 3

Effective leadership is foundational to successful organizations, determining not only strategic direction but ultimately determining success and sustainability. The topics to be covered include a) Authentic leadership and decision making; b) Team-based decisions; c) Alignment of Commitment and performance; and d) Leading innovation and organizational effectiveness through strategic decision making. Offered 2017-2018

### **HESA 6360 Healthcare Law**

CREDIT HOURS: 3

This course surveys legal issues relevant to individuals, institutions, and government agencies involved in Canadian healthcare delivery. By the end of the course, students will be familiar with many of the key laws and their associated public policy rationales and will understand how the law applies to healthcare delivery.

FORMATS: Lecture

### **HESA 6361 Business Law in the Healthcare Context**

CREDIT HOURS: 3

This course surveys business law topics relevant to the healthcare context. Students will learn the law related to contracts, business structures, employer-employee relationships, labour relations, human rights, property, debts and security, bankruptcy, and insurance. Students will be able to identify legal risk and apply legal concepts/principles to real case scenarios.

PREREQUISITES: HESA 6360.03

FORMATS: Lab

### **HESA 6362 Advanced Healthcare Law**

CREDIT HOURS: 3

This online seminar-style course builds on the foundational Healthcare Law (HESA 6360) course by offering a more in-depth examination of some of the topics surveyed in that course and exposing students to additional healthcare law topics. Students will be introduced to legal research methodologies and prepare a research paper.

PREREQUISITES: HESA 6360.03

FORMATS: Seminar

### **HESA 6363 Health Law and Policy: Current Issues**

CREDIT HOURS: 3

This course offers an opportunity for students to engage critically with a set of lectures on cutting-edge health law and policy issues presented by distinguished guest speakers from a variety of scholarly disciplines and professional fields related to health law and policy. The lecture topics change from year to year, depending on the speakers and issues selected for presentation. Students are required to attend each lecture and to read material relevant to the given topic in advance of the lecture. Immediately following each lecture, students will attend a tutorial that will be facilitated by the course instructor. The tutorials will involve a roundtable discussion by the students of the lecture content and the reading material that was distributed prior to the lecture.

PREREQUISITES: HESA 6360.03

FORMATS: Seminar

### **HESA 6365 Quality Management in Healthcare**

CREDIT HOURS: 3

Quality Management (QM) provides participants with an understanding of QM concepts and practices in healthcare. The goal is to prepare students to actively contribute to a QM context. The scope ranges from broad topics associated with QM as an organization development strategy to teams, tools, and techniques for effective process improvement projects.

PREREQUISITES: HESA 5315

CROSSLISTED: NURS 5865.03

### **HESA 6366 Health Law and Policy: Current Issues I**

CREDIT HOURS: 1.5

This course offers an opportunity for students to engage critically with a set of lectures on cutting-edge health law and policy issues presented by distinguished guest speakers from a variety of scholarly disciplines and professional fields related to health law and policy. The lecture topics change from year to year, depending on the speakers and issues selected for presentation. Students are required to attend each lecture and to read material relevant to the given topic in advance of the lecture. Immediately following each lecture, students will attend a tutorial that will be facilitated by the course instructor. The tutorials will involve a roundtable discussion by the students of the lecture content and the reading material that was distributed prior to the lecture.

PREREQUISITES: HESA 6360.03

EXCLUSIONS: HESA 6363.03

FORMATS: Lecture | Seminar

### **HESA 6367 Health Law and Policy: Current Issues II**

CREDIT HOURS: 1.5

This course offers an opportunity for students to engage critically with a set of lectures on cutting-edge health law and policy issues presented by distinguished guest speakers from a variety of scholarly disciplines and professional fields related to health law and policy. The lecture topics change from year to year, depending on the speakers and issues selected for presentation. Students are required to attend each lecture and to read material relevant to the given topic in advance of the lecture. Immediately following each lecture, students will attend a tutorial that will be facilitated by the course instructor. The tutorials will involve a roundtable discussion by the students of the lecture content and the reading material that was distributed prior to the lecture.

PREREQUISITES: HESA 6360.03, HESA 6366.03

EXCLUSIONS: HESA 6363.03

FORMATS: Lecture | Seminar

### **HESA 6370 Comparative Healthcare Funding and Insurance Systems**

CREDIT HOURS: 3

This course focuses on the finance and delivery of healthcare in systems across the globe. Students will examine the history, politics, demographics, health issues and related delivery challenges in national health systems. They will study their funding, workforce requirements, programs, facilities, technology, and innovation; health systems are evaluated in terms of costs, quality, and population health outcomes.

### **HESA 6380 Senior Seminar**

CREDIT HOURS: 3

Each class member prepares and presents a major analytical paper on a significant, unresolved healthcare problem related to his/her career aspirations. Practitioners and other interested persons are invited to the paper presentations scheduled during the last weeks of class. Classes focus on debates, interprofessional learning modules, a values exercise, and current issues in healthcare management raised by class members and the instructor. The class provides opportunities to analyze, synthesize and integrate knowledge and values while refining communication and appraisal skills. Senior Seminar is normally completed in the last term of the MHA program.

### **HESA 6390 Health Administration Residency**

CREDIT HOURS: 6

A 16-week full time administrative residency is required for all students in the Master of Health Administration program. The objective of the residency is to provide first-hand familiarity with administrative problems and operations of a healthcare organization. Students are mentored by qualified, practicing senior health administrators. They apply and test administrative theories and concepts in a practical setting, and acquire administrative skills, knowledge, and perspectives through observation and contact with a diversity of programs and managers. Residency guidelines and information will be available to students in September of their first year.

CALENDAR NOTES: Residencies are required for all students. However, due to enrollment levels, not all placements may be available in the Halifax area.

### **HESA 6394 Directed Project**

CREDIT HOURS: 3

In order to obtain credit, students are required to complete a written report based upon research in, or exposure to, a defined problem in health administration. For some students, this will involve research within a health agency or government department. It may be based upon the consideration of a problem which they have encountered during their actual employment or residency. In both cases, the design of the project and the preparation of the report will be done under the supervision of a member of the faculty.

### **HESA 6395 Directed Reading**

CREDIT HOURS: 3

A special program of directed reading, with appropriate written assignments, may be arranged with a member of the faculty where the interest in a subject is not sufficiently widespread to warrant offering a regular course.

### **HESA 6400 Executive Decisions: Dynamics of Bias, Risk and Persuasion**



CREDIT HOURS: 3

Powerful psychological constructs affect decision making. The course will focus on a) recognizing the psychological constructs that can profoundly affect the decision-making process and the decision rendered; b) formulating strategies to effectively manage the potential influence of these psychological constructs; c) formulating strategies to influence and communicate decisions. Offered 2017-2018

### **HESA 6505 Statistics for Health Administration**

CREDIT HOURS: 3

This course provides graduate student in health administration with the skills to understand and carry out statistical analyses in their field. Computer labs using Excel form an integral part of the course. The course covers data acquisition and presentation, fundamentals of probability, distributions, inference, analysis of variance, and regression models.

EXCLUSIONS: STAT 5990, HESA 6500

### **HESA 9000 Thesis**

CREDIT HOURS: 6

### **HESA 9001 Thesis Continuation**

CREDIT HOURS: 6

## **Health**

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Website: [www.dal.ca/faculty/health.html](http://www.dal.ca/faculty/health.html)

## **PhD in Health**

### **PhD in Health**

Dalhousie University is home to the largest collection of educational programs related to health and social well-being in Canada.

Graduates of the PhD in Health are on the right track to successful careers as researchers, academics, and leaders in health - working to improve health and social well-being locally, nationally, and internationally.

### **Program Objectives**

- To graduate high quality, independent researchers, academics, and leaders who can lead research and research teams influencing and directing health outcomes, health promotion, health care delivery and services, and social well-being by facilitating acquisition of the research skills needed to succeed in the current and evolving health research context.
- To expose future health leaders to the methodological and practical research issues in the broader health research context and to prepare them to function effectively on interdisciplinary/interprofessional teams working at a variety of organizational levels and in a variety of environments.
- To prepare researchers to disseminate and promote their particular research focus to policy makers which will then inform practices, programs, and policies to the general public.

# Staff

## Graduate Coordinator

**Boe, S.** BPhEd, MPT, PhD

## Professors

**Agu, R.**, BPharm, MPharm (Univ Nigeria), MPharm, PhD (Katholieke Universiteit, Belgium). Drug delivery, Toxicity screening, Transporters, Respiratory-Nasal

**Beagan, B.**, BA, MA (Dalhousie), PhD (UBC). Social Class, Professional Practice, Sexual and Gender Identity, Diversity Inclusion, Health Professional Education, Disability, Social Inequality and Occupation, Race Ethnicity and Racism

**Blanchard, C.**, BA Honours (UPEI), MSc, PhD (Alberta), major appointment in the Department of Medicine. Determinants of health behaviours (mainly physical activity) in diseased (e.g., cardiac patients and cancer survivors) and non-diseased (e.g., adolescents, university students, adults, ethnic disparities) populations; quality of life outcomes associated with health behaviours in diseased and non-diseased populations; statistics, research methods, and measurement.

**Campbell-Yeo, M.**, BN, MN (Dalhousie), PhD (McGill), RN. Clinical trials examining the impact of family and novel interventions on infant outcomes, pain stress, skin-to-skin contact, co-bedding. Clinical trials examining the impact of family and novel interventions on infant outcomes, pain stress, skin-to-skin contact, co-bedding

**Curran, J.**, BScN, MEd (Memorial), PhD (Dalhousie), RN

**Gahagan, J.**, BA, BA Honours (Carleton), MA (Univ of Windsor), PhD (Wayne State Univ). End of life care, Gender and health, Sexual health, Social determinants of health, Harm reduction

**Goralski, K.**, BSc, PhD (Manitoba). Pharmacokinetics, Breast Cancer, Chemerin and Chemokine-Like Receptor 1 (CMKRL 1), Adipose (Fat) Tissue and Adipokines, Pharmacology, Obesity, Jadomycins

**Hubley-Kozey, C.**, BPE (UNB), MSc (Waterloo), PhD (Dalhousie). Muscle activation and movement, Low back pain, Interrelationship of muscles in normal and pathological conditions, Knee joint pathologies, Osteoarthritis

**Jackson, L.**, BA, MA, PhD (Toronto). Harm reduction, Rural women's health, Marginalized populations, Sex industry

**Jakeman, D.**, BSc, PhD (Sheffield). Chemical biology, Medicinal chemistry, Protein engineering, Natural products, Carbohydrates

**Johnston, G.**, BSc (McGill), MHSA (Alberta), PhD (Western Ontario)

**Karabanow, J.**, BA (Hons), MA (McGill), PhD (Wilfrid Laurier). International social work, Organization theory, Globalization, Housing, Political economics, Homelessness, and Poverty

**Kay-Raining Bird, E.**, BA, MSc, PhD (Wisconsin), Cultural and linguistic diversity, Down Syndrome, Language assessment and intervention, Autism, Child language development and disorders, Bilingualism

**Keats, M.**, BA (Calgary), MA (Alberta), PhD (Calgary). Physical activity, Exercise and cancer, Health promotion, Young adult cancer

**Kieft, M.**, BA, MSc, PhD (Alberta). Speech processing, Speech perception and production

**Kirk, S.**, BSc Honours (Leeds Metropolitan Univ), PhD (Univ of Leeds). Health intervention, Physical activity, Health promotion, Obesity

**Latimer, M.**, BA (MAU), BScN, MN (Dalhousie), PhD (McGill), RN, Women's Health, Feminist counselling

**MacDonald, J.**, BSW (STU), MSW (Carleton), PhD (Memorial). Anti-oppressive practice, Disability,

**MacKay-Lyons, M.**, BSc (PT) (Toronto), MScPT (USC), PhD (Dalhousie) Neurotherapeutics

**Packer, T.**, BSc (OT) (Western) MSc, PhD (Queen's). Participation, Self-Management, Disability, Chronic conditions, Health Education

**Rehman, L.**, BHK, MA (UBC), PhD (Waterloo). Work relationships and health, Access to recreation, Youth and leisure, Children and leisure, Leisure, and the Internet

**Singleton, J.**, BA (Waterloo), MS (Penn State), PhD (Maryland). Therapeutic recreation, Social gerontology, Leisure research, Leisure and aging

**Shaw, L. E.**, BSc (OT), MSc (OT), PhD (Western). Occupational transitions, hearing in the workplace, return to work and employment disparities, and chronic pain

**Sketris, I.**, BSc (Pharm) (Toronto), PharmD (Minn), MPA (HSA) (Dalhousie). Pharmacy practice, Drug safety, Pharmacoepidemiology, Pharmaceutical policy

**Steenbeek, A.**, BScN, MScN, PhD (UBC), RN. Aboriginal health, Sexually transmitted infections, Community-based research, Health services among marginalized populations

**Ungar, M.**, BA, BSW, MSW (McGill), PhD (Wilfrid Laurier). Social constructionism, Cross-cultural diversity research, Family therapy, Child and adolescent mental health, Delinquency, Program evaluation, Child development, Ecological social work, Resilience

**Wang, J.**, BS, MA, PhD (SUNY). Instrumentation in audiology, Hearing Science, Neuroscience

**Warner, G.**, PhD (Epidemiology) (Case West Reserve Univ). Home Based Rehabilitation, Health Services Research, Aging, Participation, Mixed Methods, Implementation Science, Self-Management, Family Centred Care

**Weeks, L.**, BSc (UPEI), MSc (Maine), PhD (Virginia Tech). Rural issues, Care transitions, Senior housing, End of life care, Gender and

aging, Aging, Elder abuse, Family caregivers

**Weinberg, M.,** BA (Toronto), MSW (Smith College), PhD (Toronto). Gender, Difference and identity, Discourse analysis, Qualitative research, Ethics in the helping professions, Critical post-structural feminist theory

**Westwood, D.,** BSc, MA, PhD (Waterloo). Movement disorders, Cognitive neuroscience, Kinesiology, Physiology, Motor control

**Yeung, P.,** BSc (Pharm), MSc (Man), PhD (Saskatchewan). Pharmacokinetics, Bioanalysis, Pharmacodynamics, Biomarkers, Drug metabolism

## Associate Professors

**Aiken, S.,** BA, MSc, PhD (Toronto), Binaural processing, Hearing aid processing, Cortical event related potentials, Electrophysiology, Auditory temporal processing, Speech evoked responses, Auditory steady-state responses

**Boe, S.,** BPhEd (Brock), MPT, PhD (Western). Central and peripheral nervous system adaptations, Neurorehabilitation, Cortical contributions to balance control

**Bombay, A.,** BSc (Ottawa), MSc, PhD (Carleton). Aboriginal health and wellbeing, mental health, cultural identity, stress and trauma, intergenerational transmission, Indian Residential Schools, historical trauma, discrimination, and intergroup relations, quantitative and/or qualitative methodologies

**Brown C.,** BA, MA (Manitoba), MSW (Carleton), PhD (Toronto). Feminist research, Cross-cultural diversity research, Depression, Sexual abuse, violence against women and children, Women's Health, Health and Mental Health Policy, eating disorders and body image, Childhood trauma, Addictions

**Cleave, P.,** BA/BSW, MCISc, PhD (Kansas). Language and literacy skills of children with language impairment and Down Syndrome

**Goldberg, L.,** BA (CBU), MA (Dalhousie), PhD (Alberta), RN. Perinatal nursing, feminist phenomenology, queer women's health, and nursing philosophy

**Grandy, S.,** BSc, MSc, PhD (Dalhousie). Cardiac function and aging, Cardiac cellular function, Cardiac disease prevention, Exercise, and cardiac disease

**Hajizadeh, M.,** BA, MSc (Iran), PhD (Australia), Healthcare financing and utilization, equity in healthcare, health inequality and inequity, health policy, health economic evaluation

**Hickey, E.,** BS, MA, PhD (Washington). Global health, Aphasia, Quality of life, Communication activities and participation, Treatment efficacy outcomes, Dementia, Traumatic brain injury

**Hutchinson, S.,** BA (Victoria), MA (Dalhousie), PhD (Georgia). Leisure education; leisure and health promotion/risk prevention; leisure-based responses to stress; theory-driven program design and evaluation

**Ingles, J.,** BA, PhD (Dalhousie). Language and cognition in adults with neurological disorders

**Kiepek, N.,** BSc (Toronto), MSc (Toronto), PhD (Western University)

**Kimmerly, D.,** BSc (Hons) (Waterloo), MSc, PhD (UWO). Cardiovascular disease and exercise, Cardiac function, Exercise physiology, Nervous system, and exercise

**Kozey, J.,** BSc, MSc (Waterloo), PhD (TUNS). Clinical and occupational biomechanics, Ergonomics, Biomechanics and psychophysics, Accessibility, Workstation design, Anthropometry

**MacKenzie, D.,** BSc (Saskatchewan), BSc (OT) (Alberta), MA (Ed) (MSVU), PhD (Dalhousie). Observation and eye movement, Neurological rehabilitation, and interprofessional education

**Mah, C.,** MD (Calgary), FRCPC (Royal College of Physicians and Surgeons of Canada), PhD (Toronto)

**Martin, D.,** BRec (Memorial), MA, PhD (Dalhousie). Food justice, Social determinants of health, Community based participatory research, Oral health promotion, Aboriginal-Indigenous health

**Merritt, B.,** BS, MS (OT), PhD (Colorado State). Curriculum Evaluation, Health Professional Education, HIV, Objective Measurement, Chronic conditions, Rehabilitation, Activities of daily living

**Neyedli, H.,** BSc (Dalhousie), MSc (Toronto), PhD (Toronto), Post Doc (University of Oxford)

**Numer, M.,** BA (Robert Morris Univ), MEd (California Univ), PhD (Dalhousie). Gay men's health, LGBTQ Health, HIV/AIDS, technology in post-secondary education, poststructural theories, queer theory, critical qualitative methodologies, discourse analysis

**Persaud, D.,** MSc (Queen's), MSA (Cntrl Mich), PhD (Toronto). Multi-disciplinary health care teams, Organizational learning adaptation and innovation, Performance management and measurement, Change management

**Robinson, L.,** BSc Honours 1st. class (UVIC), MA, PhD (Simon Fraser). Cancer patients, Stress and social support, Stress and coping, Child and adolescent mental health, Information technology as a source of support information for health, Psychosocial aspects of cancer, Adolescent mental health, Relationships, and health

**Sabo, B.,** BA (Manitoba), MA, PhD (Dalhousie), RN. Knowledge to Action, Palliative care, Psychosocial oncology, Oncology

**Truong, S.,** BSc (Dalhousie), MA (Alberta), PhD (Alberta)

**Versnel, J.,** BSc (OT) (Toronto), MSc (OT) (Western), PhD (Queen's). Children Youth Young Adults and Families, Chronic disease, Evidence Based Practice, Participation, Interprofessional Practice, Transition to Adulthood, Self-Management, Chronic conditions, Knowledge Translation

**Waldron, I.,** BA (McGill), MA (London), PhD (Toronto). Impact of inequality on the health and mental health of racially diverse communities

## Assistant Professors

**Dechman, G.**, BScPT (Queen's), PhD (McGill). Outcome measures to assess changes in activities for individuals with disabilities, Exercise to improve function for those with chronic diseases

**Dieleman, C.**, BSc (OT) (Western), MSc, PhD (Queen's). Qualitative Research Methods, Diversity Inclusion, Professional Practice, Policy Implementation, Community Capacity Mapping Building, Mental Health, Forensic Correctional Services

**Dithurbide, L.**, BA (St. Mary's), MA (Brock), PhD (Michigan State)

**Fenety, A.**, BSc (UNB), DPT (Manitoba), MSc (Alta), PhD (Dalhousie). Workplace modifications to prevent injury, Workplace injury

**Gallant, K.**, BSc (Hons) (Mt. A), BJourn (King's), MSc (Guelph), PhD (Waterloo). Volunteerism and organizational participation and their implications for communities; feelings of obligation within volunteering; civic engagement and community development; inclusion of marginalized populations in communities.

**Ghanouni, P.**, BSc (SBUMS) MSc (SBUMS), PhD (UBC)

**Hamilton-Hinch, B.**, BSc (Dalhousie), MA (Dalhousie), BEd (MSVU), PhD (Dalhousie)

**Ladouceur, M.**, BSc, MSc (Sherbrooke), PhD (McGill). Spinal cord injury, Rehabilitation, Spasticity management, Physiology, Sport

**Lauckner, H.**, BSc (OT), MSc, PhD (Queen's). Diversity Inclusion, Community Engagement, Collaborative Community Practice, Collective Occupations, Community Development

**Rutherford, D.**, BSc (UWO), BSc PT (Toronto), MSc, PhD (Dalhousie). Knee osteoarthritis, Lower extremity injury and disease, Quantifying mechanics, and muscle activation, Neuromusculoskeletal therapeutics

**Welch, J.**, BA, BSc Honours (Carleton), MSc (Alberta), PhD (Purdue Univ). Bones and nutrition, Obesity remediation, Bone imaging, Health benefits of sports, Bones, and exercise

## Admissions

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. In addition to these, the program has the following requirements:

Students will be accepted into the PhD program only after completion of a Master's degree from an accredited program. Applicants who have completed a research (thesis-based) Master's will be eligible for the two-year residency PhD program and those who have completed a non-thesis Master's program are eligible for the three-year residency PhD program. Enrollment must be on a full-time basis and there is no distance learning option.

Additional admission requirements:

- Cumulative GPA of 3.7 based on both undergraduate and graduate transcripts.
- Commitment of a supervisor or co-supervisors.
- An approved plan of funding which covers a minimum of \$12,000 plus tuition and fees per year for the duration of the student's program. Normally, students who are accepted are supported financially by external or Dalhousie scholarships, supervisors research funding or a combination of both.
- For International applicants, an English Language Competency score of TOEFL >100 (Internet) or IELTS 7.5 and funding plan must also include International Differential Fees.

Application deadline: January 31

## Degree Requirements

The PhD in Health is offered as a two-year residency program for students who have completed a thesis-based Masters and a three-year residency program for students with a non-thesis-based Masters. Students in the three-year program will complete research experience courses and a small-scale research/pilot project in their first year. These must be completed before the student pursues the regular HLTH 6100 program requirement. Students must be registered in the program on a full-time basis.

Please note that the terms **two-year** and **three-year** refer to the amount of time a full-time student is expected to take to complete required coursework and comprehensive exams. It is generally expected that research and dissertation completion will take approximately two additional years.

## Two-Year Program Requirements

- HLTH 6000.03 - Graduate Seminar (3 credit hours)
- HLTH 6100.03 - Fundamental, Applied, and Translational Aspects of Health Research (3 credit hours)
- one advanced research elective (3 credit hours)
- two additional graduate level electives (6 credit hours)

- HLTH 8000 - Comprehensive Exam
- HLTH 9530 - Doctoral Thesis

### Three-Year Program Requirements

- HLTH 5101.03 - Research Project I (3 credit hours)
- HLTH 5102.03 - Research Project II (3 credit hours)
- HLTH 6000 - Graduate Seminar (3 credit hours)
- HLTH 6100 - Fundamental, Applied, and Translational Aspects of Health Research (3 credit hours)
- two advanced research electives (6 credit hours)
- two additional graduate level electives (6 credit hours)
- HLTH 8000 - Comprehensive Exam
- HLTH 9530 - Doctoral Thesis

### Additional Requirements

- present at a local or other scholarly conference at least once.
- produce 2 peer-reviewed publications.
- apply for at least one funding/scholarship award either prior to or during their program

### Supervisory Committees

Each student will have a supervisory committee consisting of their thesis supervisor(s) plus at least two faculty members appointed to the Faculty of Graduate Studies. The supervising committee will meet at least twice a year or when called by any member of this committee or the student.

## Graduate Certificate in Mental Health and Addictions

### Graduate Certificate in Mental Health and Addictions

The Graduate Certificate in Mental Health and Addictions (GCMHA) is an interdisciplinary program administered by the School of Social Work. The certificate was developed to provide working professionals with the latest knowledge, skills and attitudes required to improve the lives of persons affected by mental health and addictions challenges. These courses are fully online; however, they are centered around a team-based approach to learning and encourage discussion and interaction with instructor and classmates. Assignments are focused on helping students apply knowledge to real-world situations they encounter in their working life.

#### Program Coordinator:

Judy MacDonald BSW (STU), MSW (Carleton), PhD (Memorial)

#### Location and Contact:

1459 LeMarchant Street, Suite 3201  
 Halifax, NS B3H 4R2  
 Telephone: (902) 494-3760  
 Fax: (902) 494-6709  
 Email: [mha@dal.ca](mailto:mha@dal.ca)  
 Website: [dal.ca/health/mha](http://dal.ca/health/mha)

#### Courses

The four courses that make up the certificate build on students' current knowledge of mental health and addictions by studying the MH&A system and its participants in depth: looking at the current systems in place and thinking critically about their impact on the health and well-being of individuals, families and communities. The four courses are:

- HLTH 5110.03: Mental Health and Addictions Services and Systems

- HLTH 5120.03: Mental Health, Substance Use and Addiction Across Health Practices: Working with Persons, Families and Communities
- HLTH 5130.03: Concurrent Disorders and Complex Case Work: Working with Persons, Families and Communities
- HLTH 5140.03: Prevention, Early Intervention and Population Focused Health Promotion

For full course descriptions, see Course Descriptions section.

### Admission Requirements

All applicants to the GCMHA must meet the Faculty of Graduate Studies minimum admission requirements as outlined in the Faculty of Graduate Studies Academic Calendar.

Applicants must have a four-year Bachelor degree, granted by a university of recognized standing, and a minimum grade point average (GPA) of 3.0 (B average) in the last 60 credit hours of undergraduate study. Graduate level credits are not used in the admission average.

In addition, applicants must have completed -- at a minimum -- an undergraduate degree program in one of the following fields or equivalent:

- Nursing
- Social Work
- Occupational Therapy
- Recreation Therapy
- Pharmacy
- Health Promotion
- Clinical Psychology
- Medicine

Those with four-year Bachelor degrees in other programs (e.g., Education, Law) are also welcomed to apply but are required to provide detail in their cover letter and resumé explaining how their education and work experience relate to the area of mental health and addictions, and how pursuing this certificate would support their work in this field.

Dalhousie students who are completing a Dalhousie graduate program in Nursing, Social Work, Occupational Therapy, Clinical Psychology, Medicine, Recreation Therapy, Pharmacy, and Health Promotion are eligible to apply for the GCMHA and must meet the admission requirements stated above. In some cases, current Dalhousie graduate students may also take GCMHA courses as electives. Please consult with the department for more details.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### HLTH 5101 Research Project I

CREDIT HOURS: 3

Students will undertake a small-scale research project. Students will complete a comprehensive literature review, identify the research question, and write a proposal. This will be completed by the end of the 2nd term. Upon completion, student will enroll in HLTH 5102 in which the student will conduct the study.

### HLTH 6000 Health Seminar Series I

CREDIT HOURS: 3

This seminar will expose students to the range of methods and issues in health research and increase their understanding of the potential contributions made by diverse interpretations, methods, and disciplines. It consists of students and invited guest's presentations. Seminars will help students develop the ability to present in an academic/professional setting.

CALENDAR NOTES: HLTH 6000.03 is a 3-unit (half) elective credit course encompassing the Fall and Winter terms; students taking this class must register and complete both the Fall and Winter terms consecutively in their first year of the PhD in Health Program.

### **HLTH 6100 Fundamental, Applied and Translational Aspects of Health Research**

CREDIT HOURS: 3

The objective of this course is to expose students to current/critical topics in Health research. The course will consist of invited research/clinical/administrative/policy presentations related to the latest findings in health. These seminars will provide knowledge in the basic and applied aspects of health research that spans a number of disciplines/professions.

CALENDAR NOTES: HLTH 6100 is a 3-unit (half) credit course encompassing the fall and winter terms; students taking this class must register and complete both the fall and winter terms consecutively in their first year of the PhD in Health program to receive course credit.

### **HLTH 7001 Directed Study I**

CREDIT HOURS: 3

Individual students work with a designated faculty member to conduct an in depth examination of a specific topic. The content, resources, and evaluation methods are customized to address a learning issue that relates to the student's research interests. The Independent Study HLTH 7001 is independent of Independent Study HLTH 7002.

### **HLTH 8000 Comprehensive Examination**

CREDIT HOURS: 0

Following completion of all course work, students will register in the Comprehensive Examination course while they prepare for and until they have passed the Comprehensive Examination.

PREREQUISITES: Completion of course requirements

### **HLTH 9530 Doctoral Thesis**

CREDIT HOURS: 0

## **Health and Human Performance**

Location:

Stairs House

6230 South Street

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2152

Fax Number: (902) 494-5120

Email Address: [hahp@dal.ca](mailto:hahp@dal.ca)

Website: [www.dal.ca/hahp](http://www.dal.ca/hahp)

## **Introduction**

The School's mission is to develop professionals and scholars who can generate, disseminate, and apply knowledge to advance health and human performance.

We do this by offering undergraduate and graduate programs as well as by conducting research in health promotion, kinesiology, and recreation/leisure studies.

The School of Health and Human Performance offers master's degree programs in three areas: Master of Arts in Health Promotion, Master of Science in Kinesiology and Master of Arts in Leisure Studies. There are ongoing research programs in each of the areas of health promotion (basic health-related research and evaluation of health education/health promotion policies, programs, practices and content), kinesiology (exercise physiology, neuromuscular physiology, ergonomics, motor performance, bone and nutrition, physical fitness across the lifespan, health and exercise psychology, biomechanics and sport psychology) and leisure studies (leisure and social groups such as older adults, youth or persons with health problems/disabilities; historical analysis of leisure and sport; analysis of sport and recreation administration and cultural services).

For more detailed information on the regulations regarding these programs, students are invited to visit our Website at <http://www.dal.ca/hahp>

## Staff

### Director

**Rehman, L. A.**, BHK, MA (UBC), PhD (Waterloo)

### Professors

**Gahagan, J.**, BA (Hons) (Carleton), MA (Windsor), PhD (Wayne State). HIV/AIDS prevention, care, treatment, and support issues; sexual and reproductive health; access to health care resources among socially marginalized populations; HIV testing and counseling among pregnant women in Canada.

**Jackson, L. A.**, BA, MA, PhD (Toronto). The social determinants of health among vulnerable populations (e.g., youth, women in the sex trade); rural health; HIV/AIDS; addictions and harm reduction; and qualitative methods.

**Keats, M.**, BA (Calgary), MA (Alberta), PhD (Calgary). Health and exercise psychology. Research goals are to advance the scientific understanding of the interrelationships amongst the biopsychosocial aspects of physical activity and cancer. Research activities include: the examination of the impact of physical activity on cancer control outcomes such as prevention, coping, rehabilitation, health promotion, palliation, and survival; investigating the behavioural determinants of physical activity; and exploring the effectiveness of interventions designed to promote physical activity across the cancer continuum.

**Kirk, S.**, BSc (Hons), PhD (Univ of Leeds). Health services, health promotion, health intervention, obesity, physical activity.

**Rehman, L. A.**, BHK, MA (UBC), PhD (Waterloo). Leisure and entrepreneurship; leisure and work life balance; leisure and access by marginalized groups; physical activity and leisure.

**Westwood, D. A.**, BSc, MA, PhD (Waterloo). Neuroscience, cognitive psychology, motor control. Basic research in the visual control of movement using 3D motion analysis, eye-tracking, and functional brain imaging. Applied motor control research in altered thermal environments, psychiatric disorders, and stroke.

### Associate Professors

**Grandy, S.**, BSc, MSc, PhD (Dalhousie). The effects of age-related alterations in inflammation and oxidative stress on cardiac function (e.g., cardiac contraction and repolarization); and protective effects of physical activity during the aging process.

**Hutchinson, S. L.**, BA (Victoria), MA (Dalhousie), PhD (Georgia). Leisure education; leisure and health promotion/risk prevention; leisure-based responses to stress; theory-driven program design and evaluation.

**Kimmerly, D.**, BSc (Waterloo), MSc, PhD (Western Ontario). Human Cardiovascular Neuroscience and Exercise Physiology. Our research is focused on the interaction between the autonomic nervous system and cardiovascular function. We are currently using functional brain imaging and microneurography techniques to identify the brain regions involved with autonomic cardiovascular control. Studies are also conducted that characterize the effect that acute (e.g., single bout) and chronic (e.g., training) exercise has on these systems.

**Kozey, J. W.**, BSc, MSc (Waterloo), PhD (TUNS). Clinical and Occupational Biomechanics and Physical Ergonomics. Research activities include biomechanical analysis of manual materials handling tasks, 3-D reach measurement and modeling, workstation design, personal protective equipment design and factors related to emergency helicopter egress.

**Martin, D.**, BRec (Memorial), MA, PhD (Dalhousie). Aboriginal peoples' health and well-being; Indigenous and qualitative methodologies; community-based participatory research methods; Interconnections between food, culture, and health; health and environmental policies as they relate to Aboriginal communities.

**Neyedli, H. F.**, BSc Hon (Dalhousie), MASc, PhD (Toronto). Motor control, cognitive ergonomics, neuroscience. Basic research on attention, motor control and decision making using statistical decision theory and human motion analysis. Applied work on human-technology interaction in areas such as stroke rehabilitation and military combat identification.



**Numer, M.,** BA (Robert Morris Univ), MEd (California Univ), PhD (Dalhousie). Gay men's health, LGBTQ Health, HIV/AIDS, technology in post-secondary education, post structural theories, queer theory, critical qualitative methodologies, discourse analysis.

**Rainham, D.,** BES (Waterloo), MSc (Alberta), PhD (Ottawa). Environmental epidemiology; health geography; children's environmental health; exposure assessment; geographic information systems; health benefits of nature contact; sustainability; carbon emissions and health care.

**Robinson, L. M.,** BSc (Hons) (UVic), MA, PhD (Simon Fraser). Psychosocial Oncology, especially adolescent and youth and workplace issues. Mental health, especially for youth.

**Truong, S.,** BSc (Dalhousie), MA (Alberta), Postgrad Cert. International Development & Refugee Studies (East London), PhD (Alberta), CTRS, RYT. Children's play, wellbeing, and environments; therapeutic recreation; outdoor and experiential learning; place-based pedagogies; contemporary childhoods; participatory and action research; visual methods.

## Assistant Professors

**Dithurbide, L.,** BA (St. Mary's), MA (Brock), PhD (Michigan State). Research focuses on the psychosocial aspects of sport and physical activity; the long-term goal is to better understand the antecedents and outcomes of team and teammate trust. The results of this research will be useful in helping athletes, coaches, organizational leaders, health service providers with the best ways to help increase the performance, and well-being of their respective groups and teams.

**Frayne, R. J.,** BSc (Hons) (Guelph Uni.), MSc, PhD (UWO). Personal protective equipment, sport safety and performance.

**Gallant, K.,** BSc (Hons) (Mt. A), BJourn (King's), MSc (Guelph), PhD (Waterloo). Volunteerism and organizational participation and their implications for communities; feelings of obligation within volunteering; civic engagement and community development; inclusion of marginalized populations in communities.

**Hamilton-Hinch, B.,** BSc, MA, PhD (Dalhousie). Marginalized populations including persons with disabilities, Aboriginal, low income, and LGBTQ.

**Ladouceur, M.,** BSc, MSc (Sherbrooke), PhD (McGill). Normal and pathological gait from the perspective of neuromuscular control and biomechanics.

**Moore, S.,** BRLS (Hon), MSc (Brock), PhD (UBC). Promoting physical activity across the lifespan, adapted physical activity for persons with disabilities and chronic conditions, pediatric physical activity and exercise, engaging children in sport and recreation, therapeutic and inclusive recreation, engaging children in outdoor and risky play, dignity of risk for children with disabilities and chronic conditions, relationship between physical activity and health, enhancing musculoskeletal health and reducing injury, healthy childhood growth, development, and maturation.

**Stone, M.,** BPHE, BSc (Queen's), MSc (Saskatchewan), PhD (Exeter). Physical activity measurement; profiling physical activity and sedentary behaviour and examining relationships with physiological health outcome; built environment, physical activity, and health; independent mobility, physical activity, and active transport in children; interventions to promote physical activity and reduce sitting time; community health, population health, health promotion and chronic disease prevention.

**Welch, J.,** BA, BSc Honours (Carleton), MSc (Alberta) PhD (Purdue Univ). Research interests include the effects of exercise and nutrition on bone adaption across the lifespan; nutrition and health; effects of Vitamin D on health in a variety of populations; and the role of Vitamin D in disease mitigation.

## Instructors

**Spencer, B.,** BSc, MA, PhD (Dalhousie). Gender and health, Ecological and comprehensive approaches, Systems and structural influences on health, Physical activity, and nutrition.

**Woodford, K.,** BA, BRec (Memorial), MA (MSVU), CTRS. Therapeutic Recreation; mental health and addictions (child, youth, adult); wilderness therapy, distance programming, and experiential learning.

**Zahavich, J.,** BSc (Dalhousie), MSc (Calgary), PhD (Dalhousie). School health promotion as it relates to physical literacy and physical education. Exercise testing and prescription for healthy and clinical populations. Coach science with a focus on endurance sport. Health technology and wearables, entrepreneurship, and business development. Qualitative and quantitative research methods.

## Cross-listed FGS Members

**Aston, Megan.**

**Bardouille, Tim.**

**Blanchard, Christopher.**

**Boe, Shaun.**

**Dechman, Gail.**

**Kiepek, Niki.**

**Klein, Raymond.**

**Manning, Eli.**

**Orji, Rita.**

**Perrot, Tara.**

**Waldron, Ingrid.**

## **Adjunct (FGS) Member**

Ramos, H, BA, PhD (McGill).

# **Admission Requirements**

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

Students seeking admission to any of the master's programs should have earned an excellent record during four years of undergraduate study. Candidates for the Master of Science in Kinesiology must have an honours or honours equivalent degree which includes the completion of an independent research project. Candidates for the Master of Arts in Health Promotion must have a sufficient background in health promotion with at least 24 credit hours in health promotion or health-related courses. Candidates for the Master of Arts in Leisure Studies must have a sufficient background in recreation, leisure studies, or a related field. An honours or honours equivalent degree is recommended for candidates for the Master of Arts in Health Promotion or Leisure Studies. Although Dalhousie's minimum GPA requirement is a 3.0 GPA (B), the School of Health and Human Performance requires a 3.5.

Qualifying work may be required of applicants whose background for advanced studies in Health Promotion, Kinesiology, or Leisure Studies is judged deficient.

**The application deadline is January 15, however applications received as late as June 1 will be considered pending space availability.**

## **General Program Requirements**

Please refer to each program area section for specific requirements.

Students may take a maximum of six credit hours of ancillary courses above and beyond the required program of study.

Elective courses can be taken from within or outside the School. All courses must be approved by the student's advisor/Graduate Coordinator.

The thesis topic will be determined by the student in consultation with the thesis supervisor. A thesis proposal must be approved by the candidate's thesis supervisory committee, which consists of at least three members (at least two of whom are members of the School's graduate faculty), before the thesis research may be undertaken.

Once the proposal has been approved by the thesis supervisory committee, it shall be submitted to either the Health Sciences Human Research Ethics Board or the Social Sciences and Humanities Research Ethics Board for consideration. Only after approval has been received from both the thesis supervisory committee and the ethics committee, may the student proceed with data collection.

The thesis examination committee is responsible for approving the completed thesis after a final oral presentation by the student covering the nature and findings of the research. This committee is made up of the supervisory committee plus an external examiner approved by the Graduate Coordinator.

The School holds research-oriented seminars during the academic year. Students are expected to attend and participate in these seminars as discussants and presenters.

## **Equitable Admissions Policy**

The School of Health and Human Performance has an Equitable Admissions Policy intended to create opportunities to increase the support, admission, and graduation of students who self-identify as belonging to historically underrepresented groups: Persons of Aboriginal/Indigenous ancestry (especially Mi'kmaq), members of racialized groups, persons of African descent (especially African Nova Scotians), Acadians, persons with (dis)Abilities, and persons belonging to minority sexual orientation and/or gender identity (SOGI) groups. We encourage applicants to self-identify and indicate which of the target groups applies to them on the Additional Information Form (Note: self-identification is optional).

# **Master of Arts (MA) in Health Promotion**

## ***Program Requirements***

One full academic year (12 months) of resident study at Dalhousie University is a minimum requirement for the one-year master's degree. Although the MA degree program officially has a one-year residency requirement, students should expect to take from 18-

24 months of full-time work to complete the degree. For full-time students, the degree must be completed within four years of first registration.

Completion of the degree is also possible through part-time study. However, financial assistance is not available for students undertaking the degree on a part-time basis.

The MA Health Promotion program consists of - 18 credit hours of courses and a thesis (equivalent to 12 credit hours). Required and elective courses are listed below. Each course is normally worth three credit hours. Electives may be chosen from the lists of courses listed in the Course Descriptions section, or from graduate courses offered by other departments at Dalhousie University, or, to a limited extent, at other universities.

### ***Required Courses***

- HPRO 5501.03: Advanced Research Methods in the Social and Natural Sciences OR comparable course approved by the thesis advisor.
- HPRO 5503.03: Intermediate Statistics for Health Sciences, Prerequisite: Before entering HPRO 5503.03, students must have completed an introductory course in statistics with at least a “B” grade.
- HPRO 5514.03: Current Frameworks in Health Promotion OR HPRO 5516.03: Theoretical and Scientific Bases of Health Promotion
- HPRO 5595.03: Program Planning and Evaluation in Health Promotion
- HPRO 9000.00: Thesis (considered equivalent to 12 credit hours)

### ***Elective Courses***

- HPRO 5514.03 and HPRO 5516.03 as listed above.
- HPRO 5518.03: Women’s Health and the Environment
- HPRO 5600.06/HPRO 5601.03/HPRO 5602.03: Independent Studies. Open to independent completion of study. Interested students should consult the Graduate Coordinator prior to registering in the course.
- HPRO 5620.03: Topics in Biopsychosocial Health. Cross-listed with PSYO 6809.03.
- NURS 5100.03: Qualitative Research Methods

PLEASE NOTE: Not all courses listed below are offered every year. Please consult the timetable for a current list of courses offered.

## **Master of Science (MSc) in Kinesiology**

### ***Program Requirements***

One full academic year (12 months) of resident study at Dalhousie University is a minimum requirement for the one-year master's degree. Although the MSc degree program officially has a one-year residency requirement, students should expect to take from 18-24 months of full-time work to complete the degree. For full-time students, the degree must be completed within four years of first registration.

Completion of the degree is also possible through part-time study. However, financial assistance is not available for students undertaking the degree on a part-time basis.

Students in the MSc Kinesiology program must complete a minimum of 12 credit hours of coursework, a mandatory graduate seminar series worth 3 credit hours, and a thesis (equivalent to 12 credit hours).

### ***Required courses***

- Two of:
  - KINE 5501.03 (or equivalent): Advanced Research Methods in Social or Natural Sciences
  - KINE 5503.03 (or equivalent): Intermediate Statistics for Health Sciences
  - KINE 5590.03 (or equivalent): Measurement and Instrumentation
- KINE 6000.03: Graduate Seminar in Kinesiology (three credit hours)
- KINE 9000.00: Thesis (considered equivalent to 12 credit hours)

### *Elective courses*

- One, three credit-hour graduate course must be selected from the Kinesiology offerings.
- The remaining elective course or courses can be chosen from the graduate offerings within or outside of the School of Health and Human Performance. Elective courses must be relevant to the student's degree program and are to be determined in consultation with the Supervisor.

PLEASE NOTE: Not all courses listed below are offered every year. Please consult the timetable for a current list of courses offered.

## **Master of Arts (MA) in Leisure Studies**

### ***Program Requirements***

One full academic year (12 months) of resident study at Dalhousie University is a minimum requirement for the one-year master's degree. Although the MA degree program officially has a one-year residency requirement, students should expect to take from 18-24 months of full-time work to complete the degree. For full-time students, the degree must be completed within four years of first registration.

Completion of the degree is also possible through part-time study. However, financial assistance is not available for students undertaking the degree on a part-time basis.

The MA Leisure Studies program consists of - 18 credit hours of courses and a thesis (equivalent to 12 credit hours). Required and elective courses are listed below. Each course is normally worth three credit hours. Electives may be chosen from the lists of courses listed in the Course Descriptions section, or from graduate courses offered by other departments at Dalhousie University, or, to a limited extent, at other universities.

### ***Required Courses***

- LEIS 5501.03: Advanced Research Methods in the Social and Natural Sciences
- LEIS 5503.03: Intermediate Statistics for Health Sciences OR another intermediate statistics course approved by the student's advisor. Prerequisite: Students must have completed an introductory course in statistics with at least a "B" grade.
- LEIS 5592.03: Interdisciplinary Basis of Leisure Science
- LEIS 9000.00: Thesis (considered equivalent to 12 credit hours)

### ***Elective Courses***

- LEIS 5512.03: Lifestyles of Ill and Disabled Persons
- LEIS 5561.03: Gender, Leisure and the Family
- LEIS 5562.03: Perspectives on Youth
- LEIS 5563.03: Leisure Behaviour and the Older Adult
- LEIS 5600.06/LEIS 5601.03/LEIS 5602.03: Independent Studies. Open to independent completion of study. Interested students should consult with the Graduate Coordinator prior to registering in the course.
- NURS 5100.03: Qualitative Research Methods

PLEASE NOTE: Not all courses listed below are offered every year. Please consult the timetable for a current list of courses offered.

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

# Course Descriptions - Health Promotion

## **HPRO 5501 Advanced Research Methods in the Social and Natural Sciences**

CREDIT HOURS: 3

This course addresses research methods and is designed to accommodate the variety of graduate student research interests in the School of Health and Human Performance. Principles and techniques of natural and social sciences will be examined using relevant examples from published literature. The instructor assumes that students have undergraduate level knowledge of research methods, however, initial classes will be spent reviewing basic principles. In addition, topics will include the philosophy of science, the logic of the research process, causality, measurement, and ethical procedures. Students will be introduced to the philosophical debate about the application of classical scientific methods to social phenomena, the qualitative and quantitative dichotomy, and the role of theory in research. This course provides students the opportunity to develop the research methods section in a research proposal either for their thesis or other research endeavour.

CROSSLISTED: LEIS 5501.03 and KINE 5501.03

## **HPRO 5503 Intermediate Statistics for Health Sciences**

CREDIT HOURS: 3

This course provides graduate students with a working knowledge of statistical issues and methods commonly used by researchers in the Health Professions. The statistical software package SPSS is introduced and used by students throughout the course. Topics covered include a review of probability and one and two sample inferences for means and proportions. This is followed by some common experimental designs, contingency tables and odds ratios. Final topics are correlation and linear regression (simple and multiple), analysis of variance, analysis of covariance, and logistic regression. A term data analysis project is required in which students make use of both statistical methods learned in class and the SPSS software package.

PREREQUISITES: An introductory statistics course

CROSSLISTED: KINE 5503.03/LEIS 5503.03/STAT 5990.03

## **HPRO 5514 Current Frameworks in Health Promotion**

CREDIT HOURS: 3

The purpose of this graduate seminar is to offer an advanced understanding of the current frameworks used in health promotion research and practice. Students will critically examine key approaches to research and practice such as the social determinants of health framework and the harm reduction framework. A key focus of the course will be on exploring population health interventions that utilize these and other frameworks, and that are aimed at reducing health inequities. The challenges and opportunities in developing and implementing population health interventions for different populations will also be debated.

## **HPRO 5516 Theoretical and Scientific Bases of Health Promotion**

CREDIT HOURS: 3

This course provides an opportunity for students to develop and further their expertise in selected areas of health education content. These areas will be examined by an analysis of relevant health-related theories and scientific inquiry. Students will prepare a paper that might serve as background information in the development of a health education program or program evaluation, and that is in a form suitable for appearance in a scholarly or popular publication.

## **HPRO 5518 Women's Health and the Environment**

CREDIT HOURS: 3

This is a multi- and interdisciplinary seminar for graduate students in any faculty. The goal of the course is to explore the interconnections between women's health and the environment, with an emphasis on environmental contaminants, health, and public policy. The course will examine the evidence linking exposure to toxic chemicals and radiation to cancer, birth defects, and other manifestations of ill-health, as well as links between air and water pollution to human health. It will examine the current policy framework for addressing environmental health issues, with special attention to the tension between industry lobbies and public interest advocacy in the face of scientific uncertainty.

## **HPRO 5595 Program Planning and Evaluation in Health Promotion**

CREDIT HOURS: 3

The impetus for this course is the conviction that health promotion programs can be improved through evaluation. Students will be introduced to both quantitative and qualitative approaches to measurement and evaluation, in ways that have meaning to health professionals whose primary business is practice. By applying what is learnt to selected health promotion programs, students are encouraged to become practitioners who evaluate.

## **HPRO 5600 Independent Study in Health Promotion**

CREDIT HOURS: 6

NOTE: Course Details listed here also apply to HPRO 5601/HPRO 5602.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **HPRO 5601 Independent Study**

CREDIT HOURS: 3

See HPRO 5600.

### **HPRO 5602 Independent Study**

CREDIT HOURS: 3

See HPRO 5600.

### **HPRO 5620 Topics in Biopsychosocial Health**

CREDIT HOURS: 3

This seminar course permits students to carry out an in-depth exploration of specific topics in health from a biopsychosocial perspective. Topics will vary from year to year and may include health issues and outcomes at the individual and societal levels including, but not limited to, HIV/AIDS, addictions, chronic disease, mental health, and disability. The course includes an analysis of selected health and health promotion interventions for addressing specific biopsychosocial health issues

CROSSLISTED: PSYO 6420.03

### **HPRO 9000 Master's Thesis**

CREDIT HOURS: 0

## **Course Descriptions - Kinesiology**

### **KINE 5501 Advanced Research Methods in the Social and Natural Sciences**

CREDIT HOURS: 3

Please see course description for HPRO 5501.03.

CROSSLISTED: HPRO 5501.03/LEIS 5501.03

### **KINE 5503 Intermediate Statistics for Health Sciences**

CREDIT HOURS: 3

Please see listing for HPRO 5503.03

CROSSLISTED: HPRO 5503.03/LEIS 5503.03/STAT 5990.03

### **KINE 5510 Cardiorespiratory Dynamics in Exercise**

CREDIT HOURS: 3

This course will involve an examination of published research concerning the health-related aspects of physical fitness. For the most part, the course will follow a seminar format with practical and/or laboratory demonstrations.

### **KINE 5516 Neuromuscular Physiology**

CREDIT HOURS: 3

The objectives of this course are to develop an understanding of how the neuromuscular system controls human movements. Both central and peripheral nervous systems are studied, but the emphasis is on how peripheral mechanisms regulate and control muscle recruitment. Weekly tutorials involve discussions of relevant research and the underlying mechanisms controlling recruitment. A weekly three-hour lab allows students to measure many of the mechanisms and properties of muscles under discussion.

### **KINE 5523 Biomechanics of Human Motion**

CREDIT HOURS: 3

This course is designed to provide an advanced understanding of mechanical principles as they apply to the analysis of human movement. Several major directions being taken in the field of Biomechanics research will be covered. This course should provide a solid foundation for students intending to conduct research in Biomechanics. Topics include kinematics and kinetics of linked systems in two and three dimensions, linear impulse momentum analysis, work-energy analysis, analysis of interactions between linked segments, functional roles of muscles, body segment parameters, data smoothing, modelling and simulation.

### **KINE 5530 Cognitive Ergonomics**

CREDIT HOURS: 3

This course is designed to provide an in-depth treatment of human information processing capabilities and how this knowledge can be applied in ergonomic settings. The format of the course is a combination of brief lectures, group seminars and individual presentations. Each member of the course will complete a project and present the results to the seminar group.

### **KINE 5572 Topics in Human Performance: Motor Control**

CREDIT HOURS: 3

This course is intended to be a graduate level seminar which attempts to provide careful examination of published research and other written work in the area of motor control. The first portion of the course will consist of a brief review of the mechanical and physiological foundations of motor control and an illustration of some of the most useful and popular paradigms in the field. The second portion of the course will turn to classic problems and current theoretical and empirical attempts to solve them. The last portion of the course will involve presentations by members of the seminar group. The format of the presentations can vary according to individual and the topic under consideration. Some suggestions would include: 1) a literature review of a specific topic, 2) a grant proposal for a research project and 3) the results of a study conducted during the class.

CROSSLISTED: PHYT 5572.03

### **KINE 5590 Measurement and Instrumentation in Human Movement Analysis**

CREDIT HOURS: 3

The objectives of this course are to provide the student with both a theoretical and practical understanding of the many issues related to instrumentation in Kinesiology. Students will be required to apply the fundamentals of measurement theory to specific instruments. Small experiments will be conducted, and students will be required to submit a written report demonstrating their understanding of how particular instruments are used, and how results are interpreted.

CROSSLISTED: PHYT 5590.03

### **KINE 5601 Independent Study**

CREDIT HOURS: 3

See KINE 5601.

### **KINE 5602 Independent Study**

CREDIT HOURS: 3

See KINE 5600.

### **KINE 5990 Interdisciplinary Human Nutrition**

CREDIT HOURS: 3

Students will acquire current information about the basic principles of human nutrition and nutritional requirements throughout the life cycle. They will also analyze a variety of psychological, social, economic, physical, educational, and cultural factors which influence eating habits. Appropriate nutrition-related community resources will be identified. The students will gain an insight into the similarities of classmates' educational backgrounds and a further understanding of their professional roles, thus enhancing possibilities for interdisciplinary cooperation in future clinical areas and the community.

CROSSLISTED: NURS 5990.03

FORMATS: Lecture | Discussion

### **KINE 6000 Graduate Seminar in Kinesiology**

CREDIT HOURS: 3

This is a mandatory component of the MSc Kinesiology program. Students are expected to attend all seminars in this series and required to attend 12 as a minimum. Each student is required to present one seminar in this series during their academic program. Students will receive written feedback on their presentation from faculty and peers. All students are required to make at least one oral or poster presentation at a local or national research meeting during the course of their degree. The suitability of the meeting will be determined by the student's supervisor in consultation with the course coordinator. Students are required to complete this course before graduating. This course will be graded pass/fail.

FORMATS: Seminar

### **KINE 9000 Master's Thesis**

CREDIT HOURS: 0

## **Course Descriptions - Leisure**

### **LEIS 5501 Advanced Research Methods in the Social and Natural Sciences**

CREDIT HOURS: 3

Please see course description for HPRO 5501.03.

CROSSLISTED: HPRO 5501.03/KINE 5501.03

### **LEIS 5503 Intermediate Statistics for Health Sciences**

CREDIT HOURS: 3

Please see listing for HPRO 5503.03.

CROSSLISTED: HPRO 5503.03/KINE 5503.03/STAT5990.03

### **LEIS 5512 Lifestyles of Ill and Disabled Persons**

CREDIT HOURS: 3

This course involves the identification and critical analysis of issues in the leisure and lifestyle of persons with chronic health problems and disabilities. Students gain a knowledge and understanding of selected issues and research through readings, field experiences, and classroom discussion. Alternative solutions to current problems faced by practitioners and advocates are assessed. Issues include psycho-social theory of illness/disability, professional preparation, legislation, service development, support services, implementation of the integration process, and research implications.

### **LEIS 5561 Gender, Leisure and the Family**

CREDIT HOURS: 3

The basis of this course is a critical examination of the theories and concepts which have been used to study gender roles and the family in contemporary society. The application of these theories and concepts to leisure is then explored. Particular attention is paid to the relationship between paid employment, household management and leisure for males and females. In addition, the impact of changing patterns of family composition is examined.

### **LEIS 5562 Perspectives on Youth**

CREDIT HOURS: 3

This course reviews some of the current issues facing youth today. Most programs which provide leisure services to youth are targeted at the majority. There are many young people who would be considered "minority" because of ethnic origin, socio-economic status, or employment status. These people are seldom served by recreation services. Unemployment and underemployment pose one of the biggest fears for young people in school. The answer may not rest with job creation programs alone. It is the purpose of this course to pursue alternatives and through an experiential component be able to interact with young people directly and identify their needs. This will result in a research project.

### **LEIS 5563 Leisure Behaviour and the Older Adult**

CREDIT HOURS: 3

The purpose of this course will be to enhance the individual's awareness of the role that leisure plays in an older person's lifestyle. The course emphasizes the effect that crime, housing, health status, fitness level, education and income have on individual's leisure behaviour. The role of organized recreation and leisure delivery systems in institutions and community settings is also elaborated on in this course.



### **LEIS 5592 Interdisciplinary Basis of Leisure Science**

CREDIT HOURS: 3

Leisure behaviour is determined by a complex multiplicity of factors including socialization, social-economic status, demographics, politics, economics, motives, perceptions, attitudes, personality, and situational determinants. This course provides an opportunity to analyze leisure behaviour including play, sport, cultural activities, by means of an interdisciplinary perspective. The course is based on social science theory applied to the study of leisure, along with historical analyses, and social and cross-cultural comparisons. A critical evaluation of leisure research is presented throughout the course.

### **LEIS 5600 Independent Study in Leisure Studies**

CREDIT HOURS: 6

NOTE: Course Details listed here also apply to LEIS 5601/LEIS 5602.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **LEIS 5601 Independent Study**

CREDIT HOURS: 3

See LEIS 5600.

### **LEIS 5602 Independent Study**

CREDIT HOURS: 3

See LEIS 5600.

### **LEIS 9000 Master's Thesis**

CREDIT HOURS: 0

## **Health Informatics**

Location:

Faculty of Computer Science

6050 University Avenue

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2740

Fax Number: (902) 492-1517

Email Address: [hinf@cs.dal.ca](mailto:hinf@cs.dal.ca)

Website: [www.healthinformatics.dal.ca](http://www.healthinformatics.dal.ca)

## **Introduction**

What is Health Informatics? Health Informatics studies the use of computing and information technology in health research, education, patient care, policy setting, and health administration. The fields of information technology, health information management and health care have undergone separate development over the past 30 years. Health Informatics provides a way of studying and disseminating knowledge and skills about the interaction of information technology, health care and people.

The principal purpose of this program is to prepare individuals with knowledge and skills to use information and information technology to support clinical care, health service administration, research, and teaching so that health care and services can be provided effectively, efficiently and to those in need. There is an urgent need for professionals and scholars who understand health and health services systems, and should also understand information technology, to provide the most useful information to meet the challenges of supporting health.

This interdisciplinary program draws on resources across the University, including faculty and courses from the Faculty of Computer Science, the Faculty of Medicine, the Faculty of Management, and the Faculty of Science.

This two-year program fee degree will require full-time students to register consistently for all six terms of residency requirement. The program can also be completed on a part-time basis by students who wish to continue working while studying. Part-time students will also be required to maintain consistent registration until completion of the program. The program consists of course work in health, information technology and management/leadership, plus a work-term or thesis.

## Staff

### Director

**Abidi, S. R.**, MBBS (Karachi), MSc (Malaysia), PhD (Dalhousie)

### Faculty

**Abidi, S. R.** (Medicine)

**Abidi, S. S. R.** (Computer Science)

**Blouin, C.** (Computer Science)

**Watters, C.** (Computer Science)

**Zitner, D.** (Medicine)

## Academic Objectives of the Program

To prepare individuals with knowledge and skills in health and information technology to:

- Support research and development and education in health
- Support patient care and health promotion
- Support policy development at local, provincial, national, and international levels
- Support health administration
- Address the fundamental questions of the purposes of health services and the role of information and information technology in health.
- Address the structuring, collection and use of information for performance indicators and quality improvement
- Address the development of clinical decision support tools and methodologies

## Admission Requirements

***This program is no longer accepting applications for admission. This program has been superseded by the Master of Digital Information.***

In order to begin studies in this field at Dalhousie University, you will need each of the following:

- An undergraduate degree in a health profession or in an information technology area
- A university course in statistics is recommended but not required
- A university course in computer programming is recommended but not required
- Preference will be given to students with two years' experience in the field (information technology or health professions). Experience will be evaluated on a case by case basis but should include some work with applying information technology to health issues.
- No requests for an admission deferral will be considered.

## Course Requirements

A student wishing to achieve this degree will have accumulated 42 credit hours consisting of 30 credit hours of required courses and either a thesis or a work term and elective courses.

# Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Courses Notes

### *First Term (Fall Term)*

- Introduction to Health Informatics (one-day orientation- non-credit)
- Health Information: Flow and Use
- Networks and the Web or Fundamentals of Clinical Care for Non-Clinicians
- Health Information Systems and Issues
- Statistics for Health Informatics

### *Second Term (Winter Term)*

- Health Information: Flow and Standards
- Knowledge Management for HI
- Research Methods
- IT Project Management
- CSCI 8890.00 Co-op Seminar (for those students interested in taking a work term). This course must be successfully completed in a term prior to when the work term is taken. Please note that there may be an extra fee for taking this course.

### *Third Term (Summer Term)*

Registration required with instructor permission.

For work-term students this term will be a work term. The Co-op Seminar course must be successfully completed prior to this term. Such students will be placed with an industry, health system partner, or health research organization. This will give them an opportunity to apply the program to specific practicum/work situations. A project report is required at the end of the work term. For thesis students, this will be a start of their research and writing work.

### *Fourth Term (Fall Term)*

- Management Skills Development
- Database and Data Mining for HI
- Three elective courses for work term students  
OR
- Research work for thesis students
- One elective for thesis students
- CSCI 8890.00 Co-op Seminar (for those students interested in taking a work term in the fifth term and have not yet taken the co-op seminar course). This course must be successfully completed in a term prior to when the work term is taken. Please note that there may be an extra fee for taking this course.

### *Fifth Term (Winter Term)*

Registration required with instructor permission.

For work-term students this term will be a work term (if not completed in the third term). The Co-op Seminar course must be successfully completed prior to this term. Such students will be placed with an industry, health system partner, or health research

organization. This will give them an opportunity to apply the program to specific practicum/work situations. A project report is required at the end of the work term. For thesis students, this will be a continuation of their research and writing work.

### **Research**

For students conducting research for a thesis, supervisors are available from medicine and computer science. Research interests of the faculty include electronic health records, data mining, health outcomes, machine learning and decision support systems, knowledge management, patient information systems and the application of standards for the exchange of health information electronically.

## **Course Descriptions**

### **HINF 6000 Introduction to Health Informatics**

CREDIT HOURS: 0

A compulsory non-credit orientation to develop an understanding and framework for the study of health informatics, and to provide an introduction to the core elements of the program.

PREREQUISITES: Admission to Master of Health Informatics Program

FORMATS: Seminar

### **HINF 6020 Research Methods**

CREDIT HOURS: 3

This course explores the logic and principles of research design, measurement, and data collection. The course offers a range of methodological issues and methods, including experimental and quasi-experimental designs, survey research and sampling, measurement, and qualitative methods.

PREREQUISITES: Admission to Master of Health Informatics Program

FORMATS: Lecture | Seminar | Discussion

### **HINF 6030 Statistics for Health Informatics**

CREDIT HOURS: 3

This course will teach students in the necessary skills to carry out a wide range of statistical analyses. Students will learn the basic principles that underlie health research design, data analysis and interpretation of results.

PREREQUISITES: Admission to Master of Health Informatics Program

FORMATS: Lecture | Seminar

### **HINF 6101 Health Information: Flow and Use**

CREDIT HOURS: 3

This course tracks the flow and use of health information in relation to population and individual health needs, including its generation, collection, movement, storage and use in various settings. The course includes a discussion of health and health information, and of the measurement of health and health services processes.

PREREQUISITES: Admission to Master of Health Informatics Program

FORMATS: Lecture | Seminar | Discussion

### **HINF 6102 Health Information Flow and Standards**

CREDIT HOURS: 3

This seminar course discusses technical and philosophical issues related to the capture and use of information. Issues include nomenclature; the reliability and accuracy of coding schema; interoperability; and, ISO/CEN, HL7 and Infoway standards development. Student projects will track the flow and use of information for hospital, community, and public health purposes.

PREREQUISITES: Admission to Master of Health Informatics Program

FORMATS: Lecture | Seminar | Discussion

### **HINF 6110 Health Information Systems & Issues**

CREDIT HOURS: 3

A course about health infostructures and their strengths and weaknesses. Students will learn about how such structures operate, the issues they generate, their impact on the health of populations and their impact on the flow and use of information. Particular attention will be paid to ethical and practical health informatics issues.

PREREQUISITES: Admission to Master of Health Informatics Program

### **HINF 6120 Fundamentals of Clinical Care for Non-Clinicians**

CREDIT HOURS: 3

This course consists of lectures and student-led seminars. The purpose is to enable non-clinicians to communicate with clinical experts by a) outlining the purposes of healthcare, b) providing information about measures of health status (comfort and function), c) outlining diagnostic strategies, d) outlining how clinicians make diagnoses, including information about diagnostic strategies, with particular reference to common ailments, e) outlining treatment choices and how clinicians distinguish between appropriate treatments for a particular condition again with reference to common afflictions. We are not aware of any other such course offered at Dalhousie University. Students are admitted to the Master of Health Informatics program from either an IT background or from a Health sector background. We have found that the entering students must be streamed so that students from the IT background will receive more of an introduction to the healthcare system and those from the Health background will take the introduction to IT course that already exists. This course will serve as the additional course required for students from the IT background.

PREREQUISITES: Admission to a health-related graduate program

FORMATS: Lecture | Seminar

### **HINF 6210 Databases and Data Mining for Health Informatics**

CREDIT HOURS: 3

Health organizations collect massive amount of data to support clinical decision-making, outcome measurement, policy setting, administration, and research. This course provides a conceptual understanding of various data mining algorithms and introduces healthcare-related data mining strategies to facilitate the mining of real-life healthcare data to provide data-driven healthcare decision-support services.

PREREQUISITES: Admission to Master of Health Informatics Program

FORMATS: Lecture

### **HINF 6220 Networks and the Web for Health Informatics**

CREDIT HOURS: 3

The purpose of this course is to provide an introduction to the principal architectures and techniques used to turn individual computers into an information system. An introduction to database design and internetworking will be followed by various protocols for communication among clients and servers across the Web.

PREREQUISITES: Admission to Master of Health Informatics Program

FORMATS: Lecture

### **HINF 6300 Project Management: A Managerial Approach**

CREDIT HOURS: 3

The course will cover the principles of management for information technology project. Project management for information technology has to take into account not only the most effective processes for people to work out the elements of a project, but also how to ensure the best use of information technology available for a project. The way in which groups work most effectively with technology and with each other will impact on the success of a project. Students will learn generic principles of project management as well as of information management within projects. Through case studies and field investigations of actual health information projects, students will gain a real-world understanding.

PREREQUISITES: Admission to Master of Health Informatics Program

CROSSLISTED: BUSI 6523.03; ECMM 6022.06

FORMATS: Lecture | Seminar

### **HINF 6901 Directed Studies**

CREDIT HOURS: 3

This course offers the student the opportunity to undertake further study into a specific topic of interest that is not covered in the regular course offerings. The student will be supervised by a faculty member competent in the area of interest.

PREREQUISITES: Permission of Director

### **HINF 6903 Special Topics in Health Informatics**

CREDIT HOURS: 3

This graduate course examines topics that are not part of the regular Health Informatics curriculum.

PREREQUISITES: Permission of Director

FORMATS: Lecture | Seminar

## **HINF 7000 Internship**

CREDIT HOURS: 6

PREREQUISITES: Permission of Director

## **HINF 9000 Graduate Thesis**

CREDIT HOURS: 12

PREREQUISITES: Permission of Director

# **History**

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# **Staff**

## **Chair of Department**

**Kesseling, Krista**

## **Graduate Coordinator**

**Mitchell, C.**

## **Professors Emeriti**

**Crowley, J. E.**

**Neville, C. J.**

**Pereira, N. G. O.**

## **Professors**

**Bell, C. M.**, BA (Calgary), MA (King's College London), PhD (Calgary)

**Cooper, A.**, BA (Toronto), MA (OISE), PhD (Toronto)

**Hanlon, G.**, MA (Toronto), Dr.de 3e Cycle (Bordeaux)

**Kesselring, K.**, BA, MA (Dalhousie), PhD (Queen's)

**Kynoch, G.**, BA, BED (Queen's), MA, PhD (Dalhousie)

## **Associate Professors**

**Bannister, J.**, BA (Memorial), MA, PhD (Toronto)

**Kozlov, D.**, MA (Univ of Mass), PhD (Toronto)

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**Roberts, J.**, BA (Hons) (Simon Fraser), MA (Queen's), PhD (John Hopkins)  
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### **Assistant Professors**

**Bingham, J.**, BA (UNB), MA (Toronto), PhD (York)  
**Binkley, L.**, BA, MA, PhD (Queen's)  
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**Parasram, A.**, BA (Dalhousie), MA (Carleton), PhD (Carleton)  
**Wright, A.**, BA & Sc (McGill), MA (Toronto), PhD (Toronto)

### **Cross-listed Faculty**

**Kirk, J.**, MA (Queen's), PhD (UBC), major appointment in Spanish  
**McOuat, G.**, BA, MA, PhD (Toronto), King's College  
**Snobelen, S.**, BA (Hons), MA (Univ of Victoria), MPhil, PhD (Cambridge), King's College  
**Treiger, A.**, BA, MA, (Hebrew Univ of Jerusalem), MPhil, PhD, (Yale)  
**Ulicki, T.**, BA (McGill), MA (St. Mary's), DPhil (Univ of Sussex)  
**Warwick, J.**, BMus (Toronto), MA (York), PhD (UCLA)

### **Adjunct (FGS)**

**Benzaquén, A.**, BA, MA, PhD (York), Mount St. Vincent University  
**Black, W.**, BA (Lawrence), MA, PhD (Toronto)  
**Clow, B.**, BA (Carleton), MA, PhD (Toronto)  
**Cottreau-Robins, C.**, BA, (Saint Mary's), MED, PhD (Dalhousie)  
**Crowley, J. E.**, AB (Princeton), MA (Mich), PhD (John Hopkins)  
**Doda, H.**, BA (McGill), MA, PhD, (Dalhousie)  
**Gechtman, R.**, BA, (Hebrew University, Jerusalem), MA, PhD (New York University)  
**Gwyn, J.**, BA (Loyola College), MA (McGill), MLitt, DPhil (Oxford, Balliol College)  
**Haigh, E.**, BSc, MSc (Alberta), PhD (Univ of Wisconsin), St. Mary's University  
**Hubley, M.**, BA (Saint Mary's), MA (King's College, London), PhD (Univ of Ottawa)  
**Kehoe, K.**, BA (Hons) (Saint Mary's), PhD (University of Glasgow)  
**MacDonald, M.**, BA (Dalhousie), BA (Univ of Calgary), MPhil, (St. Andrew's Univ, Scotland), PhD, (York)  
**MacKinnon, L.**, BA (Cape Breton), MA (UNB), PhD (Concordia)  
**Marsters, R.**, BA, MA, PhD (Dalhousie)  
**Neatby, N.**, BA (Hons) (Univ of Ottawa), MA (Queen's), PhD (Univ of Montreal), St. Mary's University  
**Pereira, N. G. O.**, BA (Williams), MA, PhD (California, Berkeley)  
**Reid, J.**, BA (Hons) (Oxford), MA (Memorial), PhD (UNB), St. Mary's University  
**Roberts, J.**, BA, MA (McGill), PhD (Dalhousie), Mount Saint Vincent University  
**Sewell, B.**, BSc (Wisconsin), MA (California), PhD (UBC), St. Mary's University  
**Slumkoski, C.**, BA (Carleton), MA, PhD (UNB), Mount Saint Vincent University  
**Smardz Frost, K.**, BA (Hon) (Wilfrid Laurier), MA (McMaster), PhD (Waterloo)  
**Stretton, T.**, BA, LLB (Adelaide), PhD (Cambridge), St. Mary's University  
**Summerby-Murray, R.**, BA, MA (Univ of Canterbury), PhD (Toronto), Saint Mary's University  
**Sutherland, D. A.**, BA (Mt A), MA (Dalhousie), PhD (Toronto)  
**Twohig, P.**, BA, MA (St. Mary's), PhD (Dalhousie), St. Mary's University  
**Walls, M.**, BA (UNB), MA (Dalhousie), PhD (UNB), Mount Saint Vincent University  
**Whidden, J.**, BA (Dalhousie), MA, PhD (Univ of London), Acadia University

### **Adjunct (Retired)**

**Bleasdale, R. E.**, BA, MA, PhD (Univ. Western Ontario)  
**Tillotson, S.**, BIS (Waterloo), MA, PhD (Queen's) King's College  
**Neville, C. J.**, BA, MA (Carleton), PhD (Aberdeen)

## **Admission Requirements**

Candidates for the one-year MA degree must hold a BA four-year degree in history or a general history BA degree. A candidate with a BA in fields other than history may be placed in a qualifying year program. Candidates for doctoral study must hold an MA degree in history or in a cognate field.

# Master of Arts (MA)

The MA is a research degree and can be done full-time or part-time. Students in the program normally spend the first term satisfying course requirements and begin their thesis research early in the winter term, under the supervision of a faculty member, or members, in the student's area of interest.

A candidate for the degree Master of Arts in History will require at least 12 months of full-time study to complete all degree requirements. The course requirement is normally satisfied by taking two designated advanced courses. If there are not two suitable advanced courses offered, a student may, at the discretion of the Graduate committee and on the recommendation of the student's principal supervisor, elect to fulfill one of the course requirements through a Directed Reading Course. Courses and reading courses may be selected from other departmental and extra-departmental offerings, subject to approval of the Graduate committee. (At least one course or reading course must be taught by a member of the History Department). Students will also enroll in HIST 5800, the Masters Seminar, a series of workshops and discussions that will culminate with the production of a thesis proposal. Topics should be chosen with a view to completion within twelve months; students should note, however, that completion within sixteen months is not unusual. To complete their degree, students must submit and orally defend a thesis of not more than 50,000 words. Thesis may be orally examined at any time. Students in the one-year MA program are required to attend the Department Stokes Seminar during the academic year.

Candidates writing theses in Canadian history must demonstrate a competent reading knowledge of French; those writing theses in other fields must demonstrate a competent reading knowledge of a language other than English, as appropriate. A language examination, when this is necessary, is part of the normal thesis approval process.

Students admitted to a qualifying year program can be full-time or part-time and take as little as three courses or as many as eight courses. The courses taken will be selected by the supervisor and approved by the Graduate Coordinator. Qualifying year students must secure at least an average of B-.

# Doctor of Philosophy (PhD)

For minimum time required to complete the program, see the [Faculty of Graduate Studies Regulations](#) in this calendar.

In order to be considered a candidate for the PhD degree, students must prepare three fields, at least one of which must be outside the student's primary research area, present a thesis proposal before the Department and pass written and oral examinations in all three fields. All students engaged in Canadian, Russian, European, Middle East and Medieval history research (and in other areas, if appropriate) must demonstrate a reading competence in a language other than English. A language examination, if appropriate, is part of the normal thesis approval process. A "pass" of the PhD field work is deemed to be a mark of A- or better in each element. Passes are recorded only as "P" on transcripts. Students who fail to attain the pass standard in one of three exams will be permitted to rewrite within three months of the exam. Students who fail to attain the pass standard on two or three of the fields (or who fail in a rewrite attempt) will be required to withdraw from the PhD program.

A thesis is required which shall not exceed 100,000 words in length, excluding footnote references and bibliography. Doctoral theses are usually to be undertaken in the areas of Canadian, British, Russian (mid-19th century to mid-20th century), and African History. Students wishing to do a PhD thesis in areas other than those named above may be recommended for admission providing that resources are available.

To qualify for the award of the PhD degree, the thesis must make a significant and original contribution to historical study by the discovery of new information, or by the original interpretation of known information, or both.

# Fields of Study by Directed Reading (PhD)

## Canadian History

The following fields are offered: History of Atlantic Canada, social, cultural, and political history of Canada, with emphasis on an integrated approach; legal history; welfare history; naval history; gender history.

## Atlantic History

This field explores the history of the Atlantic world and its relationship to the study of Atlantic Canada. Some areas of concentration include the staples trades, Native peoples, Acadians, the first British Empire, forced migrations, maritime labour, reform and responsible government, gender in Atlantic societies, industrialization, and regionalism.



## **African History**

This field may be studied with special attention to conflict and crime, social and economic history, intellectual history, or labor history especially of Anglophone Africa during the pre-colonial, colonial and post-colonial periods covering the 19th and 20th centuries.

## **British History**

The following fields are offered: British history, 1150-1850; political, social, and cultural history of England, 1150-1700; the history of northern England, 1100-1700; diplomatic, military, and political history in the 19th and 20th centuries.

## **United States History**

Fields are offered in Colonial and Revolutionary America; 19th century American social, labor, and ethnic history; Civil War and Reconstruction; 20th century American foreign relations; intellectual and cultural history.

## **European History**

Fields are available in European history 1650-1914, especially in Italian and French history, intellectual and cultural history, behavioural history, and the social history of music.

## **German History**

Only one field is available in German history: Germany 1870-1945. Within this, students may concentrate upon particular topics or periods especially relevant to their thesis work.

## **Russian History**

Two fields are available: one in nineteenth-century Russian history and one in twentieth-century Russian and Soviet history.

## **Caribbean and Latin American History**

Fields may be offered in early modern and modern Latin American history, especially in Cuban diplomatic, history (Cuba-Canada-Mexico), 19th century Cuban intellectual history, and Cuba during the Castro years.

## **Gender History**

Fields are offered, both as single units and in combination, on women and gender in 19th and 20th century North America, early modern England, modern Europe, and Africa.

## **Middle East and Islamic History**

Fields are available in pre-modern and modern history of the Middle East, Central Asia, Muslim Africa and South Asia.

## **Alternate Topics**

Offers an individually tailored field of study not offered by our current faculty but by a cross-appointed colleague at SMU or elsewhere.

# **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## **HIST 4010**

### ***Senior Undergraduate Courses***

HIST 4010.03: State Violence, Communal Conflict and Criminality in Modern South Africa

## **Course Descriptions**

HIST 5000 Directed Readings.\*

CREDIT HOURS: 3

### **HIST 5001 Directed Readings II.\***

CREDIT HOURS: 3

RESTRICTIONS: Students may only register for this course with the permission of a Faculty member and the Graduate Coordinator.

### **HIST 5004 Nature and Romanticism**

CREDIT HOURS: 3

Kant's "Copernican Revolution" in philosophy, ironically, marked a resurrection of a full-blown "idealist" philosophy of nature. This course will investigate the attempts of Kant's followers to construct a natural philosophy and its engagement with the rival mechanical world picture. It explores the implications of this endeavor for the growth of romanticism, vitalism, and our modern picture of "nature." It begins with an examination of the ambiguous heritage presented by Kant's writings on nature and proceeds through the attempts to develop a complete program of idealist "naturphilosophie" and its spread throughout European thought by the medium of romanticist art and natural philosophy.

CROSSLISTED: HSTC 4300.03

FORMATS: Seminar

### **HIST 5007 The European Enlightenment**

CREDIT HOURS: 3

The seminar examines eighteenth-century European Enlightenment and continuing controversies over its interpretations and legacies. Class discussions focus on Enlightenment debates on religion, gender, science, non-European people, society and government, and the possible impact of the Enlightenment on the French Revolution.

EXCLUSIONS: HIST 3007.03

FORMATS: Seminar

### **HIST 5045 The French Revolution**

CREDIT HOURS: 3

The seminar will focus on the current interpretations of the French Revolution. Each time the seminar is offered, it may focus on a specific theme related to the French Revolution, for example, the historiography of its origins, the Terror, or the legacy of the French Revolution for modern political culture.

FORMATS: Seminar

### **HIST 5056 Fascist and National Socialist Movements in Europe, 1900-1945**

CREDIT HOURS: 3

Between the World Wars, virtually every European country had one or more groups that considered themselves or were considered fascist: in Germany and Italy, of course, but also in France, Spain, Hungary, Romania, and elsewhere. The seminar will explore the ideals, experiences, aspirations, and political realities of the simultaneously threatening and fascinating historical problem.

CROSSLISTED: HIST 3053.03

FORMATS: Seminar

### **HIST 5060 Topics in the Civilization of Baroque Italy**

CREDIT HOURS: 3

Emphasizes the techniques and methods of studying history from archival sources in the Italian context, circa 1570-1740. Areas to be explored are Baroque Catholicism, social interaction, social status and display court culture, standards of living, routine infanticide, historical ecology and geography. Substantial use of translated and transcribed archival sources. Requires reading knowledge of French.

CROSSLISTED: HIST 4060.03

FORMATS: Seminar

### **HIST 5061 Prelates, Peasants and Primates: From Italian History to the Behavioral Sciences**

CREDIT HOURS: 3

Prelates Peasants and Primates is a directed readings course with an interest in the social sciences as they apply to historical societies. Weekly readings of articles and chapters of books drawn from works of sociology, evolutionary psychology, primate ethology, social psychology, and anthropology. Requires

reading knowledge of French.  
CROSSLISTED: HIST 4061.03  
FORMATS: Lecture | Tutorial

### **HIST 5090 Russian Society**

CREDIT HOURS: 3

Basic institutions of 20th century Russian society are considered in their historical context, with special attention to the former role of the Party, official culture and literature, the workings of the economy, and social stratification. RECOMMENDED: RUSN 1000.06, 2000.06

CROSSLISTED: HIST 3090.03, RUSN 3090.03

FORMATS: Seminar

### **HIST 5091 Soviet History Seminar**

CREDIT HOURS: 3

This is an advanced seminar on the history of Soviet Russia from 1917 to 1991. We will explore the origins, mechanisms, costs, and outcome of perhaps the most ambitious and tragic historic experiment at creating a modern yet equitable society in a country far from conducive to such an undertaking.

CROSSLISTED: HIST 4090.03, RUSN 4090.03

FORMATS: Seminar

### **HIST 5104 Punishment, Crime, and the Courts in Early Modern England, c. 1550-1850**

CREDIT HOURS: 3

This course explores the nature and development of the English criminal justice system during the period in which it first began to be exported to other areas, and at home had to deal with the turmoil wrought by reformation, war, and industrialization. This course will examine the *uses* of law – did it act in the interests of particular people or groups, and if so, how? Historians have argued that the law had both coercive and symbolic purposes – that it served to enforce and legitimize social and economic structures. We will examine these arguments and their implications. Classes will progress thematically rather than chronologically; some will be devoted to a particular type of punishment, some to the different groups of people involved in the legal process, and others to historical debates.

FORMATS: Seminar

### **HIST 5105 The English Civil War: Society, Religion and Politics 1603-1660**

CREDIT HOURS: 3

An advanced course on one of the most tumultuous and eventful periods in British history, leading up to and including civil war and revolution 1642 to 1660. Select primary sources will be used in addition to secondary works. Topics to be studied include the social structure of early Stuart England; the Church and its critics; foreign policy; radical politics; religious sectarianism; and the impact of the war and its aftermath on the populace.

CROSSLISTED: HIST 3105.03

FORMATS: Seminar

### **HIST 5106 Topics in Early Modern English History**

CREDIT HOURS: 3

Topics will vary from year to year, but may include the religious reformations, print culture, political protest, and state formation. The course will offer students the opportunity to examine in depth key features of the history and historiography of sixteenth and early seventeenth century England.

CROSSLISTED: HIST 4106.03

FORMATS: Seminar

### **HIST 5117 Winston Churchill**

CREDIT HOURS: 3

This course focuses on major controversies and events in British and world history in which Winston Churchill was a leading actor. It will examine the historiography of these subjects, and the impact of Churchill's own writing in shaping the historical record.

CROSSLISTED: HIST 4117.03

FORMATS: Seminar

### **HIST 5222 Topics in Canadian Social History**

CREDIT HOURS: 3

This seminar will explore major themes in Canadian social development. The topics discussed will vary from year to year but will emphasize such themes as: changing values in Canadian society; the nature of popular cultures; the relationship of order and disorder; the family; gender relations; and social classes. Approved with Canadian Studies.

CROSSLISTED: HIST 3222.03, HIST 4222.03

FORMATS: Seminar

### **HIST 5250 Popular Culture in the Atlantic World, 1650 to 1800**

CREDIT HOURS: 3

This course examines the history of popular culture in the Atlantic world. It focuses on using primary sources, such as diaries and journals, to explore the culture and customs in pre-industrial communities. We will discuss topics such as family relationships, popular ideologies, religious practices, and economic discussions. Students will present drafts of their research papers in class, and a revised version of the paper will be submitted at the end of term.

PREREQUISITES: Instructor's permission

CROSSLISTED: HIST 4250.03

FORMATS: Seminar

### **HIST 5300 Topics in Latin American History**

CREDIT HOURS: 3

This seminar course examines a select theme in Latin American history. The specific theme varies from year to year. Possible topics include race and nation, gender and sexuality, or political radicalism. The bulk of the work involves preparation of a significant research paper and discussion of weekly readings.

CROSSLISTED: HIST 4300

FORMATS: Seminar

### **HIST 5400 Topics in African History**

CREDIT HOURS: 3

This course will undertake a careful, in depth examination of a select theme in African history. The theme will vary from year to year, but the aim will be to probe the deep complexities of Africa's past that recent scholarship is bringing to light. Themes may be regional or continental, and could include such topics as witchcraft, resistance, urban history, religious change, migration, or nationalism. The core of the work will be a significant research paper and seminar presentations. Courses will also involve the reading, presentation, and discussion of selected readings.

CROSSLISTED: HIST 4400.03

FORMATS: Seminar

### **HIST 5401 State Violence, Communal Conflict and Criminality in Modern South Africa**

CREDIT HOURS: 3

South Africa is plagued by one of the world's highest rates of violent crime and social conflict. Despite the unprecedented level of public concern with violence, little attention is paid to the historical origins of this phenomenon. This course explores the changing patterns of crime and violence since the 1890s.

CROSSLISTED: HIST 4401.03

FORMATS: Seminar

### **HIST 5404 Crime and Punishment in Modern Africa**

CREDIT HOURS: 3

This course will interrogate the extent to which questions of state legitimacy and power can illuminate the trajectories of crime, policing, and punishment from the early colonial era in Africa to the present day.

CROSSLISTED: HIST 4404

FORMATS: Seminar

### **HIST 5430 Making of Colonial Africa (1850-1930)**

CREDIT HOURS: 3

European colonial rulers and business interests laid out the framework of the sub-Saharan African colonial order from about 1850 to the 1920s, seeking ways to exploit African labor and natural resources. But imperial plans were limited and sometimes frustrated by African interests, and by historical dynamics within Africa, such as the rise of new merchants and Islamic revolution. This course assesses how the realities of Africa intersected with European imperial ambitions to profoundly change African society during this early colonial period.

CROSSLISTED: HIST 3430.03

### **HIST 5435 Rise and Fall of African Slavery**

CREDIT HOURS: 3

Many African societies, like pre-industrial societies elsewhere, used slaves as well as other forms of labor for a variety of purposes. The rise of external slave trades after 1700 - notably across the Atlantic and Sahara - transformed many African societies into specialized slave exporters. As external slave trades declined in the 19th century, many African economies used extensive internal slave labor to produce exports, a pattern colonial governments were slow to change in the 20th century. This course examines these changes in African slavery, and how they affected such issues as gender relations and class structure.

CROSSLISTED: HIST 3435

FORMATS: Discussion

### **HIST 5452 Apartheid and After: Racial Rule in South Africa**

CREDIT HOURS: 3

The course examines not only the changes in race relations and politics, but also the effects of mining and other industries on rural and urban societies after the discoveries of diamonds and gold. Themes will include British policies and the “imperial factor”, the growth of Afrikaner and African nationalism, the Boer War and unification, the development of apartheid and South Africa’s relations with the wider world.

CROSSLISTED: HIST 3452

FORMATS: Lecture | Discussion

### **HIST 5470 Wars and Revolutions in Nineteenth Century Africa**

CREDIT HOURS: 3

Africa in the nineteenth century was profoundly reshaped by a complex set of events. Muhammed Ali undertook to modernize Egypt. New Islamic states founded in the west developed plantation economies of unrivaled size. On the Atlantic coast, merchant princes made their fortunes supplying tropical goods for Europe’s Industrial Revolution. In Central Africa the search for slaves and ivory both wreaked havoc and stimulated new states. In the south, the rise of Zulu power generated waves of conquest and consolidation. This course assesses the extent to which Africa was reshaped in the revolutionary century before colonial partition.

CROSSLISTED: HIST 3470

FORMATS: Discussion

### **HIST 5471 Wars and Revolutions in Twentieth Century Africa**

CREDIT HOURS: 3

Africa as portrayed in the Western media is a continent plagued by bloody conflicts. All too often these conflicts have not been carefully explained; rather they have been written off as “tribal” squabbles or incomprehensible episodes of barbarism. This course will examine several types of conflicts throughout the twentieth century and will seek answers to such questions as: What initiated these conflicts? What were the combatants fighting for? How did these conflicts influence wider social, economic, and political developments? In what ways did colonial policies and the colonial legacy influence African conflicts? What role has the international community played in African conflicts? What roles have African elites or local communities played in these conflicts? Grappling with these questions will allow us to move beyond simplistic explanations to acquire a better understanding of the wars and revolutions that have so marked twentieth-century Africa.

CROSSLISTED: HIST 3471.03

FORMATS: Seminar

### **HIST 5475 African Intellectuals and the Modern Experience**

CREDIT HOURS: 3

African thinkers have long pondered the challenges of the modern era and have established lines of thought with which African intellectuals now address Africa’s profound problems. But this engagement with the modern world has moved through different phases, just as the social location of the African intelligentsia has changed over time. This course will explore this intellectual history by setting specific writers in context, and then examining their original writings to ponder such questions as: What were the roots of “African Christianity”? How did African intellectuals respond to “scientific racism”? What was the appeal of Pan-Africanism? What was Negritude? How socialist was African socialism? How do postmodern insights about the invention of identity affect the idea of being “African”?

CROSSLISTED: HIST 4475

FORMATS: Discussion

### **HIST 5500 Topics in Modern History**

CREDIT HOURS: 3

This seminar is specifically intended for students in the Advanced Major and Honours degree programs in History. The specific content of the seminar varies from year to year, but generally involves examination of a subject in history in some depth, and may include an historiographical, comparative, or interdisciplinary dimension.

CROSSLISTED: HIST 4500.03

FORMATS: Seminar

### **HIST 5503 Sultans and Shahs**

CREDIT HOURS: 3

This course will examine the post-Mongol Islamic world, and the emergence and expansion of the Ottoman, Safavid, and Mughal empires between 1500 and 1800. Particular themes of concentration will be notions of legitimacy and authority, religious orthodoxy and heterogeneity and the rise of centralized bureaucracies.

CROSSLISTED: HIST 3510.03

### **HIST 5510 Topics in Islam and Middle East History**

CREDIT HOURS: 3

This course dedicated to topics dealing with the Islamic world/Middle East from the medieval era to the present. Topics include political thought in Islam, slavery in Islamic civilization, Nationalism and Ethnicity in the Middle East and Women in the Islamic world.

CROSSLISTED: HIST 4510.03

FORMATS: Seminar

### **HIST 5545 Scripture and Statecraft: The History of Islamic Political Thought (7th-21st centuries)**

CREDIT HOURS: 3

This seminar focuses on the concept of the Islamic political state as it was first developed during the time of the Prophet Muhammad and the various debates that ensued in the classical and medieval periods. The seminar also focuses on Islamic scholarly discourse regarding 'mosque and state' in the wake of colonialism, westernization, and globalization.

CROSSLISTED: HIST 4545.03

FORMATS: Seminar

### **HIST 5550 Orientalism and Occidentalism**

CREDIT HOURS: 3

This seminar is intended for senior undergraduate and graduate students interested in discussing how scholarship has historically approached non-Western and non-Christian areas of the globe. Dating back to Herodotus, Plato, and Isocrates, the description of "the Other" has been a consistent theme in European literary and academic traditions. Whether or not it was the apologetic theological rivalry between Islam and Christianity in the Middle Ages, or the Humanist mania for non-European languages and ethnography, Occidental scholarship has historically been attracted to understanding and depicting the non-Occident. This course will examine the different European intellectual traditions of early modern Europe and how they laid the foundation for subsequent 19th and early 20th century characterizations of the Islamic world. Concurrently, however, there is evidence that a discourse of "Occidentalism" emerged among Muslim scholars and literati, and the ensuing dialectic between West and East framed the introduction of a number of political and religious ideologies to the Middle East, Iran, Central Asia, and India. There will be readings and discussions of a number of different scholars and theorists - Foucault, Chakrabarty, Said - who have commented on these discourses. Equal attention will be given to those Muslim scholars - Shayaghani, Soroush, al-Ahmad - who have written and commented on these dynamics between Western and Islamic civilization.

CROSSLISTED: HIST 4550.03

FORMATS: Seminar

### **HIST 5600 Topics in Late 19th and 20th-Century American and British History**

CREDIT HOURS: 3

This course will, depending upon the staffing in any particular year, examine a selection of themes in late 19th and 20th century British and American history, including, for instance, labor/labor history, political history (including state formation), cultural history, and history of race and national identity. Depending upon staffing, this course may concentrate upon the history of one country or may offer a comparative aspect. It will be intended for graduate or senior undergraduate students with some background in either British, American, or Canadian history. Evaluation will be through research papers and, possibly, a final exam.

CROSSLISTED: HIST 4600.03

FORMATS: Seminar

### **HIST 5613 Women's Suffrage from the French Revolution to World War I**

CREDIT HOURS: 3

The question of women's participation in representative government first emerged during the French Revolution but by 1914, only two European countries granted women the right to vote. This seminar explores the suffrage movement in nineteenth century Europe and the obstacles in the process of women's enfranchisement.

CROSSLISTED: HIST 4613

FORMATS: Seminar

### **HIST 5701 Medieval Civilization**

CREDIT HOURS: 3

Each year several topics are chosen, broad enough to be used as central themes in the context of which medieval civilization may be closely examined; for instance, monasticism, universities, peasants, and popular culture. Such topics are studied in some depth, where possible using original sources, and recent periodical literature and/or monographs. Class discussions are used to unravel contentious or difficult aspects of assigned readings. Students are to write a formal research-based essay as well as several critical book reviews. Some prior knowledge of medieval European history. Graduate level students are expected to use Latin-language primary sources for the research paper; in addition, they are required to complete several critical reviews of secondary sources.

CROSSLISTED: HIST 4003.03

FORMATS: Seminar

### **HIST 5706 Topics in Medieval History**

CREDIT HOURS: 3

Topics will vary from year to year but will include the development of legal institutions in the medieval West, church-state relations, the development of institutions of central government, crown-noble relations. The class will offer student the opportunity to examine in depth key features of the history and historiography of medieval Europe and medieval Britain in the period between the years 1000 and 1400.

### **HIST 5800 The Masters Seminar**

CREDIT HOURS: 3

This course is intended to hone students' sense of their craft as historians. Its chief objective is to get students thinking about their own historical methodology, in theoretical and especially in practical terms. From the conception of a project through to its conclusion, historians should always be self-conscious about exactly what they are doing, why they are doing it, and how they are doing it. This course is designed to help develop that self-consciousness. The course will also include workshops on professional ethics, drafting grant proposals, and other such practical aspects of life as an historian. Its final product will be a polished thesis proposal. Please note that this course is a requirement for all new MA students.

FORMATS: Seminar

### **HIST 8000 Family History**

CREDIT HOURS: 6

### **HIST 8110 Women's History**

CREDIT HOURS: 6

### **HIST 8111 Russian History**

CREDIT HOURS: 6

### **HIST 8112 Russian Literature**

CREDIT HOURS: 6

**HIST 8130 Colonial & Post-Colonial Hist**  
CREDIT HOURS: 6

**HIST 8200 European History**  
CREDIT HOURS: 6

**HIST 8210 Social History**  
CREDIT HOURS: 6

**HIST 8211 Canadian Social History**  
CREDIT HOURS: 6

**HIST 8212 Social Hist (American)**  
CREDIT HOURS: 6

**HIST 8220 Maritime History**  
CREDIT HOURS: 6

**HIST 8230 American History**  
CREDIT HOURS: 6

**HIST 8250 Medieval History**  
CREDIT HOURS: 6

**HIST 8260 British History**  
CREDIT HOURS: 6

**HIST 8280 Canadian History**  
CREDIT HOURS: 6



**HIST 8281 Canadian Social History**

CREDIT HOURS: 6

**HIST 8400 African History**

CREDIT HOURS: 6

**HIST 8401 Southern Africa**

CREDIT HOURS: 6

**HIST 8402 African Social & Economic Hist**

CREDIT HOURS: 6

**HIST 8410 Culture & Development**

CREDIT HOURS: 6

**HIST 8500 Comparative Historiograph**

CREDIT HOURS: 6

**HIST 8502 Alternate Topics**

CREDIT HOURS: 6

Field Course

CALENDAR NOTES: Graduate Independent Study (Graduate Courses Only, Standard Grading with IP allowed)

FORMATS: Other (explain in comments)

**HIST 9000 Master's Thesis**

CREDIT HOURS: 0

**HIST 9530 Doctoral Thesis**

CREDIT HOURS: 0

# Industrial Engineering

Location:

Morroy Academic Building

5269 Morris Street  
Room 108  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3281  
Fax Number: (902) 420-7858  
Email Address: [industrial.engineering@dal.ca](mailto:industrial.engineering@dal.ca)  
Website: [www.dal.ca/faculty/engineering/industrial.html](http://www.dal.ca/faculty/engineering/industrial.html)

## Program Description

Industrial Engineering is at the heart of the systems that are essential to our society. From airlines to online retailers, from hospitals to manufacturers, from telecommunication companies to world-wide shipping companies, industrial engineers use applied mathematics, analytics, and operational research to design solutions to improve the performance of complex systems of people, technology, and information.

\*Students who do not have an Industrial Engineering background are required to take IENG 6900: Industrial Engineering Methodologies and IENG 6912: Introduction to Operations Research.\*

## Master's Degrees

A student's program of study for the Master's degree may be either a research-intensive program (MAsc) or a coursework intensive program (MEng). Note that a thesis-based research Master's degree is normally required to gain admission into the PhD program.

## Staff

### Department Head

**Cyrus, J. P.**, BSc (ENG) (UWI), MAsc, PhD (TUNS), PEng

### Professor Emeritus

**Das, B.**, BScEng (Banaras), MSc, PhD (North Carolina State), FIIE, FHFES, FIEE, CEng, PEng. Industrial ergonomics, workstation design, human strength measurement, anthropometric modelling, equipment, and hand tool design

### Professors

**Pelot, R.**, BAsc (Ottawa), MAsc (Alberta), PhD (Waterloo), PEng, Co-Op Advisor. Risk Analysis, maritime applications, safety and security, environmental modelling

**Diallo, C.**, BEng, MSc, PhD (Laval), PEng. Maintenance 4.0, Sustainability engineering, Cyber-physical systems, Closed-loop supply chains, Planning and scheduling

**Venkatadri, U.**, BTech (IT-BHU), MS (Clemson), PhD (Purdue), PEng

### Associate Professors

**Blake, J.**, BAsc, PhD (Toronto), PEng. Industrial Engineering, operational research, health application simulation

**Cyrus, J. P.**, BSc (ENG) (UWI), MAsc, PhD (TUNS), PEng. Vehicle routing and scheduling

**Ghasemi, A.**, BSc, MSc, PhD (Montreal), PEng. Reliability, condition-based maintenance, asset management, planning and scheduling, dynamic programming and stochastic optimization, simulation

**MacDonald, C.**, BEng (TUNS), PhD (Dalhousie), PEng. Work design, production systems

**Vanberkel, P.**, BEng, MAsc (Dalhousie), PhD (Twente), PEng. Operation research, healthcare, simulation stochastic models.  
Undergraduate Academic Advisor

### Assistant Professors

**Goerlandt, F.**, BSc (UGent), MSc (UGent), MSc (UAntwerpen), DSc (Aalto). Risk analysis and management, safety management, marine technology, marine transportation, emergency response, validation

**Kamal, N.**, BSc (UCalgary), MAsc (UBC), PhD (UBC). Health care improvement, health systems, data visualization, Stroke,

implementation science, knowledge translation

**Saif, A.**, BSc (Alexandria), MBA (NYIT), MSc (Masdar Institute), PhD (Waterloo). Stochastic optimization, supply chain management, hybrid renewable energy systems. Graduate Coordinator

**Afshari, H.**, BSc (Yazd University), MBA (IMI), MSc (AUT), PhD (UM), P.Eng

## Instructors

**Flemming, S.**, BSc (UPEI), BEng (Dalhousie), MSc (Toronto), PEng

## Cross-Listed

**Carter, A.**, MD (Western Ontario), MPH (Yale). (Cross appointed with Emergency Medicine)

**Chen, J.**, BSc (Beihang), MSc (Beijing IT), PhD (Western Ontario). Customer returns, supply chain management, revenue management, pricing, game theory (Cross appointed with Rowe School of Business)

**Johnston, C. R.**, BSc, MSc (Alberta), PhD (Calgary). Cardiovascular fluid mechanics, design engineering, sports engineering. (Cross appointed with Mechanical Engineering)

**Kozey, J.**, BSc, MSc (Waterloo), PhD (TUNS). Clinical biomechanics, occupational biomechanics, ergonomics, anthropometry, workstation design, accessibility. (Cross appointed with Health and Human Performance)

**Neyedli, H.**, BSc (Dalhousie), MSc, PhD (Toronto). Motor control, neurofeedback, human factors, ergonomics, interface design, combat identification, human-automation interaction (Cross appointed with Health and Human Performance)

**Nguyen-Quang, T.**, BSc, MSc (National Polytechnic Institute of Grenoble), PhD (Univ of Montreal and Mechanical Institute of Marseille), Transport Phenomenon, Natural patterns and Complex systems, Biological systems Modelling (cross-listed with Agriculture)

**Ülku, M.A.**, BSc (Bilkent), MSc (Çukurova), PhD (Waterloo). Theoretical modeling of service and manufacturing systems, practical logistics policies for green supply chains, behavioural issues in operations management, sustainable consumption, mathematical modeling of societal problems. (Cross appointed with Rowe School of Business)

## Adjunct Professors

**Black, N.**, BSc (Waterloo), MSc (TUNS), PhD (UNB), PEng. (Univ of Moncton). Ergonomics, musculoskeletal injury prevention, human biomechanical modelling, design for physical disabilities, work study

**Comeau, J.**, BSc, MSc (Moncton), PhD (Dalhousie). Approximate optimization models, optimization in forestry, production management, inventory management

**Eiselt, H. A.**, Dr. rer. pol (Goettingen, Germany), location models, municipal solid waste, decision analysis, mathematical methods in counter terrorism

**Khatib, A.**, MSc, PhD, HDR, Reliability, Maintenance, production, Life-cycle engineering, Sustainability.

**Sandblom, C. L.**, Fil.Kand., Fil.Mag. (Lund), PhD (Birm), Modelling and optimization of linear, nonlinear, and stochastic systems

**Sarhadi, H.**, BSc (Iran University of Science and Technology), MSc (Bu-Ali Sina University), PhD (Memorial). Transportation Planning, Scheduling, Railway Optimization

**Taghavi, M.**, BSc (Amir Kabir), MSc (Sharif), PhD (McMaster). Applications of Operations Research in Healthcare, Stochastic Optimization

**Tajbakhsh, M.**, BSc, MSc (Amir Kabir), PhD (Toronto). Supply chain, inventory and production management, scheduling, and OR

## Adjunct Retired

**Barzilai, J.**, BSc, MSc, DSc, (Technion). Measurement theory, decision analysis, optimization

## Department Secretary

**Parker, T.**

## Industrial Engineering Technician

**MacNeil, A.**, P.Eng

# General Information

## Admission Criteria

All candidates must meet the admission requirements of the Faculty of Graduate Studies, and any specific admission requirements as listed under each program.

## Application Forms

Application forms may be obtained from the Registrar's Office, Dalhousie University, PO Box 15000, Halifax, NS B3H 4R2, or through

the university's website. Prospective students are encouraged to contact the Graduate Admissions Officer for program specific information.

### **English Language Proficiency Requirement**

Information pertaining to the English language proficiency requirements is given in the Faculty of Graduate Studies Regulations Section 3.4.

### **Fees**

Information pertaining to fees and expenses can be found online in the Admission section of the Dalhousie Website.

### **Financial Assistance**

Information pertaining to financial assistance and scholarships can be found online in the Funding Opportunity section of the Dalhousie – Faculty of Graduate Studies Website.

### **Health Insurance Requirement**

Information pertaining to health insurance requirements is given in the Resources and Services section of the Dalhousie Graduate Calendar.

### **Graduate Student Program**

The graduate student's program, including supervisory committee composition, will be entered in the Graduate Student Information System (GSIS) by the department and approved by the supervisor, the graduate coordinator and FGS. The details of the program should be submitted in the first month after initial registration. The composition of the supervisory committee should be entered by the end of the second term.

### **Course Requirement**

At least three-quarters (75%) of the total course requirement for each graduate program must be taken at Dalhousie University.

### **Leave of Absence**

Students may formally apply for a leave of absence in accordance with Faculty of Graduate Studies Regulations, Section 5.8.

## **Master of Applied Science (MAsc)**

### **Admission Requirements**

A candidate to be considered for the Master of Applied Science research program must have obtained, with a high scholastic standing, an undergraduate degree in engineering or a degree in science with honours, or the equivalent, from a recognized university.

Candidates must also be recommended for admission by a faculty member in the Program in order for their application to proceed. Please note a recommendation for admission is not a formal acceptance.

Candidates for the above degree may be required to take additional undergraduate subjects as a preparation for advanced courses or to give the candidate a suitable engineering background. Such subjects are usually not considered part of the graduate program.

## **Academic Regulations**

### **Program Requirements**

A MAsc graduate program consists of not less than 12 credit hours, the graduate seminar, the research methods course and a thesis selected upon the advice of the thesis supervisor. Not more than one senior-level undergraduate course may be taken as part of the 12-credit-hour requirement.

### **Graduate Seminar**

The seminar requirement is fulfilled by completing the IENG 7000 course, which involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least one seminar presentation.

### **Research Methods**

A candidate for a MAsc degree must pass the zero-credit-hour IENG 6000 research methods course. This course involves attending a series of lectures introducing basic concepts in scientific research and completing the required assignments.

### **Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the thesis/project supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses, and any approved undergraduate course, with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

As well, all Master's degree candidates must pass an oral examination of their thesis or project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### **Time Requirement**

A candidate for a MASc degree will be required to spend at least twelve months full-time work on course work and the thesis. All students are required to register each session to maintain eligibility to continue a program of studies. Students are required to be on campus for at least two terms in the first year of their program. See Faculty of Graduate Studies Regulations, Section 7, for policies regarding the maximum length of time for degree completion and extensions.

## **Master of Engineering (MEng)**

### **Admission Requirements**

For a candidate to be considered for the Master of Engineering in Industrial Engineering program, they must have obtained an undergraduate degree in engineering in industrial engineering or a related discipline with high scholastic standing from a recognized university. Applicants with industrial experience are encouraged to apply.

### **Academic Requirements**

#### **Program Requirements**

The course requirements for the Master of Engineering is not less than 27 credit hours and the graduate seminar. Undergraduate courses, in the area of a student's interest, not taken by the student for previous credit, may be included in the program, subject to prior approval. Not more than 12 credit hours may be undergraduate credit hours. Up to 6 credit hours of the program requirements may be completed in the form of an optional project requiring appointment of a project supervisor, and submission of a final report to be assessed by the project supervisor and an internal reader. Students should seek advice from the program coordinator if they intend to pursue this option. All programs must have the approval of the department.

#### **Graduate Seminar**

The seminar requirement is fulfilled by completing the IENG 7000 course, which involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least one seminar presentation.

#### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses, and any approved undergraduate courses, with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering. Graduate

students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

#### **Time Requirement**

A candidate for a MEng degree will be required to spend at least twelve months full-time on course work and the optional project. All students are required to register each session to maintain eligibility to continue a program of studies. See Faculty of Graduate Studies Regulations, Section 7, for policies regarding the maximum length of time for degree completion and extensions.

## **Doctor of Philosophy (PhD)**

### **Admission Requirements and Procedures**

A candidate to be considered for entrance into the PhD program must meet the admission requirements of the Faculty of Graduate Studies and must have:

A research-based Master's Degree in engineering from Dalhousie University or any other recognized university, or a research-based Master of Science Degree or its equivalent from a recognized university, acceptable to the Faculty of Engineering (in the latter case, a candidate may be required to take extra subjects to develop a suitable engineering background); or,

Acceptance for registration as a candidate for a research-based Master's degree at this University.

An applicant for admission to the graduate program leading to the degree of Doctor of Philosophy should have a superior academic record and previous training or experience which indicates that the candidate should be able to do independent research.

Candidates must also be recommended for admission by a faculty member in the Program in order for their application to proceed. Please note a recommendation for admission is not a formal acceptance.

Doctoral candidates are not admitted without appropriate funding to support the student and the program of research.

#### **Admission from Master's Degree**

A candidate registered in a MAsc Degree in the department may be transferred to a PhD Degree on the recommendation of their supervisory committee, according to the Regulations of the Faculty of Engineering. The recommendation will be reviewed by the Faculty of Engineering Graduate Studies Committee (GSC) and transmitted to the Faculty of Graduate Studies.

#### **Academic Regulations**

All doctoral programs are developed under the regulations and procedures of the Faculty of Graduate Studies (see Faculty of Graduate Studies Regulations) and each program must be approved by the Faculty of Engineering and the Faculty of Graduate Studies.

#### **Program Requirements**

A PhD graduate program consists of a minimum of 12 credit hours, the graduate seminar, research methods course, comprehensive examination and thesis selected upon the advice of the thesis supervisor. No undergraduate courses are allowed for credit in a Doctoral Degree program.

Granting of credits to a student's program of studies for courses taken prior to commencement of the program requires the recommendation of the Department and approval of the Faculty of Engineering Graduate Studies Committee. A request for this transfer of credits must be made to the Department before the student's first registration or in the first term.

#### **Graduate Seminar**

The seminar requirement is fulfilled by completing the IENG 7000 or IENG 8000 course, which involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least two seminar presentations.

#### **Research Methods**

A candidate for a PhD degree must pass the zero-credit-hour IENG 6000 research methods course. This course involves attending a

series of lectures introducing basic concepts in scientific research and completing the required assignments. The research methods requirement may be waived by the Supervisory Committee if the student provides evidence of prior completion of a similar course.

### **Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the thesis/project supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with interest in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

### **Thesis Subject Matter and Supervision**

The thesis shall consist of an original investigation or design carried out under the immediate supervision of a member of the Faculty of Engineering who is also a member of the Faculty of Graduate Studies.

### **Thesis Requirement**

A candidate will be required, as a major part of the program, to submit a satisfactory thesis embodying the results of original scholarship and independent research. See the Faculty of Graduate Studies Regulations for information pertaining to doctoral theses.

### **Examination Requirements**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

A PhD degree candidate must pass all graduate level courses with a grade of at least B- and cannot carry a course failure. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

PhD candidates are also required to pass a comprehensive examination which normally take place within the fourth study term.

As well, all PhD degree candidates must pass an oral examination of their thesis project after it has been submitted in satisfactory form, and in accordance with the Faculty of Graduate Studies Regulations.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum marks as noted above shall be considered grounds for dismissal.

### **Comprehensive Examination**

The Supervisory Committee shall be responsible for conducting the comprehensive examinations.

The purpose of the comprehensive examination is to ensure that the candidate has a thorough understanding of the chosen field of study as a whole, has attained knowledge to an adequate level in the discipline and to evaluate their suitability to begin Ph.D.-level thesis research.

The comprehensive examination consists of at least two written examinations and an oral examination conducted to meet the above objective. The comprehensive examination shall normally be started within the fourth session of study from first registration. A student shall be given at least three months' notice of the examination. The topics and results of the examination will be conveyed to the Graduate Coordinator on the prescribed form and will indicate "pass", "fail", or "re-examination". The results will be added to the student's transcript.

Recommendation of the examining committee to re-examine shall only be permitted if the failure was marginal. Re-examination of marginal students must be carried out within six months of the initial examination. Students requiring re-examination shall not necessarily be required to rewrite both written examinations. Students given the opportunity to rewrite shall only be permitted to rewrite once.

Students receiving a recommendation of "fail" will be academically dismissed from the program (see FGS regulations about dismissal).

### **Time and Residence Requirements**

A student is required to register each term to maintain eligibility to continue their program of studies. See Faculty of Graduate Studies Regulations for policies regarding residency requirements and the maximum length of time for degree completion and extensions.

## Procedures and Guidelines for PhD Thesis Defences

An Examining Committee is appointed in accordance with Faculty of Graduate Studies procedures prior to the formal submission of the thesis. The Examining Committee consists of the Supervisory Committee and an external examiner recommended to FGS by the Supervisory Committee. The External Examiner will be approached and appointed by the Faculty of Graduate Studies according to Faculty procedures.

A copy of the thesis must be submitted to the Faculty of Graduate Studies at least six weeks prior to the date of the oral defence. The copy will be sent to the External Examiner, accompanied by the appropriate form. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:

- i) Course work, including the graduate seminar course (IENG 7000 or IENG 8000) and the research methods course (IENG 6000), completed;
- ii) Comprehensive examination passed;
- iii) Examining Committee established;
- iv) A written report has been received by the Faculty of Graduate Studies from the external examiner.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### IENG 6000 Research Methods

CREDIT HOURS: 0

The research methods course is designed for graduate students in the early stage of their master's or doctoral research. It introduces the requirements for graduate studies, engineering science and the research process. To this effect, the course pays attention to library services and the literature search process, making a research plan, academic writing, publishing in peer-reviewed journals, aspects of student well-being, and successfully pursuing an academic career. This course is designed to offer graduate students a roadmap through graduate studies.

FORMATS: Lecture

### IENG 6900 Industrial Engineering Methodologies

CREDIT HOURS: 3

This course gives an overview of industrial engineering methodologies with particular reference to classical industrial engineering and ergonomics. The subject areas covered include work methods and measurement, engineering economics, plant layout and material handling and industrial ergonomics. Due emphasis will be given to the application of the methodologies in an industrial environment.

PREREQUISITES: This course is not intended for graduates of an Industrial Engineering undergraduate programme.

RESTRICTIONS: Restricted to Industrial Engineering students. Students in other programs must contact the instructor for permission to register.

### IENG 6906 Occupational Ergonomics

CREDIT HOURS: 3

Consideration is given to human's anatomical, physiological and psychological capabilities and limitations for systematic analysis, identification and evaluation of human-machine-environment systems to design consumer products, equipment, tools, and the workstation. Due emphasis will be given to the application of ergonomics principles and data at the human-machine interface in industrial and other occupational settings.

### IENG 6908 Advanced Facilities Planning



CREDIT HOURS: 3

This class covers advanced topics in facilities planning and design. Models for the planning and design of production and distribution facilities will be presented in the following areas: plant and distribution centre location, layout, and material handling systems design.

### **IENG 6909 Supply Chain Management**

CREDIT HOURS: 3

This class covers advanced topics in Logistics and Supply Chain Management. Models for designing, planning, and operating supply chain logistic networks will be presented. Topics covered include supply chain network design, planning and managing inventories, transportation planning, and the role of information technology.

### **IENG 6912 Introduction to Operations Research**

CREDIT HOURS: 3

This course is a graduate level introduction to the fundamental ideas of operations research. The course focuses on mathematical modelling in deterministic and non-deterministic settings. The course covers topics in the theory and application of mathematical optimization, network analysis, decision theory, inventory theory, and stochastic processes including queuing processes. The course requires background in probability theory and linear algebra as well as some skill in computer programming.

PREREQUISITES: This course is not intended for graduates of an Industrial Engineering undergraduate programme.

### **IENG 6916 Stochastic Processes**

CREDIT HOURS: 3

This course is an introduction to the fundamentals of stochastic processes. Emphasis is placed on the analysis of the probability structure of stochastic models. Topics discussed include renewal processes, counting processes, Markov chains, Markov decision processes, birth and death processes. Stationary processes and their spectral analysis may also be discussed. Applications of stochastic processes in operations research, quality and reliability engineering are presented.

### **IENG 6917 Simulation of Industrial Systems**

CREDIT HOURS: 3

Computer simulation of industrial systems, the design of discrete simulation models, and the generation of random variables are all covered by this course. Also included is the design of simulation languages. Applications of simulation models in decision making situations arising in production, distribution and economic systems are studied.

### **IENG 6918 Decision Analysis**

CREDIT HOURS: 3

We will study the foundations of decision and risk theory and construct a correct theory and practical methodology - Preference Function Modelling (PFM) - for decision making including group decision making.

### **IENG 6920 Advanced Topics in Linear and Integer Programming**

CREDIT HOURS: 3

The course will explore advanced methods to deal with large-scale and/or uncertain linear and integer programming problems encountered in real-life applications. Large-scale optimization methods include: Dantzig-Wolfe decomposition, column generation, Lagrangian relaxation, cutting planes, branch-and-cut, branch-and-price and Benders' decomposition. Methods for dealing with uncertainty include stochastic programming, chance-constrained programming, sample-average approximation, robust optimization, and distributionally-robust optimization. Through a project, students will get a chance to apply these methods on problems drawn from different applications such as logistics, energy and finance

PREREQUISITES: IENG 6912 or instructor permission.

FORMATS: Lecture

### **IENG 6921 Nonlinear Optimization**

CREDIT HOURS: 3

Key issues in engineering design are the optimization of the design parameters and optimization of overall system performance. The objective of this course is to expose the student to modern techniques in finite dimensional optimization. Topics in unconstrained optimization will include steepest descent, conjugate gradient, and quasi-Newton methods. In the field of constrained optimization, topics will include Kuhn-Tucker theory and algorithmic methods

such as reduced gradients, gradient projection, penalty, and barrier methods. The use of constructive dual methods may also be included. Throughout the course, students will be encouraged to apply the theory to engineering decision problems.

### **IENG 6923 Distribution Management**

CREDIT HOURS: 3

The course will explore the mathematical models in distribution management, and the relationship between theoretical advances and useful applications. The following topics will be covered: location problems, vehicle routing and scheduling with multiple constraints, dynamic routing & scheduling, implementation strategies. Students will be required to undertake a project in solving a distribution management problem.

### **IENG 6962 Advanced Topics in Maintenance Engineering and Management**

CREDIT HOURS: 3

This class deals with graduate level topics in design, modelling and optimization of reliability and maintainability, and design of maintenance systems. Topics may include general repair models with partial repair and imperfect maintenance, CBM methods, and the use of mathematical models in the development of a maintenance information system.

PREREQUISITES: ENGM 2032.03, ENGM 2022.03, and one of MECH 4900.03, IENG 4548.03, ECED 3600.032 or equivalent or instructor permission

### **IENG 6964 Optimization of Health Care Systems**

CREDIT HOURS: 3

This course will focus on current research of healthcare systems. This course will illustrate how industrial engineering techniques can be applied to healthcare systems. Topics to be discussed include capacity planning, quality, decision analysis, scheduling, optimization models, and waiting line models.

PREREQUISITES: None

FORMATS: Lecture | Lab

### **IENG 6967 Advanced Topics in Engineering Risk and Safety**

CREDIT HOURS: 3

The course aims to provide advanced insights in the principles underlying safety and risk, from an engineering perspective, with primary attention to risk and safety in complex socio-technical systems. As a graduate course, the focus is on understanding, analysis, and critical evaluation of state-of-the-art concepts, theories, and methods in safety and risk research. After a broad common foundation is established for all course participants, the remainder of the course is implemented through a co-design approach. The common foundation focuses on i) basic concepts in the discipline (including safety-I vs safety-II, resilience, reliability, risk, etc.), ii) modern accident theories and analysis methods in complex socio-technical systems (including STAMP, FRAM, etc.), and iii) concepts and approaches for validation in different scientific disciplines relevant for engineering safety and risk research. The co-design approach has the objective to enable students to create specific learning objectives aligned with their research for their graduate thesis, in consultation with the course instructor, and maximally in collaboration with other students participating in the course.

PREREQUISITES: Prior knowledge of basic risk theories and analytical risk analysis methods, such as those covered in the course IENG4567.03 Engineering Risk Management, is recommended. Nevertheless, interested students are encouraged to seek instructor permission to participate in this course.

FORMATS: Lecture

### **IENG 6990 Directed Studies in Industrial Engineering I**

CREDIT HOURS: 3

This course is offered to students enrolled in a Masters program in Industrial Engineering who wish to gain knowledge in a specific area for which no appropriate graduate level courses are offered. Each student taking this course will be assigned a suitable course advisor. The student will be required to present the work of one term (not less than 90 hours in the form of directed research, and individual study) in an organized publication format and may, at the discretion of the advisor, be required to take a formal examination.

### **IENG 7000 Graduate Seminar I**

CREDIT HOURS: 0

The course is designed for continuous participation by graduate students during their degree program. Students are required to present their work to peers in seminars and to attend other student's research seminars.

FORMATS: Seminar

### **IENG 7990 Directed Studies in Industrial Engineering II**

CREDIT HOURS: 3

This course is offered to students enrolled in a PhD program in Industrial Engineering who wish to gain knowledge in a specific area for which no appropriate graduate level courses are offered. Each student taking this course will be assigned a suitable course advisor. The student will be required to present the work of one term (not less than 90 hours in the form of directed research, and individual study) in an organized publication format and may, at the discretion of the advisor, be required to take a formal examination.

### **IENG 8000 Graduate Seminar II**

CREDIT HOURS: 0

The course is designed for continuous participation by graduate students during their degree program. Students are required to present their work to peers in seminars and to attend other student's research seminars.

PREREQUISITES: IENG 7000

FORMATS: Seminar

### **IENG 8500 Meng Project**

CREDIT HOURS: 0

A Master of Engineering candidate will be required to submit a project satisfactory to the Faculties of Graduate Studies and Engineering and to make a successful oral presentation of the work.

### **IENG 8894 Co-op Work-Term IV**

CREDIT HOURS: 0

PREREQUISITES: IENG 8893

### **IENG 8900 MEng Project**

CREDIT HOURS: 6

A Master of Engineering candidate will be required to submit a project satisfactory to the Faculties of Graduate Studies and Engineering, and to make a successful oral presentation of the work.

EXCLUSIONS: IENG 8500.00

### **IENG 9000 Master's Thesis/Project**

CREDIT HOURS: 0

### **IENG 9530 PhD Thesis**

CREDIT HOURS: 0

## **Information Management**

Location:

Kenneth C. Rowe Management Building

6100 University Avenue

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3656

Fax Number: (902) 494-2451

Email Address: [sim@dal.ca](mailto:sim@dal.ca)

Website: [dal.ca/SIM](http://dal.ca/SIM)

## Introduction

The goal of the Master of Information (MI) and the Master of Information Management (MIM) Programs is to provide qualified candidates with graduate education which equips them for careers as leaders in the information professions.

The student is introduced to the development and significance of information management wherever it is practiced, to the underlying principles of the profession, and to the techniques of information organization, analysis, retrieval, and use. Each student is challenged to explore and question through a curriculum which attempts to balance professional studies with supervised practical experience and advanced academic study or individual research.

## Staff

### Director of School

**Toze, S.**

### Administrative Staff

**Humes, K.**, BPR (MSVU), Administrative Assistant

**Music, J.**, BMgmt, MPA (Dalhousie), MA (SMU)

### Professors

**Black, F. A.**, BEd (Aberdeen), MLIS (Dalhousie), PhD (Loughborough)

**MacDonald, B. H.**, BSc (Acadia), MA, MLS, PhD (UWO)

**Spiteri, L.**, BA, MA (York), BEd (Toronto), MLIS (UWO), PhD (Toronto)

### Associate Professors

**Howard, V.**, BA, MA (UBC), MLIS (Dalhousie), PhD (Wales-Aberystwyth)

**Smit, M.**, BCSc, MSc (Dalhousie), PhD (Alberta), PDF (York)

### Assistant Professors

**Conrad, C.**, BA Hons (Dalhousie), MA (Queens), MEC, PhD (Dalhousie)

**Lawson, K.**, BA (Toronto), MA (York), PhD (Toronto)

**Makani, J.**, BA (Zimbabwe), MLIS, MBA, PhD (Dalhousie)

**Mongeon, P.**, BAA, MSI, PhD (Montréal)

**Skerrett, P.**, BMgmt, MBA (Dalhousie), PhD (Capella)

**Toze, S.**, BA (Queen's), MLS (Toronto), PhD (Dalhousie)

### Lecturer

**Bannister, P.**, BA, BEd, MA (Memorial)

**Barrett, C.**, BMus (Acadia), MLIS (Dalhousie)

**Brown, A.**, BAH (Queens), MLIS (Dalhousie)

**Greik Martin, J.**, BA, MSc (Wisconsin), MLIS (Dalhousie), PhD candidate (Dalhousie)

**McNiff, L.**, BA, MA (Windsor), MI (Toronto)

### Adjunct (FGS)

**Gruzd, A.**, BS, MS (Ukraine), MSLIS (Syracuse), PhD (Illinois)

**Heggie, C.**, BA (Dalhousie), IAPP (Alberta), ERM Studies (Toronto), CIAPP-Masters

**McKenna, P.**, BA, BEd (Toronto), MA (UWO), MLIS (Toronto)

**Pluzhenskaya, M.**, BS, MS (Yaroslavl), MS, PhD (Illinois)

**Rajabi, E.**, BSc (Razi), MSc (Ferdowsi), PhD (Alcala), PDF (Dalhousie)

**Shaftel, A.**, MA (Michigan), MSc (Delaware)

**Stenstrom, C.**, BA (Simon Fraser), MLIS (UBC), PhD (Queensland)

**Wells, P.**, BSc (McGill), MSc (Toronto), PhD (Guelph)  
**Whalen, R.**, BA (SMU), MA (Chengchi), JD, PhD (Northwestern)

Students seeking further information or help in planning courses of study in the School of Information Management should contact:

MI Program Coordinator  
School of Information Management  
Room 4010

MIM Admissions Officer  
Centre for Advanced Management Education  
Room 3100

Faculty of Management  
Dalhousie University  
Kenneth C. Rowe Management Building  
6100 University Avenue  
PO Box 15000  
Halifax, NS B3H 4R2

## Admission Requirements/Deadlines

The School functions within the Faculty of Graduate Studies and its entrance requirements meet the standards of this Faculty. Candidates for the MI must hold a four-year Bachelor's Degree with at least a second class standing (B average, 3.0 GPA) from a university recognized by the Senate of Dalhousie University. An academic level of a high B+ (3.3 GPA) or better is generally held by successful applicants.

Although our Canadian application deadline is April 1, SIM accepts applications throughout the year. Early applications are strongly recommended.

The MI Program is designed for fall admission. In special circumstances, the School may admit, in January, applicants who transfer from another Library and Information Studies (LIS) program, or applicants with considerable experience in the field.

Candidates whose mother tongue is NOT English are required to demonstrate a working and a reading knowledge of English. A TOEFL score of 600, 250 for computerized testing, or a score of 100 on the TOEFL Internet-based Test (TOEFL IBT) and 5.5 for the TWE, a MELAB score of 95, an IELTS score of 8.0, a CAEL score of 70, or the General Certificate in Education in the English Language at the Ordinary or Advanced Level are acceptable.

### Application Deadlines

#### *September Admissions*

- January 31: Deadline for International applications
- March 1: Deadline for scholarship consideration
- April 1: Deadline for all Canadian applications\*

(All applicants are strongly advised to apply earlier)

For Master of Information Management admission deadline dates, please refer to section II part E.

## Master of Information Management (MIM)

The Master of Information Management (MIM) is a part-time program designed for mid-career professionals “with at least five years’ experience” in the private, public or NGO sectors. It is a part-time program offered primarily by distance complemented with face-to-face intensives.

Students earn a Certificate in IM after successfully completing 12 credit hours (equivalent to three full part I and part II courses), and a Graduate Diploma in IM after successfully completing 24 credit hours (equivalent to six full part I and part II courses).

The Master of Information Management (MIM) degree requires 36 credit hours for completion (nine courses of four credit hours each: three for online component and one for intensive component). Eight required and one elective. Students must complete the program requirements in seven years from date of admission.

A complete application includes:

- Faculty of Graduate Studies Application Form:
  - Online version: <https://dalonline.dal.ca>
  - Paper version: [www.dal.ca/admissions/apply/applying\\_as\\_a\\_graduate\\_student.html](http://www.dal.ca/admissions/apply/applying_as_a_graduate_student.html)
- \$115 Application Fee
- Letter of Intent
- Resume/Job Description
- Two reference letters (You must provide two references, preferably from supervisors (former or current) OR one supervisor and one academic. The Faculty of Graduate Studies reserves the right to request additional references. These must come directly from your referees in a sealed envelope. All references are considered confidential and as such cannot be returned to you. Your referees may use the forms provided below or write a letter of recommendation. Their original ink signature must be included.)
- Confirmation of Employment
- Official Transcripts - Original and official transcripts are required from any/all post-secondary institutions attended. All transcripts (including English translations) must bear the official stamp/seal of the issuing institution and must be forwarded directly to Dalhousie University. Transcripts that state “issued to student” are not acceptable.
- TOEFL results, where applicable

It is the policy of Dalhousie University to confirm the authenticity of transcripts and letters of reference of all recommended applicants

All admitted applicants must confirm acceptance in writing and provide a non-refundable deposit to the Student Accounts Office. This deposit will be applied toward tuition but will be forfeited if the student does not register in the academic year for which he or she was admitted. Please note that this deposit is separate

### ***MIM application deadline***

Fall: June 1

Winter: October 31

Spring: February 28

For further information about this program contact the Centre for Advanced Management Education at [Cfame@dal.ca](mailto:Cfame@dal.ca)

## **Master of Information (MI)**

The degree of Master of Information is awarded upon satisfactory completion of:

1. 48 credit hours -- 24 credit hours of required courses and 24 credit hours of electives (three credit hours of which must be an advanced technology course)
2. INFO 0590: Practicum (e.g., work placement of 100 hours)
3. In addition, students are strongly encouraged to attend the array of professional, research and networking opportunities provided by the School and the broader Faculty of Management.

### ***Two-Year Program***

Full-time attendance during the Fall and Winter terms for two years.

### ***Part-Time Program***

The degree is to be completed within seven years. Each calendar year, a part-time student may take no more than 15 credit hours offered by Dalhousie University. In the first year a focus on required courses is beneficial.

## **Master of Information/Juris Doctor (MI/JD)**

A four-year course of study leading to the combined degrees Master of Information (MI) and Juris Doctor (JD). A total of 36 credit hours of MI courses and 79 to 83 JD credit hours are needed to complete the MI/JD program.

Students who apply for the combined MI/JD program must meet the admission standards for both the Schulich School of Law and the School of Information Management.

For further information about this program contact the MI Program Coordinator, School of Information Management, and/or the Director, Admissions and Career Development, Schulich School of Law.

## **Master of Information/Master of Public Administration (MI/MPA)**

A three-year full-time course of study leading to the degrees Master of Information and Master of Public Administration. A total of 81 credit hours (36 MI and 45 MPA) are needed to complete the MI/MPA program.

Applicants must gain separate and independent admissions to both Schools. For further information contact the MI Program Coordinator or the MPA Graduate Coordinator.

## **Master of Information/Master of Resource and Environmental Studies (MI/MREM)**

A 28-month course of study leading to the combined degrees Master of Information and Master of Resource and Environmental Management (MI/MREM). A total of 66 credit hours (27 MI, 18 MREM plus 18 credit hours of electives and MGMT 5000) are needed to complete the MI/MREM Program.

Applicants must gain separate and independent admission to both Schools. For further information contact the MI Program Coordinator or the MREM Program Coordinator.

## **Master of Information Certificates (MI/Cert)**

*These Certificates are limited to students enrolled in the Master of Information (MI) program at Dalhousie University.*

**Do you want to demonstrate achievement in a defined area of information management? Do you want to align your learning with specific career goals? Consider completing a MI Certificate.**

Our Master of Information (MI) degree is versatile, giving students the knowledge and skills to work in many sectors and organizations. The curriculum responds to the ever-changing, broad-based nature of the information management field.

For MI students wanting a more specialized learning experience, we offer a suite of MI Certificates. These Certificates offer students the ability to concentrate their studies within the following areas: Librarianship, Librarianship – Youth & Children's Services, Archives, User-Centred Design, Information Management and Policy, and Data Management. See below for more details.

Each certificate requires completion of **three Elective Courses (9 Credits)**. During their degree, MI students can choose to complete **up to two Certificates**. If an elective course is included in one Certificate, it cannot be counted towards another. The electives within the Certificates will count toward both the Certificate and the Degree.

Visit the [MI Certificates](#) page for full details on each certificate.

Visit our [Courses Offered](#) page for full details on each course, including syllabi.

*Questions?* Contact Janet Music, MI Program Coordinator ([jlmusic@dal.ca](mailto:jlmusic@dal.ca)).

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

### MI (INFO Courses)

Core courses are INFO 0590, MGMT 5000, INFO 5500, INFO 5515, INFO 5520, INFO 5530, INFO 5570, INFO 5590 and INFO 6540; all other 6000 courses are electives. All courses with the 'O' prefix are non-credit. Not all 6000 level courses are offered each year. The curriculum has been organized with sufficient flexibility to allow students to pursue an individual research project, or to develop a subject specialty through reading courses or the thesis option.

SIM students are encouraged to take graduate-level courses offered outside SIM and may take a maximum of 12 credit hours outside the School. Advance approval must be obtained from the course instructor and the MI Program Coordinator or the Director of SIM.

## Course Descriptions-MGMT

### **MGMT 5000 Management Without Borders: A Foundation Course for Masters Students in Management**

CREDIT HOURS: 3

This course places management in its broadest context and helps students from diverse disciplines understand the complex social, economic, ecological, political, and technological forces shaping 21st century leadership in the public, private and non-profit sectors. Key themes explored in the course include systems thinking, responsible leadership, sustainable economic development, stakeholder theory, risk management and knowledge management. A significant portion of the course is devoted to interdisciplinary / inter-professional group work. Students from different programs are brought together to work with a Nova Scotia organization that has identified a relevant and timely project topic for the group. The project provide students with the opportunity to hone important skills in team dynamics, interpersonal communication, project management, managing scope and ambiguity, information gathering, research and writing professional reports. The course is team taught by leading faculty from across the Faculty of Management as well as guest speakers. Learning opportunities are delivered in a mix of formats, including lectures, tutorials, readings, multidisciplinary cases, and group discussions.

FORMATS: Lecture | Tutorial

### **MGMT 5001 Information, People and Society. Part 1**

CREDIT HOURS: 3

This course provides an introduction to the economic, political, and social dimensions of an information-rich environment. Includes consideration of the historical development of information and knowledge production, issues of control versus free flow of information management in support of situational understanding and decision-making, the organization of knowledge, and the ethical and legal aspects of information management.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5002 Organization of Information, Part 1**

CREDIT HOURS: 3

Information management is the management of organizational processes and systems that acquire, create, organize, distribute, and use information. This course examines the various means by which information can be organized to facilitate its retrieval, management, and use, and provides an overview of the principles and theories of metadata development and implementation in the digital environment. Emphasis will be placed on metadata interoperability, vocabulary control, standardization, quality control and evaluation. Contextually relevant information is essential to support decision making and strategic planning by individuals, groups and organizations. An introduction to the principles of IA is included, as they interconnect with best practices in the Organization of Information.



### **MGMT 5003 Information Systems & Technologies, Part 1**

CREDIT HOURS: 3

This course makes clear the relationship between IT and IM, often misconstrued in organizations. The course includes theories of databases and integrated systems design, allied with practical applications of a wide range of information technologies to support organizational goals. These include traditional intranet and extranet applications along with emerging Web 2.0 technologies. Concepts of information architecture (IA) are introduced relating to the design of shared information environments which are often web-based, including intranets, databases, and online communities. The practices of IA are examined through analyses of real organizations and how the information environment can best serve their mission, goals, processes, clients, suppliers, and other stakeholders.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5004 User Experience, Part 1**

CREDIT HOURS: 3

Understanding of theories and practices of human computer interaction is a key determinant of organizational success. This course explores how technology affects human use and examines the process from conception of an idea to design and evaluation, with a particular emphasis on Web-based activities. The course discusses individuals' and groups' information seeking behaviours in public and private contexts, and the theories and models of information seeking behaviour that contribute to a nuanced understanding of the user experience.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5005 Information Policy, Part 1**

CREDIT HOURS: 3

This course explores a range of critical information issues facing organizations and the effects of policies and legislation on information management and organizational effectiveness. Topics include access to information, freedom of information, protection of privacy, preservation of information, etc. Professional ethics guiding information professionals are discussed alongside compliance. By law(s) in Canada, all government and corporate entities are required to appoint an individual responsible for privacy within the organization, and all government and selected other agencies are required to delegate staff responsible for information access and privacy. Discusses the roles of all levels of government, the private and not-for-profit sectors, and key individuals, in developing policies which affect information creation, control, access and use. Focuses on Canadian issues, while including international perspectives.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5006 Program Evaluation, Part 1**

CREDIT HOURS: 3

Introduces the concepts and components of evaluation as part of the increasing demand for accountability and as an integral part of program management. The course uses evaluation theory and program theory as the basis for all evaluation activity. Connection will be made with current evaluation issues and debates in the public and non-profit sectors.

### **MGMT 5007 Research Methods, Part 1**

CREDIT HOURS: 3

Introduces concepts, methods (both quantitative and qualitative), and the practices of research that support evidence-based information management practice. Addresses the nature and uses of research, tools for research, handling of evidence, analysis, and interpretation of findings, reporting of results, evaluation of published reports, and the management of research.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5008 Knowledge Management, Part 1**

CREDIT HOURS: 3

Knowledge management (KM) encompasses a range of theories and practices relating to the creation, identification, accumulation, and application of knowledge to meet organizational goals. This course discusses theories of KM, intellectual capital and learning organizations, and practices for efficient and effective harnessing of organizational knowledge. An integrative approach is adopted, based on the key KM theories and concepts developed in the past decade and applying them across a wide range of organizational settings.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5009 Collaboration, Part 1 (Elective)**

CREDIT HOURS: 3

Geographically dispersed workplace teams who cross time, space and organizational boundaries are increasingly common. Information managers increasingly contribute expertise to ensure that such teams have effective decision-making processes and contribute to organizational strategic goals. Virtual collaboration can take place through many modes including audio or teleconferencing, online communities, and others. Team members have a common purpose and interdependent organizational and performance goals. This course introduces theories and concepts relating to the rationale for, benefits and challenges of virtual workplace teams, steps for developing effective virtual teams and examples of technology that supports such teams.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5010 Project Management, Part 1 (Elective)**

CREDIT HOURS: 3

This course introduces theories and practices of project management (PM) related to project objectives, development stages and control variables such as time, cost and scope. PM stages include initiation, development, execution and maintenance and the course explores these through workplace case studies related to students' professional experience. Adaptive as well as pre-planned methods and approaches are explored, including process-based systems, critical path, and event chain.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5011 Management of Privacy, Part I**

CREDIT HOURS: 3

This course provides an overview of privacy and how it impacts organizations in both the private and public sectors. In this course we will address the various ways of identifying and mitigating privacy risk.

CALENDAR NOTES: Distance/Online: Lectures and online discussions, synchronous and asynchronous, all online via Brightspace Course Mgmt. System

RESTRICTIONS: Restricted to students registered in the Master of Information Management program

FORMATS: Online Delivery

### **MGMT 5012 Records Management, Part 1 (Elective)**

CREDIT HOURS: 3

How organizations engage in document or records management has a direct bearing on their efficiency and effectiveness, including legal and ethical compliance. The course offers a comprehensive introduction to the field of records and information management in all formats including, but not limited to, paper and digital. Topic covered include records creation, evaluation, maintenance and control; records classification system; records retention; records disposition; and vital records and continuity planning.

PREREQUISITES: MGMT 5002.03

CROSSLISTED: INFO 6370.03

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5015 Information Policy, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5005.03 Part 1 and is a face-to-face, two-day intensive period. Course will allow students to bring together and apply the concepts and materials from MGMT 5005, consider the international context within which information policy issues in Canada are situated, and to provide students with the opportunity for sufficient grounding in relevant areas of law.

COREQUISITES: MGMT 5005.03

FORMATS: Lecture | Discussion

### **MGMT 5020 Capstone Course, Part 1**

CREDIT HOURS: 3

Based on individual learning objectives, students may choose either a case study or a research project as the final assessed item for the Program Structure. They will have been advised, in light of their interests, to take either MGMT 5006 or MGMT 5007 as preparation for the Capstone. Students work with an advisor, under the general supervision of the course instructor, to complete a case or a project of special relevance to their workplace. Cases and projects are assessed on the extent to which they demonstrate application of the theories and techniques explored throughout the program.

PREREQUISITES: MGMT 5006.03 or MGMT 5007.03

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5101 Information, People and Society, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5001: Part 1 and is a face-to-face, two-day intensive period. Course will outline and emphasize options and strategies to address information management issues arising in the context of topics considered in MGMT 5001 and developed from IM case studies. [A take home exam will be completed following the onsite intensive.]

COREQUISITES: MGMT 5001.03

FORMATS: Lecture | Discussion

### **MGMT 5102 Organizational of Information, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5002: Part 1 and is a face-to-face, two-and-a-half-day intensive period. Course will focus on practical applications of theories learned in MGMT 5002, notably metadata standards and document content management systems. [A take home test will be completed as part of this intensive.]

COREQUISITES: MGMT 5002.03

FORMATS: Lecture | Discussion

### **MGMT 5103 Information Systems and Technology, Part 2**

CREDIT HOURS: 1

This course complements MGMT 5003 and is a face-to-face, two-and-a-half-day intensive period. Course will focus on the practical applications of theories learned in MGMT 5003, notably working in an "always on" information environment, business intelligence, influences of the "mash-up" and social networking.

COREQUISITES: MGMT 5003.03

FORMATS: Lecture | Discussion

### **MGMT 5104 User Experience, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5004 and is a face-to-face, two-day intensive period. Course will build on knowledge gained during the online course MGMT 5004. Students will learn and practice effective ways to present plans and findings from usability studies, and work as a team during a mock UCD process.

COREQUISITES: MGMT 5004.03

FORMATS: Lecture | Discussion

### **MGMT 5105 Government Structure and Organization**

CREDIT HOURS: 3

This course focuses on the Canadian system of government and addresses basic organizational theory and design as well as fundamental issues of public management.

FORMATS: Online Delivery

### **MGMT 5106 Program Evaluation, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5006 and is a face-to-face, two-day intensive period. Course will build on knowledge gained during the online course MGMT 5004. Students will learn and practice effective ways to present plans and findings from usability studies, and work as a team during a mock UCD process.

COREQUISITES: MGMT 5006.03

FORMATS: Lecture | Discussion

### **MGMT 5107 Research Methods, Part 2**

CREDIT HOURS: 1

Complements MGMT 5007 which introduces concepts, methods (quantitative and qualitative), and the practices of research that support evidence-based information management practice. Addresses the nature and uses of research, tools for research, handling of evidence, analysis, and interpretation of findings, reporting of results, evaluation of published reports, and the management of research.

COREQUISITES: MGMT 5007.03

FORMATS: Lecture | Discussion

### **MGMT 5108 Knowledge Management, Part 2**

CREDIT HOURS: 1

This two-day intensive complements the online course MGMT 5008-Knowledge Management, Part 1, that defines the theoretical & practical applications of knowledge management as it applies to organizational growth and development. The course elaborates on the identification, creation, accumulation, and application of information as it is transformed to intellectual capital for learning organizations.

COREQUISITES: MGMT 5008.03

FORMATS: Lecture | Discussion

### **MGMT 5109 Collaboration, Part 2 (Elective)**

CREDIT HOURS: 1

Course complements MGMT 5009: Part 1 and is a face-to-face, two-day intensive period. Course will help students apply the theories and concepts learned in MGMT 5009 through the examination of case studies of collaboration. Students will be LED through the process of choosing an appropriate technology and devising an implementation plan within their own organization.

COREQUISITES: MGMT 5009.03

FORMATS: Lecture | Discussion

### **MGMT 5110 Strategic Management in the Public Sector**

CREDIT HOURS: 3

This course explores the concepts, potential and dynamics of strategic management in modern public administration. A wide variety of management instruments and techniques are analyzed.

FORMATS: Online Delivery

### **MGMT 5111 Management of Privacy, Part II**

CREDIT HOURS: 1

The course will integrate the subject matter covered in MGMT5011: Management of Privacy: Part I. This course (Part II) will be structured upon the knowledge and understanding of privacy and its management gained from lectures, discussions, and readings from MGMT5011: Management of Privacy: Part I. This continuation of the Management of Privacy will further explore strategies, options, and tools to address privacy issues faced by organizations.

COREQUISITES: Must be registered in or completed MGMT 5011

RESTRICTIONS: Restricted to MIM Students

FORMATS: Lecture | Seminar

### **MGMT 5112 Records Management, Part 2 (Elective)**

CREDIT HOURS: 1

How organizations engage in document or records management has a direct bearing on their efficiency and effectiveness including legal and ethical compliance. This course offers a comprehensive introduction to the field of records and information management in all formats including, but not limited to, paper and digital. Topics covered include records creation, evaluation, maintenance, and control; issues related to the maintenance, storage, and disposition of records.

COREQUISITES: MGMT 5012.03

FORMATS: Lecture | Discussion

### **MGMT 5120 Capstone Course, Part 2**

CREDIT HOURS: 1

This two-day intensive session will include an in-class critical evaluation exercise relating to the MIM program's learning objectives and students' perceived learning outcomes. The remainder of the intensive will involve student presentations of their projects followed by question-and-answer sessions.

COREQUISITES: MGMT 5020.03

FORMATS: Lecture | Discussion

### **MGMT 5125 Policy Formulation & Analysis**

CREDIT HOURS: 3

This course covers the techniques, theory and contextual underpinnings central to effective policy management. The course explores strategic approaches to policy design and the role of the policy analyst in modern government.

FORMATS: Online Delivery

**MGMT 5135 Managerial Economics**

CREDIT HOURS: 3

This course elucidates basic microeconomic theories and principles and applies these to economic decision making. The course increases understanding of the relationship between economic theory and economic policy.

FORMATS: Online Delivery

**MGMT 5140 Public Economics**

CREDIT HOURS: 3

Introduces the basic principles of public finance and macroeconomics. The role of risk analysis in public sector decision-making is also explored. The course places a special emphasis on the role of government in the economy and on the application of economic theory in public policy analysis within the framework of the Canadian federation.

CROSSLISTED: PUAD 5140.03

FORMATS: Online Delivery

**MGMT 5146 Research Methods**

CREDIT HOURS: 3

This course provides a practical setting for understanding the purchase, management, and evaluation of research products. Applied research methods, research services and best practices are discussed in depth.

FORMATS: Online Delivery

**MGMT 5155 Financial and Managerial Accounting**

CREDIT HOURS: 3

This course reviews each of the forms of accounting and financial data that public sector managers will be faced with now – and in the future. The essential concepts of financial and managerial accounting are comprehensively reviewed.

FORMATS: Online Delivery

**MGMT 5160 Modern Comptrollership**

CREDIT HOURS: 3

This course focuses on the public policy and management issues of governance. It emphasizes development of the skills necessary to assess financial management approaches, develop business plans and implement performance measurement.

FORMATS: Online Delivery

**MGMT 5210 Project Management, Part 2**

CREDIT HOURS: 1

This onsite intensive complements the distance portion of this course (MGMT 5010), the description and goals for which are provided separately.

COREQUISITES: MGMT 5010.03

FORMATS: Lecture | Discussion

**MGMT 5250 Strategic Financial Management**

CREDIT HOURS: 3

This class focuses on the financial public policy and management issues of governance, budgeting, and accountability. It emphasizes development of the skills necessary to assess financial management approaches, develop business plans and implement performance measurement.

RESTRICTIONS: Graduate Level

FORMATS: Lecture

**MGMT 6400 Municipal Government**

CREDIT HOURS: 3

The course looks at local government's position in the broader public governance structure, its powers and responsibilities, structure and resources

interaction with the public, and advocacy role. The course emphasizes the municipal manager's perspective which is to both understand an issue and develop and promote workable solutions for the municipality.

FORMATS: Other (explain in comments)

### **MGMT 6501 Business and Government**

CREDIT HOURS: 3

This course presents the relationship between government and business in North America. It offers a practical approach to understanding the differences in how government and business operate, highlighting the techniques used by each side to influence the other.

FORMATS: Online Delivery

### **MGMT 6525 Program Evaluation**

CREDIT HOURS: 3

This course examines the theory, methods, and issues of this growing field. The course emphasizes the skills necessary to assess feasibility of a programme evaluation and to design it. Topics also include underlying values, alternative approaches, and implementation and utilization.

FORMATS: Online Delivery

### **MGMT 6555 Managing the Information Resource**

CREDIT HOURS: 3

This course examines the complex technological changes affecting public administrators. It provides broad-based information about the technological advances underway in Canada and fosters understanding of the opportunities and problems these changes present.

FORMATS: Online Delivery

### **MGMT 6610 Conflict and Negotiation Management: Personal Practice Foundations**

CREDIT HOURS: 3

This course explores the world of interpersonal communication, conflict and negotiation and the variety of approaches and range of skills needed to solve problems, reach agreements, and maintain relationships. It will enable participants to understand the positive and negative dimensions of conflict, analyze the dynamics of formal and informal negotiations, and interact with others with greater awareness, intention, and skill.

CROSSLISTED: MGMT 4610

FORMATS: Lecture | Discussion

### **MGMT 6650 Human Resource Management**

CREDIT HOURS: 3

This course explores the evolving practices and challenges faced by organizations seeking to excel in human resources – an essential determinant of organizational success.

FORMATS: Online Delivery

### **MGMT 6700 Managing People in Diverse Organizations**

CREDIT HOURS: 3

This course explores how managers can deal effectively with human problems in their organizations. Topics include motivation, leadership, communications perception, and group dynamics.

FORMATS: Online Delivery

### **MGMT 6701 Directed Readings**

CREDIT HOURS: 1

Provided students with an opportunity to develop a specific interest in the information management field by studying an aspect of a topic in greater detail than is possible within an existing course, studying an area not currently covered by the curriculum, or conducting a research study or special project.

Available by arrangement with the Director.

FORMATS: Online Delivery

### **MGMT 6702 Directed Readings**

CREDIT HOURS: 1

Provides students with an opportunity to develop a specific interest in the information management field by studying an aspect of a topic in greater detail than is possible within an existing course, studying an area not currently covered by the curriculum, or conducting a research study or special project.

Available by arrangement with the Director.

FORMATS: Online Delivery

### **MGMT 6703 Directed Readings**

CREDIT HOURS: 1

Provides students with an opportunity to develop a specific interest in the information management field by studying an aspect of a topic in greater detail than is possible within an existing course, studying an area not currently covered by the curriculum, or conducting a research study or special project.

Available by arrangement with the Director.

FORMATS: Online Delivery

### **MGMT 6705 Analytical Methods**

CREDIT HOURS: 3

This course, an advanced graduate course, investigates public-sector organization, research methods and management practices. It reviews strategies and methods guiding organizational change, renewal, and re-engineering.

### **MGMT 6735 21ST Century Public Service Leadership**

CREDIT HOURS: 3

High intensity leadership for improved governance, management, and service delivery is vital to public services in Canada. This course helps develop public service leaders by exploring the latest theory and best practices, emphasizing the latest concepts and approaches, visioning and strategic thinking, management excellence, team building, engagement, and ethics.

PREREQUISITES: MGMT 5125.03, MGMT 5105.03

FORMATS: Lecture | Discussion

### **MGMT 6745 Risk Analysis and Management in the Public Sector**

CREDIT HOURS: 3

This course offers students the opportunity to analyze, understand and manage risk in the public sector. The approach combines risk management theory and practice from several disciplines. It aims to help public managers and policy analysts understand, assess, and manage, complexity, uncertainty and ambiguity more effectively.

FORMATS: Online Delivery

### **MGMT 6755 Intergovernmental Relations in Canada**

CREDIT HOURS: 3

This course focuses on a wide array of policy areas and uses case studies to demonstrate how intergovernmental issues - such as fiscal federalism and coordination of service delivery - are successfully resolved.

FORMATS: Online Delivery

## **Course Descriptions-INFO**

### **INFO 0590 Practicum**

CREDIT HOURS: 0

In combination with required MI course work, the Practicum placement in an information setting is an essential experiential learning element in the school's curriculum, and a key element in the professional training for information management students. The 100-hour placement enables the student to test and evaluate class theory, to contribute by actual participation, and to explore areas of particular interest for course specialization and future employment. Placements are arranged in consultation with the MI Program Coordinator.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 5500 Information in Society**

CREDIT HOURS: 3

Provides an introduction to the economic, political, and social dimensions of an information-rich environment. Includes consideration of the historical development of library and information studies, knowledge production, issues of control versus free flow of information, the social organization of knowledge, and the ethical and legal aspects of information services.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 5515 Organization of Information**

CREDIT HOURS: 3

Introduces the theory and applications of information organization. Primary topics include describing and representing information in various media; subject classification theory and techniques; authority control; controlled vocabulary; indexing fundamentals; and relation of organization to information retrieval systems. Traditional, library-oriented, and more recent computer-based techniques, tools, and theories are examined.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 5520 Research Methods**

CREDIT HOURS: 3

Information professionals require knowledge of formal research processes in order to support the goals of their organization by contributing to evidence-based decision-making. This course introduces fundamental concepts of research, the nature and uses of research, tools, and methods (both quantitative and qualitative), handling of evidence, analysis and interpretation of findings, reporting of results, evaluation of published reports, and the practice and management of research.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 5530 Information Sources, Services & Retrieval**

CREDIT HOURS: 3

Offers both a theoretical and a practical introduction to information services. Discusses users and their information-seeking behaviours, major categories of reference resources and how best to match appropriate resources to the user via effective reference interviews. Explores evaluation techniques and uses of reference resources in various formats. Includes strategies of online searching both in specialized databases and the Web.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 5570 Organizational Management & Strategy**

CREDIT HOURS: 3

Introduces management theories and practices for organizational functions occurring in any type of information setting. Examines elements involved in effective strategic planning, implementation and management including personnel, budgeting, policy writing, and change management. The INFO 5570 capstone is intended to bring synthesis to the whole of the MI experience.

PREREQUISITES: INFO 5500.03, INFO 5515.03, INFO 5530.03, MGMT 5000.03

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 5590 Information Management Systems**

CREDIT HOURS: 3

In Information Management Systems we will investigate a wide range of current issues in information technology, information systems, and web-based applications with a particular emphasis on mobile and social media applications and services. We will also explore the principles of user interface design, systems analysis, information needs analysis, information systems requirements and project planning. Finally, we will examine how modern information and communication technologies (ICTs) have been and are changing the way we communicate, collaborate, share information, innovate, perform, socialize, and work, and how these technological changes are affecting the role and functions of information managers in the public and private sectors.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6070 Reading and Reading Practices**

CREDIT HOURS: 3

This seminar course will examine theories of reading from social, psychological, and literary perspectives. The course will discuss literary practices and the evolution of the concept of literacy in an era of cultural and technological change.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM



### **INFO 6090 Culture of Privacy**

CREDIT HOURS: 3

This course explores the ever-evolving area of privacy. What is the current culture of privacy? What will privacy look like into the future? As a professional, you need to understand the culture of privacy and develop the skills, knowledge, and competencies to apply a privacy filter to your world. Through discussion, readings, and observation this course will provide you a holistic view of the understanding, application, and evolution of privacy.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6100 Information in Public Policy and Decision Making**

CREDIT HOURS: 3

This course addresses the role(s) of information in policy and decision-making at local, national, and international levels. Evidence-based policy making is relatively new and challenging. This course examines the research-policy interface, especially enablers and barriers to use of information of several domains and uses case studies to illustrate concepts.

CROSSLISTED: PUAD 6150.03, ENVI 6100.03

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6150 History of the Book**

CREDIT HOURS: 3

Explores the history of the book from its early beginnings to its present manifestations. While greatest emphasis will be placed upon the history of the book from the mid-15th century to the present, the course will also discuss the history of important precursors of mechanical printing, and literacy, books, and manuscripts in the ancient and medieval periods.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6250 Services and Resources for Young Adults**

CREDIT HOURS: 3

Introduces the social, intellectual, and psychological nature of adolescence, with respect to reading, listening and viewing interests.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6270 Introduction to Data Science**

CREDIT HOURS: 3

This course serves as an introduction to data science, an increasingly important set of skills and techniques for business intelligence, effective governance, and the research process. The amount of data we generate increases year on year. As computers have begun to play roles in many aspects of our daily life, our actions and interactions leave digital traces. This has led both to an explosion in the amount of data that we generate and an increased interest in analyzing and understanding that data. This class will give you an introduction to the skills you need to effectively collect, manipulate, and analyze data yourself. Rather than being constrained to using any specific data analysis software, we will focus on using the flexible programming language Python. You will receive a thorough introduction to Python, learning how to use a variety of its built-in capabilities as well as a number of available data analysis packages. By the course's end you should be capable enough that you will be able to begin teaching yourself and expanding your data science skills.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM, MBA

### **INFO 6290 Managing Research Data**

CREDIT HOURS: 3

Information professionals are increasingly called upon to support researchers in their efforts to manage the expanding volume, variety, and velocity of research. This course introduces the theory and practice of research data management across multiple disciplines, including data policy, data management plans, data standards, data rescue, and research data services.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

FORMATS: Lecture

### **INFO 6300 Government Information Resources**

CREDIT HOURS: 3

This course examines the production, organization, and dissemination of government information. Focusing on the Canadian context, and drawing on international comparisons, the course takes a practical approach to exploring government information and data resources, approaches for working with these materials, and key themes such as access, open government, and preservation.

PREREQUISITES: INFO 5530 (recommended)

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: MGMT 4300.03

### **INFO 6310 Resources for Business Intelligence**

CREDIT HOURS: 3

Examines the value of information in a competitive environment from the perspectives of various types of business information, cost and management of information, developments on the Internet, and the role of governments. In addition, discerning client needs and packaging of information for client use are considered.

PREREQUISITES: INFO 5530.03 (Recommended)

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: MGMT 4310

### **INFO 6320 Legal Literature and Librarianship**

CREDIT HOURS: 3

An introduction to the major sources of Canadian legal information, and the fundamental principles, issues, and practices in law librarianship.

PREREQUISITES: INFO 5530.03 (recommended)

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6330 Cataloguing and Classification**

CREDIT HOURS: 3

Examines the theories, principles, and practices of bibliographic description, including the application of national standards. Covers the description of print and non-print sources, principles and practices of authority work, the application of encoding standards, and the use of bibliographic classification systems. Examines trends and future directions of bibliographic description.

PREREQUISITES: INFO 5515.03

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6370 Records Management [Online]**

CREDIT HOURS: 3

A comprehensive introduction to the field of records and information management. Topics covered include records creation, evaluation, maintenance and control; issues relating to the maintenance, storage and disposition of records; and electronic records management.

PREREQUISITES: INFO 5515.03 or MGMT 5502.03

CROSSLISTED: MGMT 5012.03

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: MGMT 4370.03

### **INFO 6400 Knowledge Management**

CREDIT HOURS: 3

Surveys the latest knowledge Management theories and practices from information science, management, cognitive/educational psychology and computer science. Focuses on the nature of knowledge construction by examining the identification, capture, application and sharing of organizational knowledge, cognitive techniques and the technological systems that facilitate these processes.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6450 Services and Resources for Children**

CREDIT HOURS: 3

Examines the reading and viewing interests of children. Topics covered include a brief overview of developmental psychology, the history of children's literature, developing successful library programmes for children and their caregivers, building the children's library collection, and enhancing children's visual literacy.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6500 Community-Led Services**

CREDIT HOURS: 3

Students will learn how to identify the interests and needs of particular client groups, and how to integrate these needs into the ongoing operations of an information organization. Particular attention will be given to working in the community with socially excluded community members and applying the

Community-Led Library Service Model.

PREREQUISITES: INFO 5530.03

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6513 Business Analytics and Data Visualization**

CREDIT HOURS: 3

This course provides an introduction to Business Analytics and Data Visualization. It covers the processes, methodologies and practices used to transform the large amounts of business and public data into useful information to support business decision-making. Students will learn how to extract and manipulate data from these systems. They will also acquire basic knowledge of data mining and statistical analysis, with a focus on data visualization. The students will also learn to build and use management dashboards and balanced scorecards using a variety of data design and visualization tools. The course will be made up of a combination of conceptual and applied topics with classes being held in a computer lab. Technologies to be used will be focused on end-user analytics and data visualization and will include state of the art tools for self-serve business analytics

PREREQUISITES: INFO 5590.03

CROSSLISTED: BUSI 6513

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6540 Data Management**

CREDIT HOURS: 3

Introduces the theory and practice of managing data, covering technology-driven solutions to the challenges of storing, curating, and retrieving unstructured, semi-structured, and structured data. Topics include tabular data, assessing data management requirements, data models and schemas, relational database management systems, SQL, post-relational DBMSs, Big Data, and visualization.

PREREQUISITES: IT Competencies listed in Admissions Requirements

CROSSLISTED: BUSI 6516.03

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: MGMT 4540.03

### **INFO 6560 Information Resources Management**

CREDIT HOURS: 3

Examines information resources management (IRM) theories and methods, including exploration of issues associated with the information marketplace, resource evaluation and acquisition, policies, budget allocation, and vendor and user relations.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6610 Information Policy**

CREDIT HOURS: 3

Explores, in a graduate seminar setting, a range of issues currently facing information professionals and the effect of these issues on policy development. Discusses the roles of all levels of government, the private and not-for-profit sectors, and key individuals in developing policies which affect information creation, control, access, and use. Focuses on Canadian issues and includes international affairs as appropriate to the information society.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: MGMT 4611.03

### **INFO 6620 Web Design and Architecture**

CREDIT HOURS: 3

Examines the theories, techniques and processes used to create, structure, and deliver electronic text. Topics include writing and design for the web, information architecture, and document analysis for digitization. Focuses on practical experience with HTML and CSS, TEI standards, XML, and XSLT.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: MGMT 4620.03

### **INFO 6630 User Experience**

CREDIT HOURS: 3

People frequently interact with information using technical tools. This seminar-style course explores how humans perceive information, and the resulting implications on how we present usable, effective, and accessible information. Adopting a user-centered design philosophy, we will explore methods and processes for assessing, evaluating, and improving the usability of information systems.

CROSSLISTED: BUSI 6525.03

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6640 Expert Searching for Clients**

CREDIT HOURS: 3

Explores the principles and methods involved in the retrieval of information from online databases. Topics discussed include the organization and structure of online databases, the formulation of search strategies, the evaluation of the content and search interfaces of online databases, and the management of online search services.

PREREQUISITES: INFO 5515.03, INFO 5530.03

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6650 Academic Classes**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to INFO 6680.

### **INFO 6681 Geospatial Information Management**

CREDIT HOURS: 3

Spatial Information is the air and water that makes mapping and spatial analysis possible. Mobile applications using maps are some of the most popular and often used web-based applications; they are also cloud based which added another layer of management issues. Maps, GIS, and the use of spatial information have never been more popular or public. This course addresses the effective management of spatial information. The course covers principles and practices associated with metadata, GIS, licensing, spatial information databases, map libraries and archives, spatial data infrastructures and web-based delivery of products and services, as well as distributed systems such as geo-libraries, 'digital earth' and the development of the 'spatial cloud'. This course is geared towards the manager who seeks to deploy services associated with spatial information and effectively develop an enterprise approach to managing spatial information. The course will also provide hands-on experience in using GIS and related technologies so as to be able to better understand how to deploy services, especially over the web.

PREREQUISITES: INFO 5515.03

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: MGMT 4681.03

### **INFO 6682 Human Information Interaction**

CREDIT HOURS: 3

This course will examine information seeking behaviour in a variety of settings (healthcare, private and public organizations, academic institutions, etc.), individual and group information seeking and use in these contexts, and the theories and models of information seeking behaviour that explore and explain information behaviour.

PREREQUISITES: INFO 5520.03 and INFO 5530.03 (recommended)

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6700 Reading Course**

CREDIT HOURS: 3

Provide students with the opportunity to develop a specific interest in the library/information studies field by studying an aspect of a topic in greater detail than is possible within an existing course, studying an area not currently covered by the curriculum, or conducting a research study or special project.

Available by arrangement with the Director.

PREREQUISITES: MI or combined MI degree students, who have completed at least four three-credit graduate-level courses, with a grade point average of 3.3 (B+) or higher, are qualified to consider a reading course. Interested students must make an appointment with the SIM Director prior to embarking on a reading course.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6710 Reading Course**

CREDIT HOURS: 3

See INFO 6700.

### **INFO 6750 Health Sciences Literature & Information Sources**

CREDIT HOURS: 3

Introduces students to the concepts and practice of health science librarianship with particular emphasis on the various print and electronic reference sources in the health sciences.

PREREQUISITES: INFO 5530.03 (Recommended)

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6800 Archives**

CREDIT HOURS: 3

Provides an overview of the issues and practices of archival science, with emphasis on Canadian approaches. Considers principles of acquisition, arrangement, description, reference and use of archival records, along with the management of archives and the relationship between archival work and other divisions of the information professions.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6810 Managing Information Literacy Instruction**

CREDIT HOURS: 3

This course introduces selected theories and methods for managing processes designed to educate students, patrons, and clients in information research skills. Concepts covered relate to the design, implementation, evaluation, and management of instructional programs for a wide array of clients/patrons. Lectures and discussions include relevant theories of learning and a consideration of how these approaches may be effectively managed for client instruction.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6840 Content Management Systems**

CREDIT HOURS: 3

Introduces the requirements and technologies of networked content management systems. Follows the evolution of the digital content and its impact on information dissemination. Examines issues and trends influencing the development and structure of content management.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6850 Special Topics in Information Management**

CREDIT HOURS: 3

Builds on topics introduced in required courses, particularly those dealing with applications of information technology in information management. This course will take a more in-depth look at the major topics in the field. The content will change rapidly as the field progresses. Current topics include information ethics, design of usable information systems, digital media, network design, electronic communication, software lifecycle management, and design of an information-based organization.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 6860 Archives II**

CREDIT HOURS: 3

This course will consider advanced topics in archives, with an emphasis on Canadian practice. It will provide an overview of the management of archives by closely examining topics including donor relations, archival and monetary appraisal, multi-level archival description, project management, and public service.

PREREQUISITES: INFO 6800

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 9000 Thesis**

CREDIT HOURS: 6

Available by arrangement with the Graduate Coordinator. The Thesis option replaces four of the School's electives.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 9003 Thesis Continuing**

CREDIT HOURS: 0

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

### **INFO 9100 Thesis 1**

CREDIT HOURS: 3

Select this course code and number if you are a part-time thesis-option MI student.

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: INFO 9000.12, INFO 9000.6, INFO 9003.0, INFO 9200.3, INFO 9300.3, INFO 9400.3

### **INFO 9200 Thesis 2**

CREDIT HOURS: 3

Select this course code and number if you are a part-time thesis-option MI student.

PREREQUISITES: INFO 9100.3

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: INFO 9000.12, INFO 9000.6, INFO 9003.0, INFO 9100.3, INFO 9300.3, INFO 9400.3

### **INFO 9300 Thesis 3**

CREDIT HOURS: 3

Select this course code and number if you are a part-time thesis-option MI student.

PREREQUISITES: INFO 9100.3, INFO 9200.3

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: INFO 9000.12, INFO 9000.6, INFO 9003.0, INFO 9100.3, INFO 9200.3, INFO 9400.3

### **INFO 9400 Thesis 4**

CREDIT HOURS: 3

Select this course code and number if you are a part-time thesis-option MI student.

PREREQUISITES: INFO 9100.3, INFO 9200.3, INFO 9300.3

RESTRICTIONS: MI, MI/JD, MI/MPA, MI/MREM

EXCLUSIONS: INFO 9000.12, INFO 9000.6, INFO 9003.0, INFO 9100.3, INFO 9200.3, INFO 9300.3

### **MGMT 5000 Management Without Borders: A Foundation Course for Masters Students in Management**

CREDIT HOURS: 3

This course places management in its broadest context and helps students from diverse disciplines understand the complex social, economic, ecological, political, and technological forces shaping 21st century leadership in the public, private and non-profit sectors. Key themes explored in the course include systems thinking, responsible leadership, sustainable economic development, stakeholder theory, risk management and knowledge management. A significant portion of the course is devoted to interdisciplinary / inter-professional group work. Students from different programs are brought together to work with a Nova Scotia organization that has identified a relevant and timely project topic for the group. The project provide students with the opportunity to hone important skills in team dynamics, interpersonal communication, project management, managing scope and ambiguity, information gathering, research and writing professional reports. The course is team taught by leading faculty from across the Faculty of Management as well as guest speakers. Learning opportunities are delivered in a mix of formats, including lectures, tutorials, readings, multidisciplinary cases, and group discussions.

FORMATS: Lecture | Tutorial

## **Interdisciplinary PhD Program**

Location:

Henry Hicks Academic Administration Building

6299 South Street

Room 314

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-8078

Fax Number: (902) 494-8797

## Staff

**Director and Graduate Coordinator**  
Robinson, L.

**Graduate Secretary**  
Nguyen, P.

## Information for Prospective Students

The Interdisciplinary PhD Program is a full-time research-based program designed to meet the needs of an increasing number of mature, experienced students for research opportunities which cut across disciplinary boundaries. Interdisciplinary research integrates the insights of two or more disciplines to advance knowledge and solutions beyond the scope of a single discipline. Within the program's framework, the program of study is customizable to the needs of the student and their research direction. Students take graduate courses across Faculties at Dalhousie and work with faculty members in existing PhD-granting disciplines and other areas. They then complete a set of comprehensive examinations, defend a PhD thesis proposal, and then complete and defend an original research program leading to the doctoral thesis.

Applicants for the program must have demonstrated prior academic excellence. Before applying, prospective students must consult with faculty members in the disciplines relevant to their proposed research program. Particular attention should be paid to the following features of the Interdisciplinary PhD program:

1. Entering students must hold a thesis-based Master's degree or equivalent independent research experience as demonstrated through first-authored publications etc. The cumulative GPA must be 3.7 or greater.
2. The responsibility largely lies with students to organize a unique, genuinely interdisciplinary program of studies with identified supervisor(s) and supervisory committee. The supervisory committee must be fully identified by the second stage of the program's admissions process.
3. Doctoral programs are designed to produce graduates who are capable of acting as independent investigators. Within that model of increasing independence, the supervisory committee is responsible for defining and supervising the student's overall program of study, including advice on funding, setting, and scheduling of comprehensive examinations, the development of a thesis proposal, the research program, thesis-writing and defence.
4. Students should plan their program of study in the context of an overall career goal to ensure that, as far as possible, an appropriate qualification is developed for desired employment upon graduation.

The admissions process for the Interdisciplinary PhD is a three-stage process consisting of: (i) evaluation of academic credentials, (ii) evaluation of interdisciplinary research interests, supervision, and planning, and (iii) applicant interviews. Anyone wishing to pursue admission to the program should plan it within the framework of the following admission process.

1. The student should develop, in consultation with at least one faculty member, a tentative program of proposed study, making sure that it: (a) is truly interdisciplinary, and (b) cannot be completed within the framework of a single discipline.
2. The student, in consultation with the potential supervisor, should prepare a Statement of Interdisciplinary Research Interest.
3. The student should discuss the proposed program with appropriate faculty members and obtain written support from a supervisor and two committee members.
4. The application process is described in detail on the Web at: <http://idphd.grad.dal.ca/>. Please see that website for details on the documents required for a full application, including transcripts, Statement of Interdisciplinary Research Interest, program proposal, three letters of reference, letters of support from proposed supervisor and committee members, and other supporting documentation. Please also see the program website [www.idphd.grad.dal.ca](http://www.idphd.grad.dal.ca) for application deadlines.

Because the application process is a lengthy one, prospective students are advised to plan well in advance. Application for external funding by all eligible applicants is strongly advised. Limited university funding may be available.

## Admission Deadlines

Deadlines are February 1 for September start, or October 1 for a January or May start.

## Program Requirements

Preliminary course work will generally consist of 12 to 18 credit hours chosen from the graduate offerings of the Faculty and may include up to two directed reading courses. During the second year, comprehensive examinations are written in fields appropriate to the topic of research. The number (no more than three) and nature (written, oral, combination of written and oral, or project-based) are decided by the supervisory committee. Soon after comprehensives are passed the student submits a written thesis proposal to the supervisory committee. After successfully defending the written proposal, the student works exclusively on the research program leading to the thesis. The finished thesis is presented and orally defended in compliance with the Faculty of Graduate Studies procedures.

For more information contact:

### Faculty of Graduate Studies, Dalhousie University

Room 314, Henry Hicks Academic Administration Building  
6299 South Street | PO BOX 15000  
Halifax, NS B3H 4R2, Canada

Telephone: (902) 494-8078

Fax: (902) 494-8797

Email: [jdphd@Dal.Ca](mailto:jdphd@Dal.Ca)

Website: [jdphd.grad.dal.ca](http://jdphd.grad.dal.ca)

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### INTE 7000 Interdisciplinary Directed Studies

CREDIT HOURS: 3

### INTE 7005 Research Directed Studies

CREDIT HOURS: 3

The purpose of this course is to provide all Interdisciplinary PhD students with an opportunity within their programs to concentrate on the development of a research proposal. Normally, the student would read broadly, prepare a bibliography of related work, prepare critical analyses of current work, and meet with the supervisor on a weekly basis. Each instance of this course would, however, be designed by the student and his or her supervisor to reflect the interdisciplinary nature of the individual program. The goal of this directed study course is for the student to formulate research questions that may be developed into the formal research proposal. The course would entail both written and oral contributions by the student.

### INTE 9530 Doctoral Thesis

CREDIT HOURS: 0



# International Development Studies

## Location:

Marion McCain Building  
6135 University Avenue  
Room 3038  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3814  
Fax Number: (902) 494-2105  
Email Address: [idsgrad@dal.ca](mailto:idsgrad@dal.ca)  
Website: [www.dal.ca/ids](http://www.dal.ca/ids)

## Staff

### Chair of Department

**Ulicki, T.**, BA (McGill), MA (St. Mary's), PhD (Sussex)

### Graduate Coordinator

**Schnurr, M.**, BSc (Hon) (Queen's), MA (School of Oriental and African Studies, London UK), PhD (UBC)

### IDS Faculty

**Cameron, J.**, BA (Dalhousie), MA (Simon Fraser), PhD (York)

**Huish, R.**, BA, MA (Queen's), PhD (Simon Fraser)

**Mannathukkaren, N.**, BA (Bangalore), MA, MPhil (Jawaharlal Nehru), PhD (Queen's)

**Parasram, A.**, BA (Dalhousie), MA, PhD (Carleton)

**Schnurr, M.**, BSc (Hon) (Queen's), MA (School of Oriental and African Studies, London UK), PhD (UBC)

**Ulicki, T.**, BA (McGill), MA (St. Mary's), PhD (Sussex)

### Professor Emeritus

**Parpart, J. L.** (International Development Studies/History)

### Cross-Appointed Faculty

**Adams, M.** (SRES)

**Arthur, P.** (Political Science)

**Black, D.** (Political Science, International Development Studies)

**Chircop, A.** (Law/Marine Affairs)

**DuBois, L.** (Sociology and Social Anthropology)

**Fierlbeck, K.** (Political Science)

**Finbow, R.** (Political Science)

**Fitting, E.** (Sociology and Social Anthropology)

**Gahagan, J.** (School of Health and Human Performance)

**Harvey, F.** (Political Science)

**Hayden, A.** (Political Science)

**Jackson, L.** (School of Health and Human Performance)

**Karabanow, J.** (School of Social Work)

**Kirk, J.** (Spanish)

**Manning, E.** (School of Social Work)

**Mbakogu, I.** (School of Social Work)

**Mopoho, R.** (French)

**Noble, B.** (Sociology and Social Anthropology)

**Oakley, R.** (Sociology and Social Anthropology)

**Scherkoske, G.** (Philosophy)

**Waldron, I.** (Nursing)  
**Wright, T.** (Environmental Programs)  
**Zachernuk, P.** (History)

### **Adjunct (FGS)**

**Baillie Abidi, C.**  
**Bezerra, M.**  
**Chung, R.**  
**Darnell, S.**  
**Den Heyer, M.**  
**Donnelly, G.**  
**Ervine, K.**  
**Fridell, G.**  
**Khasnabish, A.**  
**Langdon, J.**  
**McAllister, R. I.**  
**McKague, K.**  
**Musoke, S.**  
**Parpart, J.**  
**Theunissen, S.**  
**Tiessen, R.**  
**Tomlinson, B.**  
**Wright, D.**

## **Application and Admission**

Candidates for admission to the Masters degree in International Development Studies should hold an honours degree or equivalent, from a university of recognized standing, in either International Development Studies or a relevant discipline (including, for example, business, economics, environmental studies, history, law, political science, public administration, or sociology and social anthropology) or have completed at least four senior undergraduate courses in one of these disciplines. All candidates for admission must meet the requirements of the Faculty of Graduate Studies.

Some candidates may complete the requirements in a 12-month period of full-time study. In most cases, however, completion of the degree will take more than the 12-month period and will involve payment of continuing fees for any additional academic terms of registration.

Application forms, available online, should be returned along with supporting documents, including an example of written work, a statement of educational and professional goals and a CV, by April 1 for overseas applicants and June 1 for North American applicants at the very latest. Early application is especially recommended for foreign candidates who will need to arrange student visas, e.g., by January 31. Students wishing to be considered for scholarship support are strongly encouraged to submit completed applications before January 5th.

Candidates from outside Canada whose native language is other than English must demonstrate their capacity to pursue a Masters program in English. They should submit the results of a TOEFL or other standard English competency test at the time of application. The minimum TOEFL score required is 580 (internet based TOEFL score required is 92).

## **Program Requirements**

Candidates for the Master's Degree in International Development Studies are expected to complete a course of study at the graduate level worth at least 30 credit hours; normally 15 credit hours by course work and 15 credit hours by thesis. Part-time students may complete the requirements over a three-year period. The thesis will conform to graduate studies regulations and will normally be presented and examined orally in public.

## **Master of Arts (MA)**

**An interdisciplinary Masters degree by course work and thesis which focuses on problems of and prospects for development in the countries and communities of the global South.**

The program brings together Dalhousie's considerable resources in development studies - individual, institutional, and informational. We offer an innovative degree program based on established graduate courses. In addition to core courses and faculty in International Development Studies, the degree draws heavily, though not exclusively on courses and supervisors in Economics, History, Political Science and Sociology and Social Anthropology. It is offered by the Faculty of Graduate Studies through the International Development Studies Department and has limited enrollment per annum.

This degree exists as an interdisciplinary offering with the following requirements:

1. three credit hours in theory
2. three credit hours in methods
3. Out of the 15 credit hours at least three credit hours should be taken in different discipline
4. The Masters thesis counts as 15 credit hours;
5. Thesis committee members can be drawn from IDS core faculty, cross-appointees, adjunct professors, or other Dalhousie faculty members. One of the three committee members may come from outside of Dalhousie.

## **IDS Approved Courses from Other Departments**

NOTE: Some of these courses may require prerequisites: see departmental rules. Not all courses are offered every year. Please consult individual department/school entries for course descriptions.

### ***Biology***

BIOL 5060.03: Environmental Ecology  
BIOL 5065.03: Sustainability and Global Change  
BIOL 5160.03: Political Ecology

### ***Business Administration***

BUSI 6255.03: Global Markets and Institutions

### ***Economics***

ECON 5252.03: From Disaster Relief to Development  
ECON 5516.03: Resource Economics I  
ECON 5517.03: Environmental Economics II  
ECON 5522.03: Labor Economics I

### ***English***

ENGL 5651.03: Indigenizing Modernism  
ENGL 5700.03: South African Literature in a Century of Struggle  
ENGL 5919.03: Postcolonial Studies in the New Millennium

### ***Environmental Studies***

ENVI 5031.03: Economics for Resource and Environmental Management  
ENVI 5035.03: Research Design and Methods  
ENVI 5041.03: Environmental Education  
ENVI 5204.03: Coastal Zone Management  
ENVI 5500.03: Socio-political Dimensions of Resource and Environmental Management  
ENVI 5504.03: Management of Resources and the Environment

### ***Gender and Women's Studies***

GWST 6010.03: Theories of Feminism  
GWST 6020.03: Feminist Methodologies

### ***History***

HIST 5400.03: Topics in African History  
HIST 5430.03: The Making of Colonial Africa (1850-1930)  
HIST 5435.03: Rise and Fall of African Slavery  
HIST 5452.03: South Africa Since 1860

HIST 5401.03: State Violence, Communal Conflict and Criminality in Modern Africa  
HIST 5404.03: Crime and Punishment in Modern Africa  
HIST 5431.03: Struggle in the city: Labour, Migration and Urban Life in Colonial Africa  
HIST 5510.03: Topics in Islam and Middle East History  
HIST 5545.03: Scripture and State Craft: The History of Islamic Political Thought (7th - 21st centuries)  
HIST 5470.03: Wars & Revolutions in 19th Century Africa  
HIST 5471.03: Wars & Revolutions in 20th Century Africa  
HIST 5475.03: African Intellectuals and the Modern Experience

### ***Law***

LAWS 5022.03: Law of the Sea  
LAWS 5051.03: International Environmental Law  
LAWS 5056.03: International Trade Law  
LAWS 5068.03: Ocean Law and Policy: International Fisheries  
LAWS 5200.03: Environmental Law

### ***Marine Affairs***

MARA 5001.06: Contemporary Issues in Ocean Management and Development  
MARA 5003.03: Marine Science and Technology  
MARA 5008.03: Integrated Maritime Enforcement  
MARA 5009.03: Coastal Zone Management  
MARA 5021.03: Fisheries Management  
MARA 5589.03: Politics of the Sea

### ***Nursing***

NURS 5110.03: Qualitative Research: Learning Grounded Theory  
NURS 5140.03: Community-Based Research Methodologies for Addressing Health Disparities  
NURS 5550.03: Marginalized Populations: Theoretical Insights and Applications

### ***Political Science***

POLI 5302.03: Comparative Development Administration  
POLI 5303.03: Human Rights and Politics  
POLI 5315.03: African Politics  
POLI 5340.03: Approaches to Development  
POLI 5345.03: Politics of Southern Africa  
POLI 5350.03: Governance and Globalization  
POLI 5360.03: Politics of Latin America  
POLI 5475.03: Democratic Theory  
POLI 5531.03: UN in World Politics  
POLI 5535.03: New International Division of Labor  
POLI 5537.06: Management and Conservation of Marine Resources (Summer Only)  
POLI 5540.03: Foreign Policies in the Third World  
POLI 5560.03: Human Development/Security at the Start of the Twenty-first Century  
POLI 5581.03: Diplomacy and Negotiation  
POLI 5585.03: Politics of the Environment

### ***Public Administration***

PUAD 6500.03: Business and Government  
PUAD 6520.03: Program Evaluation Seminar  
PUAD 6521.03: Program Evaluation Practicum  
PUAD 6550.03: Design and Use of Projects  
PUAD 6555.03: The Impact of Technology and Public Administration  
PUAD 6620.03: Women, Men and Management

### ***Social Work***

SLWK 6333.03: Practice Research  
SLWK 6365.03: Community Socio-Economic Development  
SLWK 6385.03: Community and Social Change Analysis  
SLWK 6390.09: The Theory and Practice of Community Work

### ***Sociology and Social Anthropology***

SOSA 5001.03: Survey Methods

SOSA 5002.03: Social Statistics

SOSA 5003.03: Contemporary Perspectives in Ethnography

SOSA 5004.03: Advanced Issues in Work, Industry, and Development

SOSA 5005.03: Advanced Issues in Social Injustice and Social Inequality

SOSA 5006.03: Advanced Issues in Health and Illness

### ***Urban and Rural Planning***

PLAN 5101.03: History and Theory of Planning

PLAN 5102.03: Planning Practice

PLAN 5103.03: Qualitative Methods

PLAN 6101.03: Urban Design

PLAN 6102.03: Urban Economics

PLAN 6103.03: Urban Ecology

PLAN 6104.03: Comparative Urbanization

PLAN 6106.03: Transportation Planning

PLAN 6107.03: Regional Planning

PLAN 6110.03: Environmental Impact Assessment in Social and Environmental Policy

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## **Course Descriptions**

### **INTD 5000 Advanced Topics in International Development Studies**

CREDIT HOURS: 3

A course on a particular aspect of international development taught only by special arrangements between individual IDS students and individual instructors associated with the program. The course is available in Summer as well as in the regular academic sessions

CALENDAR NOTES: Students taking this course must register in and complete the Fall and Winter in the same Academic year to receive credit. Students will receive a grade of IP each term until all course requirements are completed.

FORMATS: Tutorial

### **INTD 5001 Readings in International Development Studies**

CREDIT HOURS: 3

A reading course on a particular aspect of international development taught only by special arrangements between individual IDS students and individual instructors associated with the program. The course is available in Summer as well as in the regular academic sessions.

FORMATS: Tutorial

### **INTD 5002 Graduate Seminar in Research Design for Development Studies**

CREDIT HOURS: 3

This course is designed to help the student to learn from a variety of research case experiences - drawing upon readings, case studies, meetings with experienced researchers and, as the year progresses, sharing their research interests and findings. It is designed to support the student in the preparation of their thesis proposals.

FORMATS: Seminar

### **INTD 5003 Special Topics in INTD I**

CREDIT HOURS: 3

A course on a particular aspect of international development taught only by special arrangements between individual IDS students and individual instructors associated with the program. The course is available in Summer as well as in the regular academic sessions.

FORMATS: Tutorial

### **INTD 5004 Special Topics in International Development Studies II**

CREDIT HOURS: 3

A class on a particular aspect of international development taught by special arrangement between individual IDS Graduate Student(s) and individual instructors associated with the International Development Studies Department. The course is available in Summer as well as in the regular academic sessions.

PREREQUISITES: Undergraduate degree

FORMATS: Lecture

### **INTD 5006 Development and the Philosophy of Social Science**

CREDIT HOURS: 3

This course is intended to serve as an initial step in undertaking research in development studies. Development cannot be studied without understanding how we construct knowledge about social phenomena. Therefore, development, in particular, and the social science, in general, are intrinsically connected to philosophy. While we have come across a wide variety of theories about development, it is imperative that we step back and analyze the philosophical and theoretical assumptions about knowledge that inform these theories. Similarly, research is not only about devising the correct methodologies, but also about uncovering the epistemology (ways of knowledge) behind the different methodologies. Once we have a sense of these assumptions, it becomes easier to choose our own frameworks and methodologies in studying development, whether in the archives, or in the field.

### **INTD 5007 Environment and Development**

CREDIT HOURS: 3

This seminar investigates the intersections between environmental science and development science. Our primary focus will be to understand how the non-human environment impacts and constrains development interventions, both in the past and the present. Topics to be covered include agriculture and pastoralism, biodiversity and conservation, agricultural biotechnology, climate change, and environmental security.

FORMATS: Seminar

### **INTD 5010 Global Citizenship in Theory and Practice**

CREDIT HOURS: 3

The question of global citizenship lies at the core of what International Development Studies is all about: critically examining causes of global poverty, inequality, and injustice – and the ethical obligations which these issues pose for all human beings. Questions about our ethical obligations to other human beings – especially those who are very poor and very far away – have persisted in debates among philosophers and ordinary people for centuries. The idea of global citizenship – also often referred to as cosmopolitanism – dates back to ancient Greece and has been an ongoing focus of debate since then. At its core are a series of fundamental questions that have particular importance in the context of the challenges of the twenty-first century – such as economic globalization and climate change: What basic rights do all human beings possess? What ethical obligations do those rights imply for other humans? What specific actions do those ethical obligations require us to undertake? This course examines both the ethical obligations which global citizenship suggests and the ways in which people might fulfil those obligations in practice.

EXCLUSIONS: INTD 4403.03

FORMATS: Lecture

### **INTD 5011 Development as Modernity and Modernity as Development**

CREDIT HOURS: 3

Development as we understand today is a definite product of the modern condition. Therefore, we cannot understand development unless we understand modernity. But often this relationship is obscured when development is discussed. This course will seek to make sense of modernity and its inter-linkages with development. After looking at some classical understandings of modernity, we will examine the lacunae in such understandings. The way in which actual historical processes of development actualize or subvert the ideal-typical notions of modernity will also be examined. Finally, we will dwell upon the attempts to resist modernity and imagine possibilities that are hitherto not part of the horizons of modernity. Here the debate will be about if it is actually possible to go beyond modernity and inaugurate new understandings of development or are these attempts radicalizing the original intent of modernity.

CALENDAR NOTES: Previously offered as Special Topics - INTD 5009 - Development as Modernity and Modernity as Development

EXCLUSIONS: INTD 4014.03

FORMATS: Lecture

## **INTD 5600 Gender and Development**

CREDIT HOURS: 3

The primary aim of this seminar course is to provide a broad foundation to some of the theoretical perspectives which have informed and shaped current thinking in gender and development. The course introduces students to key concepts in the analysis of social relations between women and men in different cultural, economic, and political contexts.

## **INTD 9000 Master's Thesis**

CREDIT HOURS: 0

# **Internetworking**

Location:

1360 Barrington Street

Room A208, 2nd floor

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-1114

Fax Number:

Email Address: [internet.eng@dal.ca](mailto:internet.eng@dal.ca)

Website: [internetworking.engineering.dal.ca](http://internetworking.engineering.dal.ca)

## **Introduction**

Internetworking is an area of growing significance and importance in today's world. It is a multidisciplinary area which requires knowledge and skills in the related areas of engineering, communications, mathematics and modeling, computer and network architectures, and computer software. It is an industry that draws on interdisciplinary knowledge, requires practical ability, and capitalizes on individual strengths.

The Master of Engineering in Internetworking was introduced in 1997 as the first graduate program in the world dedicated to Internetworking. The Internetworking Program is a specialized course-based graduate degree program which prepares students to enter industry in the field of Internetworking. Students receive a solid theoretical education that delivers the underlying theory of the Internet, how it works, how to design LAN's, WAN's, and inter and intra nets. It also covers security, management, and protocols that are used on the Internet. Practical skill development is a key component of this program and is achieved through the intensive laboratory requirements.

The program is designed to allow students to apply their knowledge and develop hands-on experience in a unique environment where they can analyze, test, and integrate their knowledge, concepts and ideas through interactive learning. Through collaborative group work in the Internetworking laboratories, students have the opportunity to develop the team skills which are highly valued in industry.

## **Program Courses**

The courses are continually under review and are shown here as they were at the time of going to press. The order of presentation is updated regularly on the Program Web page. Students are required to take courses in the pre-requisite order given on the Program Web page. A project is not mandatory, and registration requires departmental approval.

Any new proposed courses will be posted on the program Website once approved by the university. In addition to courses, all students are required to research and present a seminar on an Internetworking topic. Registration is required for the seminar.

**NOTE:** Completion of any or all engineering courses offered by the Department does not qualify persons to hold the designation "Professional Engineer" as defined by various Provincial Acts governing the Engineering Profession.

# Staff

## Program Director

**Robertson, W.**, BSc (Eng Hons), MSc (Aberdeen), PhD (TUNS), PEng

## Instructors

**Ilow, J.**, BSc (Poland), MSc, PhD (Toronto)

**Srinivas, S.**, BEng (Bangalore), PhD (Inst. of Science, Bangalore)

# Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

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# Course Descriptions

## INWK 6000 Program Continuance

CREDIT HOURS: 0

## INWK 6111 Introduction to Computer Networks

CREDIT HOURS: 5

This course offers a general introduction to computer networks. It explores the structure, goals, services, and problems of computer networks. The structure of computer communications is examined using the Open Systems Interconnection (OSI) seven-layer protocol model. The purpose of each layer is discussed from both conceptual and practical aspects, and data communication standards are examined in terms of their layered structures. The distinction between circuit and packet switching is highlighted, and client server distance applications are discussed.

EXCLUSIONS: EINE 5101.03, INWK 5101.03, 6101.03

## INWK 6112 Physical and Datalink Standards and Protocols

CREDIT HOURS: 5

This course covers issues relating to the physical and datalink layers of data communications networks. A review of basic digital communication theory is given, including modulation and demodulation techniques and their performance in noise and under bandwidth constraints. Physical layer standards of several wireline-based protocols are examined, and optical and wireless channels are also considered. Media access control techniques, framing structures, and error control procedures of several protocols are investigated.

EXCLUSIONS: EINE 5102.03, INWK 5102.03, 6102.03

## INWK 6113 Telecommunication and Wide-Area Networks

CREDIT HOURS: 5

This course presents an overview of the technologies used in present telecommunications systems and wide area networks. Standard telecommunication transport and signalling standards are introduced. The Integrated Services Digital Network and broadband access alternatives are discussed. Wireless standards for cellular and satellite systems are considered, and emerging personal communication services are introduced.

EXCLUSIONS: EINE 5103.03, INWK 6103.03

## INWK 6114 Internet Communication Protocols

CREDIT HOURS: 5

This course provides an in-depth coverage of the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol stack suite, including IP and protocols for address resolution, internet control, routing, broadcasting, and multicasting. End-to-end communication issues associated with TCP will be discussed.



Network management and domain name systems will be covered. Applications including telnet, file transfer, and simple mail transfer protocols will be covered in detail.

EXCLUSIONS: EINE 5104.03, INWK 5104.03, 6104.03

### **INWK 6115 Network Architecture**

CREDIT HOURS: 5

This course covers the design of network architecture protocols the placement of servers and monitors, and firewalls. Internetworking, bridging, routing, and encapsulation are covered. Algorithms for bridging and routing are examined.

EXCLUSIONS: EINE 5105.03, INWK 5105.03, 6105.03

### **INWK 6117 Emerging Internetworking Technologies**

CREDIT HOURS: 5

The primary focus of this course is to provide a comprehensive coverage of the major developments that lay the foundation for the next generation high performance networks. The student will study, the emerging technologies, design alternatives, and the underlying theory and practice required for the Internet to grow beyond a best effort data delivery service to become a reliable and multi-service environment.

EXCLUSIONS: INWK 5107.03, 6107.03

### **INWK 6119 Network Security**

CREDIT HOURS: 5

The primary objective of this course is to provide a comprehensive coverage of the theory, concepts, design principles and technologies for network security. The course focuses on the design principles and techniques of two major aspects of network security: (a) how to secure a network; and (b) how to secure data transactions.

### **INWK 6211 Mathematics for Internetworking**

CREDIT HOURS: 5

This course includes a review of Probability and Statistics, data collection and distribution fitting. Markov chains, reliability, Markov Chains, stochastic processes and queuing systems, random number generators, sampling from various probability distributions, Monte Carlo simulation.

EXCLUSIONS: EINE 5201.03, INWK 5201.03, 6210.03

### **INWK 6312 Programming for INWK**

CREDIT HOURS: 5

Topics covered include objects, stacks, queues, simple and multiple linked lists, searching and sorting algorithms, and their implementation. The students implement numerical methods, and message passing applications related to internetworking, while learning to design structured programs.

### **INWK 6411 Real Time Programming for Internetworking**

CREDIT HOURS: 5

The objective of this course is teaching the student the fundamentals of real time programming for internetworking. Topics covered include message queuing, resource sharing, priority assignments, event flags, interrupts, device handling, and protocol stack techniques.

EXCLUSIONS: EINE 5401.03, INWK 5401.03, 6401.03

### **INWK 6800 Internetworking Seminar Topic**

CREDIT HOURS: 0

Students are required to research and present a seminar on an Internetworking topic.

FORMATS: Seminar

### **INWK 6801 Internetworking Seminar Continuance**

CREDIT HOURS: 0

Students are required to research and present a seminar on an Internetworking topic.

FORMATS: Seminar

### **INWK 6900 Project Continuance**

CREDIT HOURS: 0

EXCLUSIONS: INWK 5900.00

### **INWK 6911 Project**

CREDIT HOURS: 5

The student will be required to analyze the performance of a network and either design a new network or an upgrade to an existing network. The project should preferably be undertaken with an industrial company.

EXCLUSIONS: EINE 5901.03, INWK 5901.03, 6901.03

### **INWK 6912 Network Design**

CREDIT HOURS: 5

The objective of this course is to provide a solid foundation for the design of networks with comprehensive security. The course focuses on the design principles and techniques for total network design from initial planning to management issues.

## **Interprofessional Health Education**

Location:

Burbidge Building  
5968 College Street  
3rd floor  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3327

Fax Number: (902) 494-1966

Email Address: [health@dal.ca](mailto:health@dal.ca)

Website: [www.dal.ca/faculty/health.html](http://www.dal.ca/faculty/health.html)

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## **Courses**

**Open to all Dalhousie students:**

IPHE 5100: A Multidisciplinary Course in Addiction Studies

**Required for students in the schools below:**

IPHE 5900: Interprofessional Health Education Portfolio

Students must ensure they are registered in the correct section with their school/college.

Health Administration

5900.00 - section 1

Human Communication Disorders	5900.00 - section 2
Occupational Therapy	5900.00 - section 3
Physiotherapy	5900.00 - section 4
Clinical Vision Science	5900.00 - section 5

## Course Descriptions

### **IPHE 5100 A Multidisciplinary Course in Addiction Studies**

CREDIT HOURS: 3

This is a multidisciplinary graduate-level course for students and professionals interested in addictions. The field of addictions is by nature multi-disciplinary and touches on aspects of health, sociology, psychology, psychiatry, social work, pharmacology, toxicology, international policy, and other disciplines. This course will provide students with core knowledge and understanding of different behavioural, biological, historical, medical, and socio-cultural aspects of addictions. It will also provide information about the etiology of addictions and contemporary approaches to prevention and treatment.

RESTRICTIONS: None. Open to all Dalhousie University graduate students.

FORMATS: Lecture | Seminar | Discussion

### **IPHE 5900 Interprofessional Health Education Portfolio**

CREDIT HOURS: 0

This course is intended to prepare students to work in collaborative and patient/client/community/family-centered work environments. Students in entry-to-practice graduate programs are required to maintain registration in this course for the duration of their studies. The student will be required to have completed, by the end of their program of study, a total number of different meaningful and relevant interprofessional collaborative learning experiences (as determined and approved by the School/College) equal to two times the number of years or part years of study in the program. At least one of these experiences will be in a practice setting (which could include a simulated practice setting). In the event there are no students from other professions in any of the student's practice settings, credit may be granted for interactions with non-student professionals that follow an approved structured format. The experiences will include interactions with undergraduate and/or graduate students from a total of at least four different related professions with which there are natural affinities or linkages in the professional environment, some professions of which are outside the student's home School/College. In accordance with the guidelines/requirements of the home School/College, students will prepare a portfolio (or comparable document/process) that maps their interprofessional collaborative learning experiences on to the specific requirements of the School/College. The portfolio will be graded by the School/College on a Pass/Fail basis. Successful completion of this course is a requirement for graduation in all programs and will be recognized further with the awarding of a special Certificate in Interprofessional Collaboration to be presented by the Faculty of Health.

RESTRICTIONS: Faculty of Health students only

## Journalism

Location:

University of King's College  
Arts & Administration Building, 3rd floor  
6350 Coburg Road  
PO BOX  
Halifax NS  
B3H 2A1

Phone Number: (902) 422-1271 ext. 159

Fax Number: (902) 423-3357

Email Address: [jour@dal.ca](mailto:jour@dal.ca)

Website: [www.ukings.ca/journalism](http://www.ukings.ca/journalism)

## Staff

### **Director**

Currie, T., BA (Queen's), BJ (King's), MA (Alta)

### **Department Administrator**

Porter, K.

## **Executive Director (MFA)**

**Pittaway, K.**, BJ (Carleton), MFA (Goucher)

## **Professors**

**Jobb, D.**, BA Hons (Mt. A), MA (Saint Mary's)

**Kimber, S.**, MFA (Goucher)

**Kierans, K.**, BA (King's), MA (Saint Mary's)

## **Associate Professors**

**Toughill, K.**, BA (San Francisco State Univ), MBA (Queen's)

**Vallance-Jones, F.**, BJ Honours (Carleton), MEd (MSVU)

## **Assistant Professors**

**Currie, T.**, BA (Queen's), BJ (King's), MA (Alta)

**Newhook, S.**, BAA (Ryerson), MA (Dalhousie)

**Swick, D.**, BA (Skidmore), MFA (Goucher)

**Tailleur, T.**, BA (Alta), BJ (King's), MJ (Dalhousie/King's)

## **Adjunct (FGS)**

**Pittaway, K.**, BJ (Carleton), MFA (Goucher)

## **Instructors**

**McKie, D.**, BJ (Carleton) MJ (Carleton)

**Moore, E.**, BJ (Ryerson), MA (Orebro)

# **Admission Requirements**

## **Master of Journalism**

Applicants must have a Bachelor's degree from an accredited university, with an average minimum grade of B or better.

International students must meet the same criteria as Canadian students. The Journalism Admissions Committee takes into account the applicant's academic record, published articles and media files, extracurricular activities, and other evidence of interest in journalism. Previous journalism experience is not essential.

Applicants with an undergraduate degree in journalism, or deep experience as a working journalist, can apply to join the MJ program in January of the first year. Applicants who do not have a Bachelor of Journalism degree, but who have a degree in another discipline and extensive experience working as a journalist may be admitted using a prior learning assessment process.

## **Master of Fine Arts in Creative Nonfiction**

Applicants must have obtained an undergraduate degree -normally an honours degree- in any discipline with an average grade of B or better and must submit a portfolio of nonfiction writing with their application. Prospective students should include with their submission a description of the idea or ideas they want to pursue as their major creative nonfiction project.

A prior learning assessment process will be available for the few otherwise outstanding applicants who do not have an undergraduate degree or whose degree is more than 10 years old and whose average grade in that degree was not B or better.

# **Master of Journalism (MJ)**

## ***Two-Year Master of Journalism***

The Master of Journalism offered jointly by Dalhousie University and the University of King's College prepares students to tell in-depth, evidence-based stories to the public. The degree focuses on storytelling, reporting practice and methods of journalism research. Graduates will have the skills to enter a newsroom or any field that requires advanced analytical and communication skills.

This full-time two-year program begins in September each year. It has 54 credit hours, divided as follows:

Fall (Year 1) 21 hours

Winter 12 hours

Summer 3 hours

Fall (Year 2) 9 hours

Winter 3 hours

Electives to be taken during program: 6 hours

Students begin the program with an introduction to standards of ethical and legal conduct, alongside research, interviewing and storytelling skills in audio, video, and text. They sharpen their journalism skills in text and images by completing a workshop in news reporting for online platforms.

As they progress through the program, they delve into advanced research skills, data journalism techniques and contemporary issues in the profession. They learn visual storytelling methods and gain an understanding of the business environment for journalism while taking two electives to build their subject matter expertise.

In their second year, students will complete a professional project under the supervision of faculty. This research-intensive, visually compelling feature demonstrates the student's ability to explore an important story in the public interest. The professional project is a significant component of the degree requirement and the centerpiece of the student's portfolio.

The degree also includes an option of admission in January of Year 1 for applicants who have a journalism degree or deep work experience in the field.

Visit the Faculty of Graduate Studies website at [dalgrad.dal.ca](http://dalgrad.dal.ca) and/or the School of Journalism website at [ukings.ca/mj](http://ukings.ca/mj) for more information.

## Master of Fine Arts (MFA) in Creative Nonfiction

The Master of Fine Arts in Creative Nonfiction provides students with the opportunity to understand the history, craft, art and issues involved in creative nonfiction writing; explore new and evolving publishing models; and work one-to-one with faculty and professional nonfiction writer-mentors to develop polished book proposals and manuscripts. Students will graduate with a professional book proposal and a substantial portion of a book-length creative nonfiction manuscript.

The two-year limited residency program is delivered over 24 months.

The program begins with an intensive nine-day on-site summer residency at King's where students will attend lectures, seminars, workshops, and readings, and choose the subject of their master's writing project as well as begin working with their first mentors.

During the fall semester, students will work one-to-one with their assigned mentors. Students are expected to complete their book proposals by the end of the fall semester. They will also undertake readings and assignments, and participate in online discussions as part of Writing Craft I.

In January, students will convene for a one-week residency in Toronto or New York (alternating years), where they will meet with professional publishers, editors, agents, and experts in publishing and related fields.

One-to-one work on their book proposals and manuscripts will continue with assigned mentors in the spring semester.

During their second year, students will once again convene in Halifax for another nine-day summer residency where they will attend lectures, seminars, workshops and readings, work with their third- and fourth-semester mentors and then continue their writing and online studies throughout the fall.

During their fourth and final semester, students will - in addition to participating in their winter residency - complete their manuscript requirement with the guidance and assistance of their mentor and faculty supervisor.

Visit the Faculty of Graduate Studies website at <http://www.dalgrad.dal.ca> and/or the School of Journalism website at [www.ukings.ca/journalism](http://www.ukings.ca/journalism) for more information.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

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## Course Notes

### Master of Journalism

JOUR 6151.03 Journalism Research  
JOUR 6153.03 Reporting Fundamentals  
JOUR 6156.03 Writing and Reporting for Audio and Video  
JOUR 6709.03 Journalism & Society  
JOUR 6857.09 News Workshop  
JOUR 6702.06 Advanced Reporting  
JOUR 6703.03 Professional Journalism Environment  
JOUR 6705.03 Data Journalism Methods  
JOUR 6706.03 The Evolving Business of Journalism  
JOUR 6704.03 Visual Storytelling  
JOUR 6800.03 Professional Project

### Master of Fine Arts in Creative Non-Fiction

JOUR 6100.03: Writing Craft I  
JOUR 6101.06: Mentorship I  
JOUR 6102.03: Publishing I (Toronto)  
JOUR 6103.06: Mentorship II  
JOUR 6200.03: Writing Craft II  
JOUR 6201.06: Mentorship III  
JOUR 6202.03: Publishing II (New York)  
JOUR 6203.06: Mentorship IV

## Course Descriptions

### JOUR 5960 Online Features Workshop

CREDIT HOURS: 9

Longform journalism brings depth, engaging storytelling, and compelling images to the world of digital news. In this workshop, students research, write and photograph a major feature on an important local issue for publication online in The Signal, and work as a team to edit, produce and promote their work through social media. Students also explore the magazine industry and freelance writing opportunities.

### JOUR 6100 Writing Craft I

CREDIT HOURS: 3

Students will attend lectures, panels, and seminars, meet in small groups and one-to-one with their first mentors to finalize the subject of their book proposal and draw up a 'contract of deliverables.' During the fall semester, students will read and report on assigned creative nonfiction readings and participate in online group discussions.

FORMATS: Lecture | Seminar

### JOUR 6101 Mentorship I

CREDIT HOURS: 6

Students will work one-to-one with their mentor to research and develop their individual book proposals as well as begin researching and writing their manuscript projects.

FORMATS: Tutorial

### **JOUR 6102 Publishing I**

CREDIT HOURS: 3

During this one-week residency in Toronto or New York (alternating years), students will attend lectures and seminars with publishers, editors, agents, and established authors, learning about current and future trends in the publishing industry. They will discuss their book proposals-in-progress with agents and editors.

PREREQUISITES: JOUR 6100.03 with a grade of B-

FORMATS: Lecture | Discussion

### **JOUR 6103 Mentorship II**

CREDIT HOURS: 6

Working with their mentor, students will continue researching and writing their manuscripts, as per their contract of deliverables.

PREREQUISITES: JOUR 6101.06

FORMATS: Tutorial

### **JOUR 6151 Journalism Research**

CREDIT HOURS: 3

This course will focus on the essential skills journalists need to produce excellent work. It will include methods of finding facts and sources, digging below the surface, and analyzing the evidence. There will be special emphasis on interviewing. Students will learn how to find and use information tucked away in court, business, and property records. There will also be instruction in using freedom of information laws to get access to government files.

RESTRICTIONS: Must be enrolled in MJ.

### **JOUR 6153 Reporting Fundamentals**

CREDIT HOURS: 3

Students will learn, in the classroom and in the field, the fundamentals of text-based reporting, from identifying a story idea through to research and writing. Beginning with a demonstrated awareness of the news, skills such as finding and pitching an original story idea, conducting an interview, applying the principles of clear writing, and delivering a story with narrative colour will be honed in this class.

RESTRICTIONS: Must be enrolled in MJ.

### **JOUR 6156 Writing and Reporting for Audio and Video**

CREDIT HOURS: 3

An intensive course in reporting using video and audio. This course emphasizes skills including visual storytelling, writing for the ear, interviewing, and performance. Students will learn how to operate a camera and capture clear audio to complement video. They will learn how to develop an eye for visual stories and learn how to capture and edit high-quality audio and video.

RESTRICTIONS: Must be enrolled in MJ.

### **JOUR 6200 Writing Craft II**

CREDIT HOURS: 3

During the second-year residency at King's, students will attend lectures, panels, and seminars. Students will also meet in small groups with their Mentorship III mentors to further discuss craft and ethical issues and finalize plans for their manuscript writing project and draw up a 'contract of deliverables' for Mentorship III.

PREREQUISITES: JOUR 6100.03 (with a grade of B- or higher)

FORMATS: Lecture | Seminar

### **JOUR 6201 Mentorship III**

CREDIT HOURS: 6

Students will work one-to-one and in small groups with a mentor to research, write and edit their individual manuscript projects.

PREREQUISITES: JOUR 6103.06

FORMATS: Tutorial

### **JOUR 6202 Publishing II**

CREDIT HOURS: 3

During this one-week residency in New York or Toronto (alternating years), students will attend lectures and seminars with publishers, editors, agents, and established authors, learning about current and future trends in the publishing industry. They will discuss their manuscripts-in-progress with agents and editors.

PREREQUISITES: JOUR 6102.03 (with a grade of B- or higher)

FORMATS: Lecture | Discussion

### **JOUR 6203 Mentorship IV**

CREDIT HOURS: 6

Working with their mentor, students will continue work on their individual manuscript projects, completing a substantial portion of their manuscript, and revise and polish their final book proposal.

PREREQUISITES: JOUR 6201.06 (with a grade of B- or higher)

FORMATS: Tutorial

### **JOUR 6702 Advanced Reporting**

CREDIT HOURS: 6

This course provides students with an introduction to advanced journalistic methods and practice. Students will acquire additional research and reporting skills essential to the professional project and will be introduced to emerging as well as established research methods and given a methodological framework in which to pursue advanced journalistic research.

PREREQUISITES: JOUR 6857.09

RESTRICTIONS: Must be enrolled in MJ.

### **JOUR 6703 Professional Journalism Environment**

CREDIT HOURS: 3

A seminar course that grounds students in the current practice of journalism. Students will explore the current professional environment of journalism, highlight important changes in practice, discuss evolving technologies in journalism, and explore the professional norms that have developed after years of upheaval.

PREREQUISITES: JOUR 6857.09

RESTRICTIONS: Must be enrolled in MJ.

### **JOUR 6704 Visual Storytelling**

CREDIT HOURS: 3

Journalists today not only need to be good reporters and writers, but also must be able to work adeptly with visual content and create interactive visualizations. This course introduces advanced photography methods and data visualization techniques.

PREREQUISITES: JOUR 6702.06

RESTRICTIONS: Must be enrolled in MJ.

### **JOUR 6705 Data Journalism Methods**

CREDIT HOURS: 3

This course complements the advanced research course to take a deep dive into now-current data journalism practices. In a typical semester, this will include intensive instruction to journalistic data analysis, data acquisition, data cleaning and an introduction to the application of computer programming to journalism.

PREREQUISITES: JOUR 6857.09

RESTRICTIONS: Must be enrolled in MJ.

### **JOUR 6706 The Evolving Business of Journalism**

CREDIT HOURS: 3

Today, a myriad of business models are at the centre of the greatest era of experimentation in the news business since the mass-circulation broadsheet newspaper emerged in the late 19th century. Indeed, the very future of journalism as a business is at stake. Students will learn about current business models and be introduced to approaches used by journalistic entrepreneurs in developing new models.

PREREQUISITES: JOUR 6702.06

RESTRICTIONS: Must be enrolled in MJ.



**JOUR 6709 Journalism and Society**

CREDIT HOURS: 3

This course gives students the background knowledge they need as journalists within the framework of civics and ethics. Studies will focus on the essentials of journalism, thinking critically and independently, and understanding the role of courts, the police and legislative bodies. Students will discuss the importance of fairness and transparency and how to work professionally with sources across cultural and gender lines.

RESTRICTIONS: Must be enrolled in MJ.

**JOUR 6800 Professional Project**

CREDIT HOURS: 3

Students will work through stages to research, write and produce their professional project. In the summer term, students will conduct initial research on the subject matter of their professional project, under the supervision of a faculty member. In the fall term, students will normally begin the reporting and writing of their projects and receive further instruction in the development and writing of large journalistic projects. In the winter term, students will complete the production and publication of their projects.

CALENDAR NOTES: Students are required to register for the professional project in the summer, fall and winter terms. An IP grade will be assigned until the final project is complete, at which time a final grade will be entered.

RESTRICTIONS: Must be enrolled in MJ.

**JOUR 6801 Advanced Data Journalism Methods**

CREDIT HOURS: 3

This course takes students deeper into programming for journalists, teaching basic and intermediate coding skills. Students will explore further how they can use simple computer programs to solve journalistic problems.

PREREQUISITES: JOUR 6705.03

RESTRICTIONS: Restricted to students in the MJ program.

**JOUR 6850 Special Topics in Journalism**

CREDIT HOURS: 3

From time to time, the school may offer courses in specialized areas of journalism theory and/or practice. These courses will allow the school to address timely topics and developments in the fast-changing journalism industry.

RESTRICTIONS: Restricted to students in the Master of Journalism program. Permission of the instructor required.

**JOUR 6857 News Workshop**

CREDIT HOURS: 9

Students in this workshop will serve as reporters and editors for the school's online news portal, which serves the Halifax community. Beginning with a daily story meeting, students will report on news events as they happen each day, using a range of multimedia tools. They will also learn to pitch story ideas quickly and succinctly and develop them into focused stories that put their research and critical thinking skills to work. The course places a heavy emphasis on using social media as a newsgathering and engagement tool. It gives students practice in headline writing and tagging, and also an understanding of analytic measures of story performance.

PREREQUISITES: JOUR 6151.03, JOUR 6153.03, JOUR 6156.03 and JOUR 6709.03

RESTRICTIONS: Must be enrolled in MJ.

**JOUR 6907 New Venture Creation**

CREDIT HOURS: 3

This course exposes students to the issues, problems, and challenges of creating new ventures and provides students with the opportunity to explore and develop venture ideas they have been considering or wish to investigate.

PREREQUISITES: JOUR 6900.03

CROSSLISTED: MGMT 3907.03

FORMATS: Lecture

**JOUR 6950 Independent Study/Directed Reading**

CREDIT HOURS: 3

With the approval of the school and the Faculty of Graduate Studies, students may enroll in an independent study/directed reading course in a specialized area of journalism. The course will normally be in support of the student's professional project. The student will read deeply on the chosen topic under the supervision of a faculty member.

CALENDAR NOTES: Permission of the instructor required.

RESTRICTIONS: Restricted to students in the Master of Journalism Program. Instructor's permission required.

### **JOUR 6951 Independent Study/Directed Reading**

CREDIT HOURS: 6

With the approval of the school and the Faculty of Graduate Studies, students may enroll in an independent study/directed reading course in a specialized area of journalism. The course will normally be in support of the student's professional project. The student will read deeply on the chosen topic under the supervision of a faculty member.

CALENDAR NOTES: Permission of the instructor required.

RESTRICTIONS: Restricted to students in the MJ program. Instructor's permission required.

## **Law**

Location:

Schulich School of Law  
Weldon Law Building  
6061 University Avenue  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-2776

Fax Number: (902) 494-1316

Email Address: [gclaw@dal.ca](mailto:gclaw@dal.ca)

Website: [dal.ca/academics/programs/graduate/law.html](http://dal.ca/academics/programs/graduate/law.html)

## **Staff**

### **Dean**

**Cameron, C.**, BA (St. Mary's), LLB (UNB), LLM (Cambridge). Administration of Civil Justice, Access to Civil Justice, Dispute Resolution, Class Action

### **Associate Dean, Academic**

**Deturbide, M.**, BSc (Dalhousie), BJ (King's), LLB, LLM (Dalhousie). Corporate Law, Commercial Law, Media Issues, Entertainment Law, Environment & Business

### **Associate Dean, Graduate Studies**

**Guibault, L.**, LLB, LLM (Montreal), PhD (Amsterdam), Intellectual Law, Copyright, Patent, Trademark

### **Associate Dean Research (Acting)**

**Devlin, R. F.**, LLB (Queen's, Ireland), LLM (Queen's, ON). Jurisprudence, Legal Ethics, Judicial Education, Contracts

### **Professors Emeriti**

**Archibald, B. P.**, BA (King's), MA, LLB (Dalhousie), LLM (Columbia). Criminal Law & Procedure, Evidence, Comparative Law, Prosecutions Policy, Labor Relations Law

**Kindred, H.**, LLB (Bristol), LLM (London), LLM (Illinois). International Law, Maritime Law

**MacKay, A. W.**, BA (Mt. A), MA (Florida), BEd (Mt. A), LLB (Dalhousie), Human Rights, Administrative Law, Constitutional Law, Civil Liberties

**Woodman, F. L.**, BA (Dalhousie), LLB (Queen's). Tax & Social Policy, especially regarding Women & Children, Estates & Trusts

### **Professors**

**Brooks, K.**, BA (Toronto), LLB (UBC), LLM (Osgoode). Tax Policy, Tax-International, Tax-Corporate, Tax-Income, Tax-Treaties

**Chircop, A. E.**, BA, LLB, LLM (Malta), JSD (Dalhousie). Marine & Environmental Law & Policy, Coastal & Marine Management,

## Education & Training

**Coughlan, S. G.**, BA (Ottawa), MA (Toronto), LLB (Dalhousie), PhD (Toronto). Criminal Law & Procedure

**Currie, R.**, BA (St. FX), MA (Carleton), LLB (Dalhousie), LLM (Univ of Edinburgh). International Criminal Law, Social Media Law, New Media Law

**Doelle, M.**, BSc, LLB (Dalhousie), LLM (Osgoode), JSD (Dalhousie). Climate Change, Environmental Law, International Environmental Law

**Downie, J. G.**, BA, MA (Queen's), MLitt (Cambridge), LLB (Toronto), LLM, SJD (Mich). Health Law Policy and Ethics, Legal Ethics

**Gibson, E.**, LLB (Saskatchewan), LLM (Toronto). Family Law, Torts, Health Law

**Ginn, D.**, BA (Mt. A), LLB (Queen's), LLM (Osgoode). Property Law, Administrative Law, Gender, Health Law

**Kaiser, H. A.**, BA, LLB (Dalhousie), LLM (LSE). Criminal Law & Procedure, Mental Disability Law

**Llewellyn, J.**, BA (McMaster), MA (Queen's), LLB (Toronto), LLM (Harvard). Restorative Justice, Legal Theory, Constitutional Law

**Rotman, L.**, BA (Toronto), LLB (Queen's), LLM (Osgoode), SJD (Toronto). Aboriginal Law, Corporate Governance, Corporate Finance, Corporate Law

**Thompson, D. A.**, BA (McGill), LLB (Dalhousie). Family Law, Evidence, Children & the Law, Clinical Law

**VanderZwaag, D.**, BA (Calvin), MDiv (Princeton), JD (Arkansas), LLM (Dalhousie), PhD (University of Wales). Environmental Law, Ocean Law and Policy

## Associate Professors

**Craig, E.**, BA (Alberta), LLB (Dalhousie), LLM (Yale), JSD (Dalhousie). Evidence, Sexual Assault Law, Criminal Law Ethics, Constitutional Law, Feminist Legal Theory

**Erdman, J.**, BA, JD (Toronto), LLM (Harvard). Health Law & Policy, Public Law & Human Rights

**Lahey, W.**, BA (Mt. A), BA (Juris, Oxford), LLM (Toronto). Administrative Law, Health Law

**MacIntosh, C.**, BA (Concordia), MA (Alberta), LLB (Osgoode). Aboriginal Law, Immigration Law

**Murphy, R. A.**, BA (UPEI), LLB (Dalhousie), LLM (Toronto), SJD (Harvard). Constitutional Law, Evidence, Legal Theory

**Saunders, P. M.**, BA, MA, LLB (Dalhousie). Environmental Law, Law of the Sea, International

**Seck, S.**, BMus (Memorial), MMus (Ottawa), LLB (Toronto), PhD (York). Business, Human Rights & Environment, International Environmental Law, Sustainable Development & Natural Resources Law

**Wildeman, S.**, BA (Toronto), MA (Columbia), LLB (Dalhousie). Mental Health Law, Administrative Law, Legal Theory

## Assistant Professors

**Akinkugbe, Olabisi D.**, LLB Hons. (Lagos, Nigeria), LLM (Toronto), PhD (Ottawa). International Law & Development, Socio-Legal Approaches, Transnational, Business, Law & Policy of Public-Private Partnerships

**Baxter, J.**, BA, MA (McMaster), JD (Toronto), LLM (Yale) PhD candidate (Yale). Property Law, Land Use, Law & Society, Access to Justice

**Hadskis, M.**, BSc, LLB (Dalhousie), LLM (York). Health Law & Policy, Tort Law

**Iftene, A.**, LLB (Babes-Bolyai), LLM, PhD (Queen's). Prison Law & Prisoner's Rights, Criminal, Sentencing

**Lazare, J.**, BA, LLM (McGill), LL, JD, PhD (Ottawa). Family, Gender Equality, Nonhuman animals and the Law

**Metallic, N.**, BA, LLB (Dalhousie), LL (Ottawa), LLM (York). Aboriginal, Indigenous, Constitutional, Administrative

**Penney, J.**, BA, JD (Dalhousie), MSt (Oxford), LLM (Columbia), PhD (Oxford). Law & Technology, Online privacy / surveillance / security, Internet Regulation & Censorship

## Instructors

**Shapiro, J.**, BA (UBC), LLB (Dalhousie), LLM (Columbia). Criminal Law, Administrative Law, Immigration and Refugee Law

**Williams, M.**, BSW (Dalhousie), LLB (Toronto), LLM (NYU). Restorative Justice, Feminist Theory, Race and the Law, Public Interest, Human Rights

## Adjunct (FGS)

**Brown, B.**, BA (Acadia), MA (York), LLB (Toronto), PhD (Dalhousie)

**Dobrowolsky, A.**, BA (Toronto), MA (Dalhousie), PhD (Carleton)

## Adjunct (Retired)

**Black, V.**, BA, MA (Carleton), LLB (Toronto), LLM (Calif, Berkeley)

**McConnell, M. L.**, BA (Victoria), LLB (Dalhousie), PhD (Sydney)

# Master of Laws (LLM)

An intensive graduate program in law leading to the Master of Laws degree is offered to well-qualified candidates by the Schulich School of Law of the University. The program is primarily intended for those looking to further their legal research and knowledge. The program may consist of either a combination of coursework, the graduate seminar and a thesis, or a combination of coursework involving substantial written papers and the graduate seminar. Applicants who plan to take the degree on the basis of course work, seminars and a thesis are required to submit an outline of their proposed thesis topic at the time of the application. Thesis topics may concentrate on any area of law in which faculty supervisors and library resources will support original work. In recent years, thesis supervision has been provided in the following fields, among others: Healthy Law, Law & Technology, Marine & Environmental Law, International Business Law, Criminal Justice, Legal Theory and Indigenous Law.

## Admission Requirements/Deadline

Applicants for admission to the LLM program should hold a first degree in law equivalent to the Dalhousie JD, passed with at least a 3.5 average GPA (or Upper Second-Class Honours). The ability to conduct independent research and work easily with the English language are prerequisites for admission. International candidates are required to pass one of the English language proficiency tests listed here and obtain at least the minimum acceptable score:

**Internet-based TOEFL** 100

**Written TOEFL** 600

**MELAB** 85

**IELTS** 7.5

**CanTest** 4.5 (with no band score lower than 4.0)

**CAEL 70** (with no band score lower than 60)

**Dalhousie College of Continuing Education (CCE)** A

The language competency test may be waived if the applicant has completed a degree at a recognized university where the language of instruction is English. The claims must be verified by the Faculty of Graduate Studies.

Applicants seeking funding should ensure that their completed application is received by **January 15th** along with all original documents. The final deadline for admission consideration (with no offer of funding) is **March 31st**.

## Residency Requirements

The degree may be taken on the basis of either one academic year (September 1 to August 31) of full-time residence at Dalhousie, or two academic years of part-time residence at Dalhousie. It should be noted that the two-year residence requirement for part-time candidates differs from that required for programs outside the Law School explained elsewhere in the calendar of the Faculty of Graduate Studies.

## Course Requirements

The degree may be taken on the basis of either course work, the graduate seminar and a thesis, or coursework and graduate seminar only. Applicants are required to indicate at the time of formal application on which basis they would prefer to take the degree. The availability of places for the thesis alternative is governed by the availability of adequate faculty supervision and library resources. All coursework for the degree, whichever of the two alternative bases is decided upon, must be completed with no grade below B-. Graduate students taking courses that are normally evaluated by an examination are required to complete a research paper or other written assignment, as agreed with the instructor, in place of the examination.

All candidates for the degree are required to take the graduate seminar especially designed for our graduate students in law. This seminar is given in the fall term (and early part of the spring term) and requires from the student a comprehensive class presentation based on a substantial written paper. Some students who have not had previous exposure to Jurisprudence may be required to take a jurisprudence course.

If the degree is taken by coursework, graduate seminar and thesis, a candidate is required to (a) in addition to the graduate seminar, complete at least two additional one-term courses from the course offerings of the Schulich School of Law (the choice of courses to be approved by the Law School's Graduate Studies Committee), and (b) present a well-researched substantial thesis of scholarly quality produced under the continuous supervision of a member or members of the law faculty.

Such a thesis would normally be 125-150 typescript pages in length (double-spaced). The thesis requirements and regulations of the Faculty of Graduate Studies must be met. Theses are usually supervised by a two-person committee comprised of a supervisor and a

reader or, in certain circumstances, two co-supervisors. Theses are examined by an examination committee comprised of the supervisory committee, an “arm’s length” examiner and a chairperson, who is normally the Chair of the Graduate Studies Committee/Associate Dean. A thesis may be graded as falling within one of the following categories: approved as submitted; approved upon specified corrections being made; failed, but with permission to submit a revised thesis; or failed outright.

If the degree is taken by coursework and seminars without thesis, in addition to the graduate seminar, candidates are required to take at least five one-term courses from the advanced coursework and seminar offerings of the Law Faculty considered to be suitable as graduate courses and seminars by the Law Graduate Studies Committee. Of those five courses, at least three must be designated as “major paper courses” by the Schulich School of Law or be approved by the Graduate Studies Committee as having a substantial written component. Graduate students taking courses that are evaluated by a “major paper” must submit a paper of appropriate scholarly quality which will normally be between 40 and 50 pages in length (including text, and endnotes or footnotes). In the remaining courses, the student will be evaluated by means of a substantial research-based written assignment, normally 25-30 pages, or equivalent assignment(s).

At the discretion of the Graduate Studies Committee of the Schulich School of Law, a candidate may be required to submit to an oral examination by the Committee or its nominees in the field of the thesis or that of any written paper presented by the candidate. The Graduate Studies Committee of the Schulich School of Law may recommend the substitution of not more than two seminars or graduate level courses in a discipline other than law, which may be highly relevant to the candidate's thesis topic or area of specialization, provided that any such substituted course or seminar has, in the opinion of the Committee and the Associate Dean, Graduate Studies, equivalence to the law courses being substituted.

Before deciding on the LLM option that best suits them, candidates who are contemplating future doctoral studies should note that some doctoral programs may require the completion of a Master of Laws degree which includes a thesis.

## **General**

The Graduate Studies Committee of the Schulich School of Law may at any time require any candidate for the degree to show cause, in such manner as it may determine, why such candidate should be permitted to continue his or her candidacy.

It should be noted that candidates taking the degree on a part-time basis are not eligible for graduate scholarships.

A student is required to comply with the directions of the supervisor and the decisions of the Graduate Studies Committee of the Schulich School of Law, as well as the rules and regulations of the Faculty of Graduate Studies.

A full description of programs available in the Law School which may be of relevance to graduate students can be found in the general Law School Calendar and in its course selection materials.

## **Doctor of Philosophy (PhD) in Law**

An advanced graduate program in law leading to the PhD degree is offered to a very limited number of highly qualified candidates by the Schulich School of Law at Dalhousie University. Applicants who meet the admission requirements are invited to submit a detailed outline of their proposed thesis and a detailed description of their research plans with their application forms. Such topics will have to be limited to those areas of law for which faculty and library resources will support original work. It is expected that such resources will normally be available in Health Law, Law & Technology, Marine & Environmental Law, International Business Law, Criminal Justice, Legal Theory, and Indigenous Law.

### **Admission Requirements/Deadline**

Applicants for admission to the PhD program must have demonstrated superior academic ability during their previous legal education. Normally it will be necessary to have

- (i) attained at least the equivalent of a Dalhousie A- average grade at the JD level and
- (ii) Successfully completed a Master’s degree in law.

Preference will be given to applicants with established credentials in published scholarship of a professional caliber. The ability to conduct independent research and work easily in the English language is a prerequisite for admission. International candidates are required to pass one of the English language proficiency tests listed here and obtain at least the minimum acceptable score:

**Internet-based TOEFL 100**

**Written TOEFL 600**

**MELAB 85**

**IELTS 7.5**

**CanTest 4.5** (with no band score lower than 4.0)

**CAEL 70** (with no band score lower than 60)

**Dalhousie College of Continuing Education (CCE) A**

The language competency test may be waived if the applicant has completed a degree at a recognized university where the language of instruction is English. The claims must be verified by the Faculty of Graduate Studies.

Applicants should ensure that their completed application is received by **January 15th** along with all original documents.

## Residency Requirements

Applicants must be prepared to spend at least one full academic year (12 months) in continuous residence at Dalhousie after registration for the PhD program. The Graduate Studies Committee of the Law School reserves the right in certain cases to require the completion of a second year of residency. It is to be noted, however, that consistent with other doctoral programs at Dalhousie University, PhD candidates must pay fees at the full-time rate for two years regardless of whether they have spent a second year in residence at Dalhousie.

## Course Requirements

In addition to the period in residence, candidates must complete the following:

1. thesis proposal defence
2. one directed reading course
3. one area exam
4. course work and other examinations as required by the Graduate Studies Committee
5. fully supervised research work leading to a substantial and significant dissertation (300-400 typescript double-spaced pages)

## Special Skill Examination Requirements

A candidate may, at the discretion of the thesis committee, be required to pass a special examination designed to demonstrate the examinee's proficiency in a foreign language, statistical method, computer analysis, or other skill deemed to be important for successful completion of the candidate's thesis in the chosen area.

## Thesis Requirements

The primary requirement for the PhD degree is the completion of a substantial thesis which should not only display original scholarship of high standard, but also represent a significant and professional contribution to the literature of the chosen subject. In applying for admission, an applicant is required to satisfy the Graduate Studies Committee of the Schulich School of Law that the suggested topic is suitable for development as a doctoral thesis. Normally, a PhD thesis should be between 350 and 500 typescript pages in length (double-spaced). After an applicant has been accepted, a thesis committee consisting of a supervisor and two advisors will be appointed by the Graduate Studies Committee of the Schulich School of Law. All candidates are required to comply with the decisions of their thesis committees. In normal circumstances, the completed PhD thesis must be submitted to the Graduate Studies Committee of the Schulich School of Law within five years of the date of original registration in the program. Submission of the thesis must follow the rules and regulations laid down by the Faculty of Graduate Studies.

## Thesis Defence Requirements

Each PhD candidate is required to defend the completed thesis in an oral examination. This defence shall be conducted in accordance with the Faculty of Graduate Studies Regulations for Oral Examination of a Doctoral Candidate.

## Courses

For a description of courses offered in Law, see the [Dentistry, Law, Medicine calendar](#).

For more information, please visit our website [www.dal.ca/academics/graduate/law](http://www.dal.ca/academics/graduate/law)

## Faculty of Management

Location:  
Kenneth C. Rowe Management Building  
6100 University Avenue  
3rd Floor  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-2582  
Fax Number: (902) 494-1195  
Email Address:  
Website: [management.dal.ca](http://management.dal.ca)

## Management

Management courses are included in the graduate programs offered by the following schools: Business Administration, Information Management, Public Administration, and Resource and Environmental Studies.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **MGMT 5000 Management Without Borders: A Foundation Course for Masters Students in Management**

CREDIT HOURS: 3

This course places management in its broadest context and helps students from diverse disciplines understand the complex social, economic, ecological, political and technological forces shaping 21st century leadership in the public, private and non-profit sectors. Key themes explored in the course include systems thinking, responsible leadership, sustainable economic development, stakeholder theory, risk management and knowledge management. A significant portion of the course is devoted to interdisciplinary / inter-professional group work. Students from different programs are brought together to work with a Nova Scotia organization that has identified a relevant and timely project topic for the group. The project provide students with the opportunity to hone important skills in team dynamics, interpersonal communication, project management, managing scope and ambiguity, information gathering, research and writing professional reports. The course is team taught by leading faculty from across the Faculty of Management as well as guest speakers. Learning opportunities are delivered in a mix of formats, including lectures, tutorials, readings, multidisciplinary cases and group discussions.

FORMATS: Lecture | Tutorial

### **MGMT 5001 Information, People and Society. Part 1**

CREDIT HOURS: 3

This course provides an introduction to the economic, political, and social dimensions of an information-rich environment. Includes consideration of the historical development of information and knowledge production, issues of control versus free flow of information management in support of situational understanding and decision-making, the organization of knowledge, and the ethical and legal aspects of information management.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5002 Organization of Information, Part 1**

CREDIT HOURS: 3

Information management is the management of organizational processes and systems that acquire, create, organize, distribute, and use information. This course examines the various means by which information can be organized to facilitate its retrieval, management, and use, and provides an overview of the principles and theories of metadata development and implementation in the digital environment. Emphasis will be placed on metadata interoperability, vocabulary control, standardization, quality control and evaluation. Contextually relevant information is essential to support decision making and strategic planning by individuals, groups, and organizations. An introduction to the principles of IA is included, as they interconnect with best practices in the Organization of Information.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5003 Information Systems & Technologies, Part 1**

CREDIT HOURS: 3

This course makes clear the relationship between IT and IM, often misconstrued in organizations. The course includes theories of databases and integrated systems design, allied with practical applications of a wide range of information technologies to support organizational goals. These include traditional intranet and extranet applications along with emerging Web 2.0 technologies. Concepts of information architecture (IA) are introduced relating to the design of shared information environments which are often web-based, including intranets, databases, and online communities. The practices of IA are examined through analyses of real organizations and how the information environment can best serve their mission, goals, processes, clients, suppliers, and other stakeholders.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5004 User Experience, Part 1**

CREDIT HOURS: 3

Understanding of theories and practices of human computer interaction is a key determinant of organizational success. This course explores how technology affects human use and examines the process from conception of an idea to design and evaluation, with a particular emphasis on Web-based activities. The course discusses individuals' and groups' information seeking behaviours in public and private contexts, and the theories and models of information seeking behaviour that contribute to a nuanced understanding of the user experience.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5005 Information Policy, Part 1**

CREDIT HOURS: 3

This course explores a range of critical information issues facing organizations and the effects of policies and legislation on information management and organizational effectiveness. Topics include access to information, freedom of information, protection of privacy, preservation of information, etc. Professional ethics guiding information professionals are discussed alongside compliance. By law(s) in Canada, all government and corporate entities are required to appoint an individual responsible for privacy within the organization, and all government and selected other agencies are required to delegate staff responsible for information access and privacy. Discusses the roles of all levels of government, the private and not-for-profit sectors, and key individuals, in developing policies which affect information creation, control, access and use. Focuses on Canadian issues, while including international perspectives.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5006 Program Evaluation, Part 1**

CREDIT HOURS: 3

Introduces the concepts and components of evaluation as part of the increasing demand for accountability and as an integral part of program management. The course uses evaluation theory and program theory as the basis for all evaluation activity. Connection will be made with current evaluation issues and debates in the public and non-profit sectors.

### **MGMT 5007 Research Methods, Part 1**

CREDIT HOURS: 3

Introduces concepts, methods (both quantitative and qualitative), and the practices of research that support evidence-based information management practice. Addresses the nature and uses of research, tools for research, handling of evidence, analysis, and interpretation of findings, reporting of results, evaluation of published reports, and the management of research.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5008 Knowledge Management, Part 1**



CREDIT HOURS: 3

Knowledge management (KM) encompasses a range of theories and practices relating to the creation, identification, accumulation, and application of knowledge to meet organizational goals. This course discusses theories of KM, intellectual capital and learning organizations, and practices for efficient and effective harnessing of organizational knowledge. An integrative approach is adopted, based on the key KM theories and concepts developed in the past decade and applying them across a wide range of organizational settings.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5009 Collaboration, Part 1 (Elective)**

CREDIT HOURS: 3

Geographically dispersed workplace teams who cross time, space and organizational boundaries are increasingly common. Information managers increasingly contribute expertise to ensure that such teams have effective decision-making processes and contribute to organizational strategic goals. Virtual collaboration can take place through many modes including audio or teleconferencing, online communities, and others. Team members have a common purpose and interdependent organizational and performance goals. This course introduces theories and concepts relating to the rationale for, benefits and challenges of virtual workplace teams, steps for developing effective virtual teams and examples of technology that supports such teams.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5010 Project Management, Part 1 (Elective)**

CREDIT HOURS: 3

This course introduces theories and practices of project management (PM) related to project objectives, development stages and control variables such as time, cost, and scope. PM stages include initiation, development, execution and maintenance and the course explores these through workplace case studies related to students' professional experience. Adaptive as well as pre-planned methods and approaches are explored, including process-based systems, critical path, and event chain.

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5011 Management of Privacy, Part I**

CREDIT HOURS: 3

This course provides an overview of privacy and how it impacts organizations in both the private and public sectors. In this course we will address the various ways of identifying and mitigating privacy risk.

CALENDAR NOTES: Distance/Online: Lectures and online discussions, synchronous and asynchronous, all online via Brightspace Course Mgmt System

RESTRICTIONS: Restricted to students registered in the Master of Information Management program

FORMATS: Online Delivery

### **MGMT 5012 Records Management, Part 1 (Elective)**

CREDIT HOURS: 3

How organizations engage in document or records management has a direct bearing on their efficiency and effectiveness, including legal and ethical compliance. The course offers a comprehensive introduction to the field of records and information management in all formats including, but not limited to, paper and digital. Topic covered include: records creation, evaluation, maintenance and control; records classification system; records retention; records disposition; and vital records and continuity planning.

PREREQUISITES: MGMT 5002.03

CROSSLISTED: INFO 6370.03

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5015 Information Policy, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5005.03 Part 1 and is a face-to-face, two-day intensive period. Course will allow students to bring together and apply the concepts and materials from MGMT 5005, consider the international context within which information policy issues in Canada are situated, and to provide students with the opportunity for sufficient grounding in relevant areas of law.

COREQUISITES: MGMT 5005.03

FORMATS: Lecture | Discussion

### **MGMT 5020 Capstone Course, Part 1**

CREDIT HOURS: 3

Based on individual learning objectives, students may choose either a case study or a research project as the final assessed item for the Program Structure. They will have been advised, in light of their interests, to take either MGMT 5006 or MGMT 5007 as preparation for the Capstone. Students work with an

advisor, under the general supervision of the course instructor, to complete a case or a project of special relevance to their workplace. Cases and projects are assessed on the extent to which they demonstrate application of the theories and techniques explored throughout the program.

PREREQUISITES: MGMT 5006.03 or MGMT 5007.03

FORMATS: Lecture | Discussion | Online Delivery

### **MGMT 5101 Information, People and Society, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5001: Part 1 and is a face-to-face, two-day intensive period. Course will outline and emphasize options and strategies to address information management issues arising in the context of topics considered in MGMT 5001 and developed from IM case studies. [A take home exam will be completed following the onsite intensive.]

COREQUISITES: MGMT 5001.03

FORMATS: Lecture | Discussion

### **MGMT 5102 Organizational of Information, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5002: Part 1 and is a face-to-face, two-and-a-half-day intensive period. Course will focus on practical applications of theories learned in MGMT 5002, notably metadata standards and document content management systems. [A take home test will be completed as part of this intensive.]

COREQUISITES: MGMT 5002.03

FORMATS: Lecture | Discussion

### **MGMT 5103 Information Systems and Technology, Part 2**

CREDIT HOURS: 1

This course complements MGMT 5003 and is a face-to-face, two-and-a-half-day intensive period. Course will focus on the practical applications of theories learned in MGMT 5003, notably working in an "always on" information environment, business intelligence, influences of the "mash-up" and social networking.

COREQUISITES: MGMT 5003.03

FORMATS: Lecture | Discussion

### **MGMT 5104 User Experience, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5004 and is a face-to-face, two-day intensive period. Course will build on knowledge gained during the online course MGMT 5004. Students will learn and practice effective ways to present plans and findings from usability studies, and work as a team during a mock UCD process.

COREQUISITES: MGMT 5004.03

FORMATS: Lecture | Discussion

### **MGMT 5105 Government Structure and Organization**

CREDIT HOURS: 3

This course focuses on the Canadian system of government and addresses basic organizational theory and design as well as fundamental issues of public management.

FORMATS: Online Delivery

### **MGMT 5106 Program Evaluation, Part 2**

CREDIT HOURS: 1

Course complements MGMT 5006 and is a face-to-face, two-day intensive period. Course will build on knowledge gained during the online course MGMT 5004. Students will learn and practice effective ways to present plans and findings from usability studies, and work as a team during a mock UCD process.

COREQUISITES: MGMT 5006.03

FORMATS: Lecture | Discussion

### **MGMT 5107 Research Methods, Part 2**

CREDIT HOURS: 1

Complements MGMT 5007 which introduces concepts, methods (quantitative and qualitative), and the practices of research that support evidence-based information management practice. Addresses the nature and uses of research, tools for research, handling of evidence, analysis, and interpretation of findings, reporting of results, evaluation of published reports, and the management of research.

COREQUISITES: MGMT 5007.03

FORMATS: Lecture | Discussion

### **MGMT 5108 Knowledge Management, Part 2**

CREDIT HOURS: 1

This two-day intensive complements the online course MGMT 5008-Knowledge Management, Part 1, that defines the theoretical & practical applications of knowledge management as it applies to organizational growth and development. The course elaborates on the identification, creation, accumulation, and application of information as it is transformed to intellectual capital for learning organizations.

COREQUISITES: MGMT 5008.03

FORMATS: Lecture | Discussion

### **MGMT 5109 Collaboration, Part 2 (Elective)**

CREDIT HOURS: 1

Course complements MGMT 5009: Part 1 and is a face-to-face, two-day intensive period. Course will help students apply the theories and concepts learned in MGMT 5009 through the examination of case studies of collaboration. Students will be LED through the process of choosing an appropriate technology and devising an implementation plan within their own organization.

COREQUISITES: MGMT 5009.03

FORMATS: Lecture | Discussion

### **MGMT 5110 Strategic Management in the Public Sector**

CREDIT HOURS: 3

This course explores the concepts, potential and dynamics of strategic management in modern public administration. A wide variety of management instruments and techniques are analyzed.

FORMATS: Online Delivery

### **MGMT 5111 Management of Privacy, Part II**

CREDIT HOURS: 1

The course will integrate the subject matter covered in MGMT5011: Management of Privacy: Part I. This course (Part II) will be structured upon the knowledge and understanding of privacy and its management gained from lectures, discussions, and readings from MGMT5011: Management of Privacy: Part I. This continuation of the Management of Privacy will further explore strategies, options, and tools to address privacy issues faced by organizations.

COREQUISITES: Must be registered in or completed MGMT 5011

RESTRICTIONS: Restricted to MIM Students

FORMATS: Lecture | Seminar

### **MGMT 5112 Records Management, Part 2 (Elective)**

CREDIT HOURS: 1

How organizations engage in document or records management has a direct bearing on their efficiency and effectiveness including legal and ethical compliance. This course offers a comprehensive introduction to the field of records and information management in all formats including, but not limited to, paper and digital. Topics covered include: records creation, evaluation, maintenance and control; issues related to the maintenance, storage and disposition of records.

COREQUISITES: MGMT 5012.03

FORMATS: Lecture | Discussion

### **MGMT 5120 Capstone Course, Part 2**

CREDIT HOURS: 1

This two-day intensive session will include an in-class critical evaluation exercise relating to the MIM program's learning objectives and students' perceived learning outcomes. The remainder of the intensive will involve student presentations of their projects followed by question-and-answer sessions.

COREQUISITES: MGMT 5020.03

FORMATS: Lecture | Discussion

**MGMT 5125 Policy Formulation & Analysis**

CREDIT HOURS: 3

This course covers the techniques, theory and contextual underpinnings central to effective policy management. The course explores strategic approaches to policy design and the role of the policy analyst in modern government.

FORMATS: Online Delivery

**MGMT 5135 Managerial Economics**

CREDIT HOURS: 3

This course elucidates basic microeconomic theories and principles and applies these to economic decision making. The course increases understanding of the relationship between economic theory and economic policy.

FORMATS: Online Delivery

**MGMT 5140 Public Economics**

CREDIT HOURS: 3

Introduces the basic principles of public finance and macroeconomics. The role of risk analysis in public sector decision-making is also explored. The course places a special emphasis on the role of government in the economy and on the application of economic theory in public policy analysis within the framework of the Canadian federation.

CROSSLISTED: PUAD 5140.03

FORMATS: Online Delivery

**MGMT 5146 Research Methods**

CREDIT HOURS: 3

This course provides a practical setting for understanding the purchase, management, and evaluation of research products. Applied research methods, research services and best practices are discussed in depth.

FORMATS: Online Delivery

**MGMT 5155 Financial and Managerial Accounting**

CREDIT HOURS: 3

This course reviews each of the forms of accounting and financial data that public sector managers will be faced with now – and in the future. The essential concepts of financial and managerial accounting are comprehensively reviewed.

FORMATS: Online Delivery

**MGMT 5160 Modern Comptrollership**

CREDIT HOURS: 3

This course focuses on the public policy and management issues of governance. It emphasizes development of the skills necessary to assess financial management approaches, develop business plans and implement performance measurement.

FORMATS: Online Delivery

**MGMT 5210 Project Management, Part 2**

CREDIT HOURS: 1

This onsite intensive complements the distance portion of this course (MGMT 5010), the description and goals for which are provided separately.

COREQUISITES: MGMT 5010.03

FORMATS: Lecture | Discussion

**MGMT 5250 Strategic Financial Management**

CREDIT HOURS: 3

This class focuses on the financial public policy and management issues of governance, budgeting, and accountability. It emphasizes development of the skills necessary to assess financial management approaches, develop business plans and implement performance measurement.

RESTRICTIONS: Graduate Level  
FORMATS: Lecture

### **MGMT 6400 Municipal Government**

CREDIT HOURS: 3

The course looks at local government's position in the broader public governance structure, its powers and responsibilities, structure and resources interaction with the public, and advocacy role. The course emphasizes the municipal manager's perspective which is to both understand an issue and develop and promote workable solutions for the municipality.

FORMATS: Other (explain in comments)

### **MGMT 6501 Business and Government**

CREDIT HOURS: 3

This course presents the relationship between government and business in North America. It offers a practical approach to understanding the differences in how government and business operate, highlighting the techniques used by each side to influence the other.

FORMATS: Online Delivery

### **MGMT 6525 Program Evaluation**

CREDIT HOURS: 3

This course examines the theory, methods, and issues of this growing field. The course emphasizes the skills necessary to assess feasibility of a programme evaluation and to design it. Topics also include underlying values, alternative approaches, and implementation and utilization.

FORMATS: Online Delivery

### **MGMT 6555 Managing the Information Resource**

CREDIT HOURS: 3

This course examines the complex technological changes affecting public administrators. It provides broad-based information about the technological advances underway in Canada and fosters understanding of the opportunities and problems these changes present.

FORMATS: Online Delivery

### **MGMT 6610 Conflict and Negotiation Management: Personal Practice Foundations**

CREDIT HOURS: 3

This course explores the world of interpersonal communication, conflict and negotiation and the variety of approaches and range of skills needed to solve problems, reach agreements, and maintain relationships. It will enable participants to understand the positive and negative dimensions of conflict, analyze the dynamics of formal and informal negotiations, and interact with others with greater awareness, intention, and skill.

CROSSLISTED: MGMT 4610

FORMATS: Lecture | Discussion

### **MGMT 6650 Human Resource Management**

CREDIT HOURS: 3

This course explores the evolving practices and challenges faced by organizations seeking to excel in human resources – an essential determinant of organizational success.

FORMATS: Online Delivery

### **MGMT 6700 Managing People in Diverse Organizations**

CREDIT HOURS: 3

This course explores how managers can deal effectively with human problems in their organizations. Topics include motivation, leadership, communications perception, and group dynamics.

FORMATS: Online Delivery

### **MGMT 6701 Directed Readings**

CREDIT HOURS: 1

Provides students with an opportunity to develop a specific interest in the information management field by studying an aspect of a topic in greater detail than is possible within an existing course, studying an area not currently covered by the curriculum, or conducting a research study or special project.

Available by arrangement with the Director.

FORMATS: Online Delivery

### **MGMT 6702 Directed Readings**

CREDIT HOURS: 1

Provides students with an opportunity to develop a specific interest in the information management field by studying an aspect of a topic in greater detail than is possible within an existing course, studying an area not currently covered by the curriculum, or conducting a research study or special project.

Available by arrangement with the Director.

FORMATS: Online Delivery

### **MGMT 6703 Directed Readings**

CREDIT HOURS: 1

Provides students with an opportunity to develop a specific interest in the information management field by studying an aspect of a topic in greater detail than is possible within an existing course, studying an area not currently covered by the curriculum, or conducting a research study or special project.

Available by arrangement with the Director.

FORMATS: Online Delivery

### **MGMT 6705 Analytical Methods**

CREDIT HOURS: 3

This course, an advanced graduate course, investigates public-sector organization, research methods and management practices. It reviews strategies and methods guiding organizational change, renewal, and re-engineering.

### **MGMT 6735 21ST Century Public Service Leadership**

CREDIT HOURS: 3

High intensity leadership for improved governance, management, and service delivery is vital to public services in Canada. This course helps develop public service leaders by exploring the latest theory and best practices, emphasizing the latest concepts and approaches, visioning and strategic thinking, management excellence, team building, engagement, and ethics.

PREREQUISITES: MGMT 5125.03, MGMT 5105.03

FORMATS: Lecture | Discussion

### **MGMT 6745 Risk Analysis and Management in the Public Sector**

CREDIT HOURS: 3

This course offers students the opportunity to analyze, understand and manage risk in the public sector. The approach combines risk management theory and practice from several disciplines. It aims to help public managers and policy analysts understand, assess and manage, complexity, uncertainty and ambiguity more effectively.

FORMATS: Online Delivery

### **MGMT 6755 Intergovernmental Relations in Canada**

CREDIT HOURS: 3

This course focuses on a wide array of policy areas and uses case studies to demonstrate how intergovernmental issues - such as fiscal federalism and coordination of service delivery - are successfully resolved.

FORMATS: Online Delivery

## **Marine Affairs Program**

Location:

Life Sciences Centre

1355 Oxford Street

Room 807  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3555  
Fax Number: (902) 494-1123  
Email Address: [Marine.Affairs@dal.ca](mailto:Marine.Affairs@dal.ca)  
Website: [www.marineaffairsprogram.dal.ca](http://www.marineaffairsprogram.dal.ca)

## Introduction

The Marine Affairs Program offers the Master of Marine Management (MMM). The MMM degree is a 16-month professional, non-thesis and interdisciplinary degree program offering courses in the marine, social, management and political sciences. Students undertake internship placements that contribute to their graduate project research and have an emphasis on the management of a selected topic pertinent to the coastal and marine environment.

## Staff

### Director

**Aporta, C.**, BA, PhD (Alberta)

### Faculty

**Aporta, C.**, BA, PhD (Alberta), Marine Affairs Program  
**Bailey, M.**, BSc, MSc, PhD (UBC), Marine Affairs Program  
**Cavanagh, E.**, BSc, BArch, PhD (Lehigh), Architecture  
**Chircop, A.**, LLD, LLM, JSD (Dalhousie), Law and Marine Affairs Program  
**Fanning, L.**, BSc, MMM, PhD (Dalhousie)  
**Filgueira, R.**, BSc, PhD (Universidad de Vigo)  
**Hill, P.**, AB (Dartmouth), MSc, PhD (Wash), Oceanography  
**Lane, P. A.**, MSc, PhD (SUNY Albany), Biology  
**Pelot, R. P.**, BSc, MSc, PhD (Waterloo), Industrial Engineering  
**Taggart, C.**, BSc, MSc, PhD (McGill), Oceanography and Marine Affairs Program  
**VanderZwaag, D.**, BA, MDiv, JD, LLM (Dalhousie), PhD (Univ of Wales), Law

### Adjunct (FGS)

**Apostle, R.**, BA, MA, PhD (Calif, Berkeley), Sociology and Social Anthropology and Marine Affairs Program  
**Brooks, M.**, BOT, MBA, PhD (Wales), Business Administration  
**Butler, M.**, BSc, MSc (Memorial), International Ocean Institute  
**Charles, A.**, BScH, PhD (UBC), Finance and Management Science, St. Mary's University  
**Hildebrand, L.**, BScH, MES (Dalhousie), PhD (Cardiff), World Maritime University  
**Hodgson, J. R.**, BSc, MSc (London), FCILT, Marine Affairs Program  
**Kearney, J.**, BSc (Acadia), MES (Dalhousie), PhD (Laval), John F. Kearney & Associates  
**Mahon, R.**, BSc, MSc, PhD (Guelph), University of the West Indies  
**Matz-Luck, N.**, LLM, JD (Heidelberg Univ Law School), University of Kiel  
**McAllister, R. I.**, MA, MA (Cantab), Marine Affairs Program  
**McConnell, M. L.**, BA, LLB, PhD (Sydney), Law  
**McConney, P.**, BSc, MES, PhD (UBC), University of the West Indies  
**Milley, C.**, BSc, MSc, MMM (Dalhousie), Marine Affairs Program  
**Schmidt, J.**, MSc, PhD (Christian-Albrechts-Universität zu Kiel), Marine Affairs Program  
**Wells, P. G.**, BSc, MSc, PhD (Guelph), International Ocean Institute  
**Westhead, M.**, BSc, MSc (Acadia), Marine Affairs Program  
**Williamson, H.**, BSc, BEd, LLB, MBA (Dalhousie), Marine Affairs Program

### Cross Listed Faculty

**Boxall, J.**, BA, BEd, MA, MLIS (Dalhousie), Planning  
**Grant, J.**, BSc, PhD (South Carolina)

# Admissions Requirements

Applicants must satisfy general requirements for admission to the Faculty of Graduate Studies. These include a Bachelor's Degree from a university of recognized standing with honours or its equivalent with a minimum average of B (3.0 GPA, 73%- or Second-Class Honours, Upper Division). In some cases, additional university education may be required. Selection criteria include research statement on the marine management problem that the applicant is most interested or knowledgeable, specifying how addressing the problem will benefit society and the applicant's career. Applicants must satisfy the English Language Proficiency requirements of Dalhousie University. For more information, see "English Language Proficiency" under "[Admissions Requirements](#)" for the Faculty of Graduate Studies.

The MMM degree may be completed on a part-time basis. Applicants must meet the same requirements for admission as full time MMM students. Contact the Marine Affairs Program for requirements and further information.

**Deadline for applications is January 31 for scholarship consideration. A minimum GPA of 3.7 is required for scholarship consideration. All additional applications should be received by March 31.**

## Master of Marine Management (MMM)

The Master of Marine Management (MMM) provides a theoretical and practical basis for understanding coastal and ocean development, planning, and conservation issues affecting the sustainable use of the seas' resources. The MMM degree is a professional, interdisciplinary, non-thesis program requiring core courses in the marine, social and management sciences as well as a choice of electives from areas such as marine science, policy, and law.

The overarching emphasis of the program is on the solution of marine management problems by trans-disciplinary synthesis. Teamwork in research and planning is the primary *modus operandi* of the Marine Affairs Program. The MMM degree's format attracts mid-career professionals from all over the world.

Subject areas addressed in the program include but are not limited to coastal tourism, arctic environmental knowledge, climate change adaptation, coastal tourism, community based co-management, development of non-living resources, eco-labelling and seafood certification, ecosystem based management, fisheries management, indigenous knowledge systems, integrated coastal zone management, marine conservation, marine law and policy, marine protected areas, marine spatial planning, maritime enforcement, maritime transport, risk management, and ocean governance. Students are required to complete a graduate project with an emphasis on management, and to undertake a training internship at an organization relevant to their expertise and interests.

The Master of Marine Management degree program begins in September of each year. The duration of the program for full-time study is 4 consecutive terms (16 months) to complete the required courses. Students are required to complete the required courses in Terms 1, 2 and 4, the internship and field work for the research in Term 3, and the writing and submission of the graduate project research and oral presentation as well as any remaining course requirements in Term 4.

Students of the Master of Marine Management degree program must obtain 30 credit hours to graduate. The MMM program is made up of core required courses (21 credit hours) and electives courses (9 credit hours). Students tailor their MMM degree through the selection of electives that support their graduate project research and career interests.

Fall Term (term one)

Core required courses:

MARA 5010.03 Contemporary Issues in Ocean Management and Development Part 1

MARA 5004.03 Marine Management Skills Development

Winter Term (term two)

MARA 5011.03 Contemporary Issues in Ocean Management and Development Part 2

MARA 5003.03 Marine Science and Technology

Summer Term (term 3)

MARA 5002.06 Graduate Project



Fall term (term 4)  
MARA 5002.06 Graduate Project (continued)  
MARA 5009.03 Coastal Zone Management

Electives (9 credit hours) are selected over the course of the MMM program in collaboration with a MAP faculty member.

## Scholarships

Scholarships are available on a competitive basis. A minimum GPA of 3.7 is required for scholarship consideration. Check the Master of Marine Management website for current opportunities.

All applicants are encouraged to apply for external scholarships, including NSERC and SSHRC as appropriate. Applicants are urged to apply for external scholarship funding from donor organizations, foundations, and their home countries. Applicants should be mindful of the application deadline of potential scholarships in the event that they need assistance from MAP to contribute any supporting documentation for their scholarship application.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

All elective courses are open to graduate students in other programs by permission of the instructor.

To facilitate the success in the MMM interdisciplinary degree program, Marine Affairs requires students lacking a foundation in marine sciences or social sciences be exposed to introductory courses in oceanography (OCEA 2001.03 The Blue Planet I and OCEA 2002.03 The Blue Planet II) and/or in the social sciences (SOSA 1002 People and Culture). OCEA 2001 and OCEA 2002, and SOSA 1002 are undergraduate courses that provide students with some exposure to the forces at play in the marine environment, and social science theories, methodologies, and approaches. The MAP Director, in association with the MAP Admissions Committee, advises the student on which course(s) are required by the student to take as ancillary course(s) during the MMM program.

## Course Descriptions

### **MARA 5002 Graduate Project**

CREDIT HOURS: 6

Students are required to apply the knowledge gained through course work to a specific planning and management problem or issue of interest to them. The project contains both a written and a practical component. The written portion is completed under the supervision of an appropriate academic advisor. Students are required to give a presentation on their graduate project. The practical component provides students an internship period with a local public or private sector agency of relevance to the project topic. The area of research must be approved by the MAP Director and Graduate Project Committee.

### **MARA 5003 Marine Science and Technology**

CREDIT HOURS: 3

This course provides a survey of marine science and technology (basic marine-basin geography and geology, physical, chemical, and biological oceanography). Various fields and topics are addressed from a scientific research and technology application perspective. Where possible, and relevant, the application of the scientific findings to issues of management, resource exploitation and policy formation are addressed. Course content and assignments should help marine managers use science and technology to: 1) recognize/formulate problems; 2) identify relevant information necessary to address problems; 3) find relevant and reliable information/assistance; 4) reliably interpret the information to make objective management decisions.

RESTRICTIONS: MMM students only

FORMATS: Seminar

### **MARA 5004 Marine Management Skills Development**

CREDIT HOURS: 3

This course will cover tools and techniques that are relevant for today's marine managers. Students will be introduced to and will practice risk assessment, applied GIS and the project cycle.

PREREQUISITES: MMM students only

FORMATS: Seminar

### **MARA 5005 Independent Readings**

CREDIT HOURS: 3

This course is an option for MMM students who wish to pursue independent research into a specific topic not covered in another course. The topic and area of research must be approved by the MAP Director and the research supervisor.

### **MARA 5008 Integrated Maritime Enforcement**

CREDIT HOURS: 3

The aim of this course is to sensitize students to the complexities of maritime enforcement within a coastal and ocean management framework by building an understanding of the roles of maritime enforcement in integrated planning and management. In doing so, students are introduced to concepts, tools, techniques, and procedures of enforcement.

FORMATS: Seminar

### **MARA 5009 Coastal Zone Management**

CREDIT HOURS: 3

This course is designed to introduce students to the concepts, principles, approaches, and issues associated with integrated management of coastal zones worldwide. It uses a systems approach to understanding the global context of coastal zone management. Case studies and examples from developed and developing countries are used to present practical approaches to the management of multiple uses in the coastal zone, including community-based management models.

CROSSLISTED: ENVI 5204.03, LAWS 2041.03

### **MARA 5010 Contemporary Issues in Ocean Management and Development - Part 1**

CREDIT HOURS: 3

This course offers an introduction to the field of marine affairs and to the broad suite of contemporary issues confronting the ocean and coastal manager. As a foundation core course for MMM students, the course draws on examples from topical streams of the MMM degree program. Subject areas addressed include current governance approaches, negotiation, and consensus building, managing and assessing risk to both the human and natural components of the ecosystem and protection and preservation of the coastal and marine environment and the communities that depend on them. The course employs interactive teaching techniques with a group work component.

CALENDAR NOTES: Credit can only be given for this course if MARA 5010 and MARA 5011 are completed in consecutive terms.

RESTRICTIONS: MMM students only

FORMATS: Seminar

### **MARA 5011 Contemporary Issues in Ocean Management and Development - Part 2**

CREDIT HOURS: 3

This course offers an introduction to the field of marine affairs and to the broad suite of contemporary issues confronting the ocean and coastal manager. As a foundation core course for MMM students, the course draws on examples from topical streams of the MMM degree program. Subject areas addressed include current governance approaches, negotiation, and consensus building, managing and assessing risk to both the human and natural components of the ecosystem and protection and preservation of the coastal and marine environment and the communities that depend on them. The course employs interactive teaching techniques with a group work component.

CALENDAR NOTES: Credit can only be given for this course if MARA 5010 and MARA 5011 are completed in consecutive terms.

RESTRICTIONS: MMM students only

FORMATS: Seminar

### **MARA 5012 Community-Based Co-Management**

CREDIT HOURS: 3

This course will critically examine the extent to which community-based co-management provides a viable approach to marine resource management in terms of its costs and benefits, opportunities for and barriers to its implementation, and conditions necessary for its long-term survival as a practical management tool.

FORMATS: Seminar

### **MARA 5013 Marine Protected Areas**

CREDIT HOURS: 3

The role of MPAs around the world is continually evolving. From fully no-take marine reserves to multiple use marine parks, the range of options available to marine managers is explored. Using the foundations of marine spatial planning, this course will provide the latest information on MPAs with a focus on the Canadian context with exploration of international experiences and best practices.

CROSSLISTED: BIOL 5013.03

### **MARA 5015 Marine Transportation Policy and Administration**

CREDIT HOURS: 3

This course will provide a comprehensive overview of marine transportation and related activities. Special emphasis is placed on the role of government, including the formulation of marine transportation policy, supporting legislation/regulation, the development and delivery of regulatory programs, the provision of public marine support services, and associated governance considerations.

FORMATS: Seminar

### **MARA 5021 Fisheries Management**

CREDIT HOURS: 3

This interdisciplinary course focuses on the theory and practice of fishery management, with emphasis on Sustainable Fishery Systems. It will address the structure and dynamics of fisheries, and key themes in managing fisheries for sustainability and resilience, through seminars and class discussion, as well as attendance at related fisheries and coastal events.

CROSSLISTED: ENVI 5021.03

FORMATS: Seminar

### **MARA 5537 Ocean Governance**

CREDIT HOURS: 6

### **MARA 5589 Politics of the Sea**

CREDIT HOURS: 3

The course will examine environmental, political and economic forces which affect contemporary ocean governance and management. Contemporary issues will be used to explore the geo-political ocean on a sectoral basis (transportation, fisheries and resources, military, etc.), as well as analyzing the evolution of national oceans policies and institutions.

CROSSLISTED: POLI 5589.03

EXCLUSIONS: POLI 4590.03

FORMATS: Seminar

## **Mathematics and Statistics**

Location:

Chase Building

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2572

Fax Number: (902) 494-5130

Email Address: [gradsect@mathstat.dal.ca](mailto:gradsect@mathstat.dal.ca)

Website: [www.mathstat.dal.ca](http://www.mathstat.dal.ca)

# Mathematics and Statistics

For information on specific programs and courses in Mathematics, Statistics, or Computer Science please refer to the [Mathematics](#), [Statistics](#), or [Computer Science](#) sections of this calendar.

## Staff

### Chairperson of the Department

**Janssen, J.C.M.**, MSc (Eindhoven), PhD (Lehigh)

### Professors

**Bielawski, J.**, MA, PhD (Texas A & M Univ), joint appointment with Biology

**Brown, J.**, MSc, PhD (Toronto)

**Coley, A. A.**, PhD (London)

**Dilcher, K.**, PhD (Queen's)

**Dowd, M.**, MBA, MES, PhD (Dalhousie), Director of Statistics

**Faridi, S.**, MA (Brandeis), PhD (Michigan), Graduate Advisor, Mathematics

**Gu, H.**, MSc (Peking), PhD (Hong Kong)

**Iron, D.**, MSc, PhD (UBC)

**Irwin, A.**, MSc (CBU), PhD (Queen's)

**Janssen, J.C.M.**, MSc (Eindhoven), PhD (Lehigh)

**Kolokolnikov, T.**, MSc, PhD (UBC)

**Mills Flemming, J.**, MSc (TUNS), PhD (Dalhousie), Graduate Advisor, Statistics

**Milson, R.**, MSc, PhD (McGill)

**Pronk, D.**, MSc, PhD (Utrecht)

**Selinger, P.**, PhD (U Pennsylvania), Director of Mathematics

**Smirnov, R.**, BSc (Kyiv), PhD (Queen's)

**Smith, B.**, MSc (Calgary), PhD (Berkeley)

**Susko, E.**, PhD (Waterloo)

### Associate Professors

**Fraser, A. J.**, MSc (Toronto), PhD (Princeton)

**Kenney, T.**, BA (Hons), MMath, PhD (Cambridge)

### Assistant Professors

**Eswarathasan, S.**, PhD (Rochester)

**Ho, L.**, PhD (University of Wisconsin)

**Johnson-Freyd, T.**, BSc (Stanford), PhD (Berkeley)

**Ross, N.J.**, PhD (Dalhousie)

### University Teaching Fellows

**Sarhan, A.**, PhD (Gdansk)

## Mathematics

Location:

Chase Building  
6316 Coburg Road  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-2572

Fax Number: (902) 494-5130

## Introduction

The department offers programs leading to the degrees of MSc and PhD in the following areas: algebra, algebraic topology, applied mathematics, category theory, combinatorics, combinatorial game theory, commutative algebra, differential equations, differential geometry, functional analysis, general relativity and cosmology, graph theory, harmonic analysis, logic, number theory, wavelet theory.

## Staff

### Chair of Department

**Janssen, J.C.M.**, MSc (Eindhoven), PhD (Lehigh)

### Director of Division

**Selinger, P.**, PhD (U Pennsylvania)

### Graduate Coordinator

**Faridi, S.**, MA (Brandeis), PhD (Michigan)

### Professors

**Brown, J.**, MSc, PhD (Toronto)

**Coley, A. A.**, PhD (London)

**Dilcher, K.**, PhD (Queen's)

**Faridi, S.**, MA (Brandeis), PhD (Michigan)

**Iron, D.**, MSc, PhD (UBC)

**Irwin, A.**, MSc (CBU), PhD (Queen's)

**Janssen, J.C.M.**, MSc (Eindhoven), PhD (Lehigh)

**Kolokolnikov, T.**, MSc, PhD (UBC)

**Milson, R.**, MSc, PhD (McGill)

**Pronk, D.**, MSc, PhD (Utrecht)

**Selinger, P.**, PhD (U Pennsylvania)

**Smirnov, R.**, BSc (Kyiv), PhD (Queen's)

### Associate Professor

**Fraser, A. J.**, MSc (Toronto), PhD (Princeton)

### Assistant Professors

**Eswarathasan, S.**, PhD (Rochester)

**Johnson-Freyd, T.**, BSc (Stanford), PhD (Berkeley)

**Ross N.J.**, PhD (Dalhousie)

## Admissions Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. Candidates will normally be expected to hold a degree recognized by Dalhousie University as the equivalent of a Bachelor's degree with Honours in one of its own faculties. TOEFL scores or equivalent English Language Competency tests as listed in the graduate calendar are required for applicants whose native language is not English. Official scores from the appropriate organization must be presented.

To ensure consideration for scholarship funds, applications should be received by December 15.

# Master of Science (MSc)

## *Requirements*

1. At least 18 credit hours, not including seminar courses, at the graduate level to be chosen in consultation with a department adviser (i.e., a potential supervisor or the graduate coordinator). In addition, students whose preparation in a particular area of mathematics is deficient will be required to complete appropriate courses which will be designated by the adviser.
2. Attendance and participation in a seminar.
3. A satisfactory thesis.
4. Students are required to give an oral presentation (defence) of their thesis and at that time to answer questions about the thesis. This presentation will be made after the thesis is in the hands of the student's committee and will be taken into account when the committee makes its decision.

# Doctor of Philosophy (PhD)

## *Requirements*

1. At least 12 credit hours
2. Comprehensive examinations which must be successfully completed within 16 months (non-specialist) and 24 months (specialist) of registration in the program.
3. Attendance and participation in an appropriate seminar.
4. Preparation and defence of a satisfactory research thesis.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **MATH 5001 AARMS Summer Course I**

CREDIT HOURS: 3

This course is to be offered by and completed at an AARMS Summer School hosted at an Atlantic University. To register you must have permission from the Graduate Coordinator.

CROSSLISTED: MATH 4001

### **MATH 5002 AARMS Summer Course II**

CREDIT HOURS: 3

This course is to be offered by and completed at an AARMS Summer School hosted at an Atlantic University. To register you must have permission from the Graduate Coordinator.

CROSSLISTED: MATH 4002

### **MATH 5010 Introduction to Measure Theory and Integration**

CREDIT HOURS: 3

Lebesgue's theory of measure and integration. The topics include: sigma-algebras, measures, construction of measures, Lebesgue measure on the real line, measurable functions, the Lebesgue integral and convergence theorems,  $L_p$  spaces, signed and complex measures, decomposition of measures and the Lebesgue-Radon-Nikodym theorem, product measures and the Fubini-Tonelli theorem.

CROSSLISTED: MATH 4010.03

### **MATH 5020 Analytic Function Theory**

CREDIT HOURS: 3

Topics include: review of analytic complex functions including topological properties of the plane, Mobius mappings, exponential, logarithmic, trigonometric and related functions, integration and the Cauchy theorem. Cauchy's integral formula, residues, harmonic functions, analytic continuation, entire and meromorphic functions, some results of conformal mapping, including the Riemann mapping theorem.

CROSSLISTED: MATH 4020.03

### **MATH 5025 Commutative Algebra**

CREDIT HOURS: 3

This introduction to commutative algebra includes a selection of the following topics: prime and maximal ideals, primary decomposition, Noetherian rings, Hilbert's Basis Theorem and the Nullstellensatz.

CROSSLISTED: MATH 4025.03

### **MATH 5035 Topics in Commutative Algebra**

CREDIT HOURS: 3

This course covers special topics in Commutative Algebra.

### **MATH 5045 Advanced Algebra I**

CREDIT HOURS: 3

Introduction to module theory: modules, submodules, quotient modules, module homomorphisms, generators for modules, direct sums, free modules, tensor products, exact sequences, projective modules, injective modules and flat modules. Modules over principal ideal domains. Additional topics may include homological algebra, Ext and Tor functors, symmetric and exterior algebras.

CROSSLISTED: MATH 4045.03

### **MATH 5055 Advanced Algebra II**

CREDIT HOURS: 3

Field theory, field extensions, Galois theory and applications.

CROSSLISTED: MATH 4055.03

### **MATH 5065 Algebraic Geometry**

CREDIT HOURS: 3

This is a first course in algebraic geometry and will introduce students to the basic properties of affine and projective varieties. Topics covered will include a selection from: local properties of plane curves, elliptic curves, Bezout's Theorem, Riemann-Roch Theorem.

CROSSLISTED: MATH 4065.03

### **MATH 5066 Advanced Statistical Theory I**

CREDIT HOURS: 3

This course, together with STAT 5067.03 provides a solid basis in the theory of statistical inference. After a review of some probability and distribution theory, the Bayesian and classical theories of estimation and testing are introduced.

CALENDAR NOTES: Please see course description for STAT 5066 for more details.

CROSSLISTED: MATH 4066.03, STAT 4066.03/5066.03.

### **MATH 5070 Algebraic Number Theory**

CREDIT HOURS: 3

An introduction to algebraic number theory, with special emphasis on quadratic and cyclotomic fields. A more general study of rings of integers of algebraic number fields focuses on divisibility properties. Other topics include Dedekind domains, ideals and their factorization into prime ideals, and class groups and class numbers.

CROSSLISTED: MATH 4070.03

### **MATH 5135 Introduction to Category Theory**

CREDIT HOURS: 3

Categories, functors, natural transformations and adjointness are introduced with emphasis on examples drawn from undergraduate Mathematics and theoretical Computer Science. The calculus of diagram chasing, limits, colimits and Kan extensions is explored in detail.

CROSSLISTED: MATH 4135.03

### **MATH 5136 Topics in Category Theory**

CREDIT HOURS: 3

Topics of current interest in category theory will be discussed with an emphasis on open problems. No previous knowledge of category theory is required. The necessary concepts will be discussed in the context of their applications. However, a certain familiarity with the basic concepts of modern mathematics such as found in courses on algebra and topology would be an asset.

CROSSLISTED: MATH 4136.03

### **MATH 5140 Introduction to Functional Analysis**

CREDIT HOURS: 3

An introduction to the basic principles of functional analysis including the following topics: infinite dimensional vector spaces, normed spaces, inner-product spaces, Banach and Hilbert spaces, linear and continuous linear functionals, the Hahn-Banach Theorem, the principle of uniform boundedness, dual spaces, weak\* topology, and the Alaoglu theorem, the open mapping and closed graph theorems, and consequences and applications.

CROSSLISTED: MATH 4140.03

### **MATH 5165 Mathematical Methods in Physics**

CREDIT HOURS: 3

Complex variables and applications including solutions to Laplace equation, ideal fluid flow and Joukowski airfoil. Fourier series and generalizations; separation of variables; completeness. Green's functions in one and two dimensions. Asymptotic evaluation of integrals and special functions. Plus, some additional topics in mathematical physics.

CROSSLISTED: MATH 4165.03, PHYS 4160.03/5160.03

### **MATH 5170 General Topology**

CREDIT HOURS: 3

An introduction to topological spaces that includes the following topics: classification in terms of cardinality of bases, separation, etc., product spaces, Tychonoff theorem, compactness, compactifications, Tychonoff spaces, metrization.

CROSSLISTED: MATH 4170.03

### **MATH 5180 Introduction to Algebraic Topology**

CREDIT HOURS: 3

An introduction to algebraic topology including the following topics: the definitions, properties and methods of computation of the fundamental group of a topological space; simplicial, singular and cellular homology groups; basic properties and methods of computation of homology groups; a selection of application such as the classification of surfaces and fixed-point theorems.

CROSSLISTED: MATH 4180.03

### **MATH 5190 Ordinary Differential Equations**

CREDIT HOURS: 3

A graduate-level introduction to ordinary differential equations. Topics covered include flows, existence and uniqueness theorems, continuity of solutions, coordinate transformations, symmetry methods and reductions, linearization of dynamical systems, and ODEs on manifolds.

CROSSLISTED: MATH 4190.03



### **MATH 5200 Ordinary Differential Equations - Qualitative Theory**

CREDIT HOURS: 3

Qualitative theory is concerned with determining the behaviour of solutions of differential equations without finding explicit solutions. Topics are selected from Liapunov stability theory, stable and unstable manifolds of singular points and periodic solutions, classification of plane singular points, structural stability, and Hamiltonian systems. Other topics at the instructor's discretion.

CROSSLISTED: MATH 4200.03

### **MATH 5220 Introduction to Partial Differential Equations**

CREDIT HOURS: 3

This course is a basic introduction to the theory of partial differential equations. Topics covered include: modelling physical systems, method of characteristics, Laplace, wave and heat equations, separation of variables, eigenfunction expansions, integral transforms, maximum principles and Ritz Raleigh theory.

CROSSLISTED: MATH 4220.03

### **MATH 5230 Partial Differential Equations**

CREDIT HOURS: 3

This course will provide students with an introduction to advanced topics in partial differential equations in a variety of settings. Topics may include: reaction diffusion systems, pattern formation, numerical methods, applications to physical sciences, variational methods, Sobolev Theory.

CROSSLISTED: MATH 4230.03

### **MATH 5250 Asymptotic Analysis**

CREDIT HOURS: 3

Most mathematical models of physical systems cannot be solved exactly. Often such systems have a naturally occurring small parameter which may be exploited using asymptotic analysis techniques. In this course, we will study a variety of physical systems which illustrate many of the common approaches used in asymptotic analysis. Focus will be on applications to ordinary and partial differential equations.

CROSSLISTED: MATH 4250.03

### **MATH 5320 Combinatorial Optimization**

CREDIT HOURS: 3

Various graph algorithms will be presented and analyzed. Specifically, we will treat the algorithms for the problems: minimum spanning tree, shortest path, maximal flow, minimum cost flow, maximum matching. For each problem, various algorithms will be presented and compared. The link with Linear Programming, especially LP-Duality, will receive special attention.

PREREQUISITES: Some knowledge of linear programming and the theory of algorithms is recommended.

CROSSLISTED: MATH 4320.03

### **MATH 5330 Topics in Graph Theory**

CREDIT HOURS: 3

This course is intended for math and computer science students. Items to be selected from the following topics: graphs and matrices, graphs and groups, network analysis, extremal graph theory, enumeration problems, and algebraic methods in graph theory.

CROSSLISTED: MATH 4330.03, CSCI 4115.03

### **MATH 5331 TOPICS IN COMBINATORICS**

CREDIT HOURS: 3

This course will cover current research in combinatorics. Selected topics may include: graph polynomials, simplicial complexes, partial orders, enumeration problems and algebraic methods in combinatorics.

PREREQUISITES: Familiarity with basic graph theory (materials covered in Math 3330/CSCI 3110) is recommended.

EXCLUSIONS: MATH 4331

FORMATS: Lecture

### **MATH 5340 Discrete Random Structures**

CREDIT HOURS: 3

This course will cover basics of probability and stochastic processes, and then focus on areas where probability and combinatorics interact. Topics include: probabilistic method, stochastic graph models for complex networks, probabilistic algorithms. Probabilistic techniques include: expectation and concentration of random variables, stochastic processes, conditional expectation, Markov chains, martingales, branching processes.

CROSSLISTED: MATH 4340.03

### **MATH 5360 Combinatorial Modelling**

CREDIT HOURS: 3

This course introduces a common framework for combinatorial structures (graphs, digraphs, hypergraphs, posets, preorders, lattices, finite topologies, simplicial complexes), with an emphasis on how to model these structures with other fields of mathematics, such as matrix theory and linear algebra, commutative algebra, topology, analysis, probability, and logic.

CROSSLISTED: MATH 4360.03

### **MATH 5410 Cosmology**

CREDIT HOURS: 3

A self-contained introduction to cosmology will be given and no prior knowledge of differential geometry or general relativity will be assumed (although some knowledge of elementary differential equations will be useful). A cosmological model is a model of the universe, as a whole, on the largest scales; the emphasis of the course will be on the modelling aspects of cosmology.

CROSSLISTED: MATH 4410.03, PHYC 4660.03/5660.03

### **MATH 5500 Introduction to Harmonic Analysis**

CREDIT HOURS: 3

This course will cover the basic elements of  $L_p$ -spaces, convolution, interpolation, maximal functions, Fourier analysis of functions, and the theory of generalized functions, or distributions. Further topics may include  $L_2$ -Sobolev spaces, boundary values of harmonic functions, spherical harmonics, singular integral operators, or multipliers.

CROSSLISTED: MATH 4500.03

### **MATH 5530 Differential Geometry**

CREDIT HOURS: 3

This course is a self-contained introduction to manifold theory. Topics include: elements of surface theory, the tangent space, vector fields, differential forms and more general tensors, the Lie derivative, connections, Riemannian geometry, applications in mechanics and general relativity.

CROSSLISTED: MATH 4530.03

### **MATH 5540 Applied Analysis**

CREDIT HOURS: 3

This course is an introduction to the methods of modern applied analysis. Topics include: Fourier series, tensor calculus, and the calculus of variations. The course is suitable for advanced undergraduates and the graduate students specializing in applied mathematics, relativity, differential geometry, and differential equations.

CROSSLISTED: MATH 4540.03

### **MATH 5650 General Relativity**

CREDIT HOURS: 3

A review of differential geometry will be given followed by an introduction to the general theory of relativity. Various topics will be discussed, including: linearized theory and gravitational radiation, spherically symmetric metrics and the Schwarzschild solution, gravitational collapse, black holes, and cosmology.

CROSSLISTED: MATH 4650.03, PHYC 4650.03/5650.03

### **MATH 5660 Theory of Computation**

CREDIT HOURS: 3

This is a course on formal languages and computational models. Topics covered include finite automata, pushdown automata, Turing machines,

undecidability and recursive and recursively enumerable functions. Some applications to computer science are also discussed such as compiler design and text processing.

CROSSLISTED: MATH 4660.03, CSCI 4112.03

### **MATH 5680 Topics in Logic and Computation**

CREDIT HOURS: 3

This course covers topics of current interest in logic and/or the foundations of computation. Suitable topics include: formal logic, soundness and completeness, Gödel's incompleteness theorem, formal set theory, the Zermelo-Fraenkel axioms, non-standard models, independence of axioms, lambda calculus and foundations of functional programming languages, proof theory, semantics.

CROSSLISTED: MATH 4680.03

### **MATH 5900 Combinatorial Game Theory**

CREDIT HOURS: 3

This course looks at two-player games of strategy where there are no chance devices and both players have perfect information. The surprising mathematical structure underlying these games will be introduced along with the evaluation scheme and its application to specific games in the classes of hot, all-small and impartial games.

CROSSLISTED: MATH 4900.03

### **MATH 7030 Category Theory Seminar**

CREDIT HOURS: 0

Weekly seminars focused on topics in Category Theory.

CALENDAR NOTES: Students are expected to register in this course each term, receiving a grade of IP until all course requirements are completed.

### **MATH 7050 Combinatorics and Game Theory Seminar**

CREDIT HOURS: 0

Weekly seminars focused on topics in Combinatorics and Game Theory.

CALENDAR NOTES: Students are expected to register in this course each term, receiving a grade of IP until all course requirements are completed.

### **MATH 7060 Relativity Seminar**

CREDIT HOURS: 0

Weekly seminars focused on topics in Relativity.

CALENDAR NOTES: Students are expected to register in this course each term, receiving a grade of IP until all course requirements are completed.

### **MATH 7190 Analysis Seminar**

CREDIT HOURS: 0

Weekly seminars focused on topics in Analysis.

CALENDAR NOTES: Students are expected to register in this course each term, receiving a grade of IP until all course requirements are completed.

### **MATH 7400 Applied Math Seminar**

CREDIT HOURS: 0

Weekly seminars focused on topics in Applied Math.

CALENDAR NOTES: Students are expected to register in this course each term, receiving a grade of IP until all course requirements are completed.

### **MATH 9000 Master's Thesis**

CREDIT HOURS: 0

## **MATH 9520 Comprehensive Examinations**

CREDIT HOURS: 0

A passing grade in this course indicates that a PhD student has completed the comprehensive examinations requirement of the Mathematics PhD program. This course must be passed at most 16 months after the beginning of the student's program. To pass this course, a student must pass three comprehensive examinations following the procedures outlined by the department.

## **MATH 9530 Doctoral Thesis**

CREDIT HOURS: 0

# **Mechanical Engineering**

## **Programs**

### **Introduction**

Dalhousie University offers programs leading to Master's and Doctoral degrees in various branches of Engineering. There are two program areas offered within the Department of Mechanical Engineering:

- [Materials Engineering](#)
- [Mechanical Engineering](#)

## **Materials Engineering**

The Materials Engineering Program emphasizes student instruction on cutting-edge material systems and processing technologies pertinent to the aerospace, automotive, marine, and energy sectors. As one of the most research-intensive groups in the Faculty of Engineering, students are presented with opportunities to amass in-depth knowledge on a diverse scope of fields in direct collaboration with national and international industry partners. Core strengths of the Program include material design, advanced manufacturing (additive manufacturing, powder metallurgy, sintering, metal forming, brazing and joining), and material characterization (thermal analyses, tribology, corrosion and oxidation, mechanical testing, quantitative microstructural analysis) principally in the context of structural alloy systems, ceramics, fiber-reinforced composites, shape memory alloys, and metal/ceramic composites.

## **Mechanical Engineering**

Graduate studies in Mechanical Engineering at Dalhousie University is designed to help students develop and strengthen understanding of their selected specialty in Mechanical Engineering through research work, lectures, tutorials, and laboratory activities. Modern, well-instrumented laboratories provide experience to ensure a thorough understanding and appreciation of the subject matter. The department offers graduate research opportunities in most cutting-edge fields of Mechanical.

## **Staff**

### **Dean**

**Newhook, J.**, BEng, MSc (TUNS), PhD (Dalhousie), PEng

### **Associate Dean**

**Little, T.**, BSc (Eng) (UNB), MEng (Memorial), PhD (UNB), PEng, Undergraduate and Associated Universities

**Plucknett, K.**, BSc, PhD (Warwick), Research

### **Assistant Dean**

**El-Sankary, K.**, BEng (LU), MSc (Quebec), PhD (Ecole Polytechnique), Student Affairs

**Ghanem, A.**, BSc (Eng) (UNB), PhD (Cornell), Diversity and Inclusion

### **Graduate Admissions Officer**

**Hillyard, H.**, BA (Dalhousie)

## Department Head

**Doman, D. A.**, BSc, MSc (Waterloo), PhD (Dalhousie), PEng

## Graduate Co-ordinator

**Taheri, F.** BEng, MSc, PhD (TUNS), PEng

## Administrative Assistants

Phone: (902) 494-3989

Email: [mech.admin@dal.ca](mailto:mech.admin@dal.ca)

Website: [www.dal.ca/faculty/engineering/mechanical.html](http://www.dal.ca/faculty/engineering/mechanical.html)

## Professors

**Allen, P. L.**, BSc (Mt. A), BEng (TUNS), MSc (UWO), PhD (TUNS), PEng. Solar thermal energy utilization, heat exchangers, heat transfer.

**Bauer, R. J.**, BSc (Waterloo), PhD (Toronto), FEC, PEng. Dynamics and control, grinding

**Bishop, D. P.**, BEng, MSc, PhD (TUNS), PEng. Additive manufacturing of metallic materials, powder metallurgy, powder forging, design/development of aluminum alloys, and metal matrix composites.

**Corbin, S. F.**, BEng, MSc (TUNS), PhD (McMaster), PEng. NSERC/Pratt and Whitney Canada Industrial Research Chair in Structural Brazing and Processing of Powder Metallurgy Superalloys. Sintering, brazing, aerospace materials, structure and properties of engineering materials, physical metallurgy, materials characterization techniques (XRD, SEM, TEM) and materials and manufacturing.

**Farhat, Z.**, BSc, MSc, PhD (Windsor), PEng. Wear, friction, tribology, advance materials, and coatings. .

**Groulx, D.**, BSc, PhD (Sherbrooke), PEng. Phase change and applied heat transfer, energy storage, temperature control, tidal energy and fluid mechanics, numerical modeling.

**Hubbard, T.**, BSc (Dalhousie), BEng (TUNS), PhD (CalTech), PEng. MEMS - Micro Electromechanical Systems. Undergraduate Coordinator.

**Kalamkarov, A. L.**, BSc, MSc, PhD (Moscow State), DSc (Acad Sci., USSR), PEng. Stress and strength analysis, modeling, design and optimization of composite materials and smart structures.

**Pan, Y. J.**, BEng (Yanshan) MEng (Zhejiang), PhD (NUS, Singapore), PEng. Advanced Control, Intelligent Robotics, Cyber Physical Systems, Teleoperation, Collaborative Robots, Haptics.

**Plucknett, K. P.**, BSc, PhD (Warwick). Structural and functional ceramics, intermetallics, fibre-reinforced composites, electron microscopy, material processing, mechanical properties, biopolymers.

**Swan, L.**, BSc (Cal Poly), MSc, PhD (Dalhousie), PEng. Energy storage, renewable energy, electric vehicles, energy demand analysis, building performance modeling and simulation, building controls.

**Taheri, F.**, BEng, MSc, PhD (TUNS), PEng, Advanced composite materials, finite element methods (linear & nonlinear), fracture mechanics and fatigue, impact and stability of structures, Graduate Co-ordinator.

**Ugursal, V. I.**, BSc (Bogazici), MEng, PhD (TUNS), PEng. Modeling of residential energy consumption, energy conversion and conservation. Recruitment Coordinator.

**Warkentin, A.**, BEngMgt, MEng (McMaster), PhD (Waterloo), PEng CAD/CAM grinding, 5-axis machining, Graduate Seminar Coordinator.

**Yemenidjian, N. B.**, BEng, PhD (Concordia), PEng. Electronic materials, hard materials, ceramics, and glasses.

## Associate Professors

**Doman, D. A.**, BSc, MSc (Waterloo), PhD (Dalhousie), PEng. Solid mechanics, powder metallurgy compaction, finite element modeling.

**Johnston, C. R.**, BSc, MSc (Alberta), PhD (Calgary), PEng, FCEEA. NSERC Chair in Design Engineering.

**Seto, M.**, BSc, MSc, PhD (UBC), PEng. [Irving Chair in Marine Engineering and Autonomous Systems](#). Autonomy for robotic systems, localization and mapping, multi-robot collaboration, fault tolerance, embedded programming, vehicle dynamics and control.

## Assistant Professors

**Nasiri, A.**, BSc, MSc (Sharif University of Technology), Ph.D. (Waterloo), Canada Research Chair II in Ocean Engineering. Metal additive manufacturing, wire arc additive manufacturing, corrosion, multi-scale characterization of microstructure, mechanical properties.

## **Adjunct (FGS)**

**Caley, W. F.**, BSc (Eng), MSc (Eng) (Queen's), PhD (Toronto), PEng

**Donaldson, I.**, BSc (Univ of Michigan), MSc (Worcester Polytechnic Institute)

**Joseph, A.**, BSc (St. FX), MSc (NSAC), PhD (Dalhousie)

**Kipourou, G. J.**, DiplEng (NTU Athens), MSc, PhD (Toronto), PEng

**Mahallati, A.**, BEng (Marine Eng), MSc (Dalhousie), PhD (Carleton)

**Nolting, A.**, BASc (Waterloo), MSc, PhD (Royal Military College)

## **GENERAL INFORMATION**

### **Application Forms**

Application forms may be obtained through the university's Admissions, Graduate Admissions website.

Prospective students are encouraged to contact the Faculty of Engineering Graduate Admissions Officer for admission information. Send graduate application and all documents pertaining to admissions for Mechanical and Materials Engineering are to:

Heather Hillyard  
Graduate Admissions and Recruitment Coordinator  
Faculty of Engineering  
5217 Morris Street, O'Brien Hall, 4th Floor  
PO Box 15000  
Halifax, NS B3H 4R2 Canada

Email: [grs@dal.ca](mailto:grs@dal.ca) Phone: 902-494-1288

### **English Language Proficiency Requirement**

Information pertaining to the English language proficiency requirements is given in the Faculty of Graduate Studies Regulations Section 3.4.

### **Fees**

Information pertaining to fees and expenses can be found online in the Admissions section of the Dalhousie Website.

### **Financial Assistance**

Information pertaining to financial assistance and scholarships can be found online in the Funding Opportunity section of the Dalhousie – Faculty of Graduate Studies Website.

### **Health Insurance Requirement**

Information pertaining to health insurance requirements is given in the Resources and Services section of the Dalhousie Graduate Calendar.

### **Graduate Student Program**

The graduate student's program, including supervisory committee composition, will be entered in the Graduate Student Information System (GSIS) by the department and approved by the supervisor, the graduate coordinator and FGS. The details of the program should be submitted in the first month after initial registration. The composition of the supervisory committee should be entered by the end of the second term.

### **Course Requirement**

At least three-quarters (75%) of the total course requirement for each graduate program must be taken at Dalhousie University.

### **Leave of Absence**

Students may formally apply for a leave of absence in accordance with Faculty of Graduate Studies Regulations, Section 5.8.

## **MASTER'S DEGREES**

A student's program of study for the Master's degree may be either a research-intensive program (MSc) or a coursework intensive program (MEng). Note that a thesis-based research Master's degree is normally required to gain admission into the PhD program.

### **MASTER OF APPLIED SCIENCE (MSc)**

### **Admissions Requirements**

A candidate to be considered for the Master of Applied Science research program must have obtained, with a high scholastic standing, an undergraduate degree in engineering or a degree in science with honours, or the equivalent, from a recognized university.

Candidates must also be recommended for admission by a faculty member in the Program in order for their application to proceed. Please note a recommendation for admission is not a formal acceptance.

Candidates for the above degree may be required to take additional undergraduate subjects as a preparation for advanced courses or to give the candidate a suitable engineering background. Such subjects are seldom considered as part of the graduate program.

### **Academic Regulations**

#### **Program Requirements**

A MASc graduate program consists of not less than 12 credit hours of coursework, the graduate seminar and thesis selected upon the advice of the thesis supervisor. Not more than one senior level undergraduate course may be taken as part of the 12-credit hour requirement.

#### **Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least one seminar presentation.

#### **Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the thesis supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

#### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses.

Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate-level courses and any approved undergraduate course, with a grade of at least B-. Graduate students are permitted to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

As well, all Master's degree candidates must pass an oral examination of their thesis or project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

#### **Time Requirement**

The minimum time required for completing a Master's program is twelve months. All students are required to register each term to maintain eligibility to continue a program of studies. Students are required to be on campus for at least two terms in the first year of their program. See Faculty of Graduate Studies Regulations, Section 7, for policies regarding the maximum length of time for degree completion and extensions.

### **MASTER OF ENGINEERING (MEng)**

#### **Admission Requirements**

A candidate to be considered for the Master of Engineering course work program must have obtained an undergraduate degree in engineering or its equivalent with high scholastic standing from a recognized university.

Candidates must also be recommended for admission by a faculty member in the Program in order for their application to proceed. Please note a recommendation for admission is not a formal acceptance.

## **Academic Regulations**

### **Program Requirements**

A MEng graduate program consists of not less than 21 credit hours coursework, the graduate seminar, and the 6 credit hours project. Undergraduate courses, in the area of a student's interest, not taken by the student for previous credit, may be included in the program, subject to prior approval. Not more than 6 credit hours may be undergraduate credit hours.

A project is required as a part of the program (six credit hours out of the required 27 credit hours). Projects require the appointment of a supervisor and one supervisory committee member.

### **Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least one seminar presentation.

### **Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the project supervisor (and co-supervisor) and at least one other member with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses, and any approved undergraduate courses, with a grade of at least B-. Graduate students are permitted to repeat only one course during their program in the Faculty of Engineering. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

As well, all MEng degree candidates must pass an oral examination of their project after it has been submitted in satisfactory form.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### **Time Requirement**

The minimum time required for completing a Master's program is twelve months. All students are required to register each term to maintain eligibility to continue a program of studies. Students are required to be on campus for at least two terms in the first year of their program. See Faculty of Graduate Studies Regulations, Section 7, for policies regarding the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for Master's Theses and Projects**

1. The thesis/project report is to be prepared to conform with the standards of the Faculty of Graduate Studies.
2. To initiate the thesis/project defence, the form "Appointment for an Oral Examination & Thesis Submission Form – Master's Programs" must be submitted to the departmental Office at least 10 business days prior to the date of the oral defence. The department will coordinate the scheduling of the presentation and examination and assign a chair/moderator. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:
  - i) Course work completed;
  - ii) Seminar completed;
  - iii) Supervisory committee approved.

## **DOCTOR OF PHILOSOPHY (PhD)**

### **Admission Requirements and Procedures**

A candidate to be considered for entrance into the PhD program must meet the admission requirements of the Faculty of Graduate Studies and must have:



- A research Master's Degree in engineering from Dalhousie University or any other recognized university, or a Master of Science Degree or its equivalent from a recognized university, acceptable to the Faculty of Engineering (in which case, a candidate may be required to take extra subjects to provide a suitable engineering background); or,
- Acceptance for registration as a candidate for a research Master's degree at this University.

An application for admission to the graduate program leading to the degree of Doctor of Philosophy should have a superior academic record and previous training or experience which indicates that the candidate should be able to do independent research.

Candidates must also be recommended for admission by a faculty member in the Program for their application to proceed. Please note a recommendation for admission is not a formal acceptance.

Doctoral candidates are not admitted without appropriate funding to support the student and the program of research.

### **Admission from Master's Degree**

A candidate registered in a MASc Degree in the department may be transferred to a PhD Degree on the recommendation of their supervisory committee, according to the Regulations of the Faculty of Engineering. The recommendation will be reviewed by the Faculty of Engineering Graduate Studies Committee (GSC) and transmitted to the Faculty of Graduate Studies.

### **Academic Regulations**

All doctoral programs are developed under the regulations and procedures of the Faculty of Graduate Studies (see Faculty of Graduate Studies Regulations) and each program must be approved by the Faculty of Engineering and the Faculty of Graduate Studies.

### **Program Requirements**

A PhD graduate program consists of a minimum of 12 credit hours coursework, the graduate seminar, comprehensive exam and thesis selected upon the advice of the thesis supervisor. No undergraduate courses are allowed for credit in a Doctoral Degree program.

Granting of credits to a student's program of studies for courses taken prior to commencement of the program requires the recommendation of the Department and approval of the Faculty of Engineering Graduate Studies Committee. A request for this transfer of credits must be made to the Department before the student's first registration or in the first term.

### **Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as making at least two seminar presentation.

### **Supervisor and Supervisory Committee**

The Supervisory Committee will consist of the thesis supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with special interests in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

### **Thesis Subject Matter and Supervision**

The thesis shall consist of an original investigation or design carried out under the immediate supervision of a member of the Faculty of Engineering who is also a member of the Faculty of Graduate Studies.

### **Thesis Requirement**

A candidate will be required, as a major part of the program, to submit a satisfactory thesis embodying the results of original scholarship and independent research. See Faculty of Graduate Studies Regulations for information pertaining to doctoral theses.

### **Examination Requirements**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

A PhD degree candidate must pass all graduate-level courses with a grade of at least B- and cannot carry a course failure. Graduate students are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis.

PhD candidates are also required to pass a comprehensive examination which normally take place within the fourth study term.

As well, all PhD degree candidates must pass an oral examination of their thesis project after it has been submitted in satisfactory form, and in accordance with the Faculty of Graduate Studies Regulations.

In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### **Comprehensive Examination**

The Supervisory Committee shall be responsible for conducting the comprehensive examinations.

The purpose of the comprehensive examination is to ensure that the candidate has a thorough understanding of the chosen field of study as a whole, has attained knowledge to an adequate level in the discipline and evaluate their suitability to begin Ph.D. level thesis research.

The comprehensive examination consists of at least two written examinations and an oral examination conducted to meet the above objective. The comprehensive examination shall normally be started within the fourth session of study from first registration. A student shall be given at least three months' notice of the examination. The topics and results of the examination will be conveyed to PhD Candidate Home Department's Graduate Coordinator on the prescribed form and will indicate "pass", "fail", or "re-examination". The results to be added to the student's transcript.

Recommendation of the examining committee to re-examine shall only be permitted if the failure was marginal. The re-examination of marginal students must be carried out within six months of the initial examination. Students requiring re-examination shall not necessarily be required to rewrite both written examinations. Students given the opportunity to rewrite shall only be permitted to rewrite once.

Students receiving a recommendation of "fail" will be academically dismissed from the program (see FGS regulations about dismissal).

More details on Comprehensive Exams can be found in Appendix-B of Faculty of Engineering "Graduate Studies Handbook".

### **Time and Residence Requirements**

A student is required to register each term to maintain eligibility to continue their program of studies. See Faculty of Graduate Studies Regulations, for policies regarding residency requirements and the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for PhD These Defences**

An Examining Committee is appointed in accordance with the Faculty of Graduate Studies procedures prior to the formal submission of the thesis. The Examining Committee consists of the Supervisory Committee and an external examiner recommended to FGS by the Supervisory Committee. The External Examiner will be approached and appointed by the Faculty of Graduate Studies according to Faculty procedures.

A copy of the thesis must be submitted to the Faculty of Graduate Studies at least six weeks prior to the date of the oral defence. The copy will be sent to the External Examiner. The copy must be accompanied by the appropriate form. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:

- Course work completed;
- The graduate seminar requirement completed;
- Comprehensive examination passed;
- Examining Committee established;
- A written report has been received by the Faculty of Graduate Studies from the external examiner.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current timetable for this year's offering. For further information please contact the department.

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Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **MATL 6010 Introduction to Transmission Electron Microscopy**

CREDIT HOURS: 3

This course will deal with transmission electron microscopy including the basic principles and methods of operation of the electron microscope, the elements of electron optics, and the kinematical theory of electron diffraction and image formation. Replica methods, extraction and thin film techniques and applications of transmission electron microscopy to the study of metallic and non-metallic solids will be discussed. Laboratory work will provide students with a working knowledge of the transmission electron microscope.

### **MATL 6011 Introduction to the SEM and Microprobe**

CREDIT HOURS: 3

This course will deal with scanning electron microscopy and with electron microprobe analysis. The electron optics of the scanning electron microscope and of the electron beam microprobe will be discussed. Electron/ specimen interactions will be studied including the excitation and absorption of X-rays. Correction techniques necessary for quantitative microanalysis and applications of the microprobe to the solution of materials problems will be discussed. Laboratory work will give students a working familiarity with the scanning electron microscope. A laboratory fee is applicable to this course.

### **MATL 6014 Welding Metallurgy**

CREDIT HOURS: 3

This course will cover the effect of mass and heat flow, for the various joining processes, on the metallurgical properties of the parent and weld metal. The processes will include brazing, soldering, solid phase welding and fusion welding for the major classifications of metals such as carbon and alloy steels and non-ferrous metals. This course will include laboratory periods designed to reinforce the lecture material.

PREREQUISITES: Bachelor Mathematics & Heat Transfer or Instructor's permission necessary.

FORMATS: Lecture

### **MATL 6015 High Temperature Metallurgical Operations Part I**

CREDIT HOURS: 3

The course will consist of a review of metallurgical thermodynamics, with reference to various metallurgical operations. It will also include reference to slag theory, as well as experimental techniques used in high temperature metallurgical research.

### **MATL 6016 High Temperature Metallurgical Operations Part II**

CREDIT HOURS: 3

The course will consist of a survey of the factors which affect the kinetics of high temperature heterogeneous processes and their effect on the rate of various pyrometallurgical operations.

**MATL 6017 Hydrometallurgical Operations**

CREDIT HOURS: 3

New developments in the leaching, solution purification, and recovery of metals will be studied as they apply to the extraction of metals from various feed materials by hydrometallurgical processes.

**MATL 6018 Structural Physical Metallurgy**

CREDIT HOURS: 3

An advanced study of certain topics such as solidification, imperfections in crystals, recovery, recrystallization and grain growth, and solid-state transformations. The course content will be adapted to the interest of the student as far as possible. Weekly seminars will be held.

**MATL 6019 Selected Topics in Extractive Metallurgy**

CREDIT HOURS: 3

This course is given by a visiting professor. The topic of the lectures is in the field of specialization of the lecturer.

**MATL 6020 Selected Topics in Physical Metallurgy**

CREDIT HOURS: 3

This course is given by a visiting professor. The topic of the lectures is in the field of specialization of the lecturer.

**MATL 6021 Selected Topics in Mineral Processing**

CREDIT HOURS: 3

This course is given by a visiting professor. The topic of the lectures is in the field of specialization of the lecturer.

**MATL 6022 Directed Studies in Metallurgical Engineering**

CREDIT HOURS: 3

This course is available to graduate students enrolled in a Masters program in Metallurgical Engineering wishing to gain knowledge in a specific area for which no graduate level course is offered. Students are assigned an advisor and are required to present a formal report at the end of the course. A maximum of one Directed Studies course may be taken for credit in a Masters degree program.

**MATL 6030 Fracture of Metallic Materials**

CREDIT HOURS: 3

This course will cover the failure of metals under ductile and brittle fracture, creep rupture and fatigue conditions. Fracture mechanics concepts will be used to quantify fracture parameters in the presence of pre-existing flaws or propagating cracks. The interaction between the various failure mechanisms, including high temperature oxidation and sulphidation, will also be discussed.

PREREQUISITES: MATL 3500.03 or MATL 3620.03 or equivalent

**MATL 6040 Advanced Process Metallurgy**

CREDIT HOURS: 3

Chemical and electrochemical processes for the extraction and refining of materials are examined in terms of chemical thermodynamics and kinetics. Selected topics will be discussed related to the behaviour of metallic, ceramic, glass and metal slag systems at high temperatures. The thermodynamic and transport properties will be discussed for a number of systems such as alloys, oxides, carbides, and silicides.

**MATL 6050 Wear of Materials**

CREDIT HOURS: 3

This course focuses on wear at the interfaces between two bodies in relative motion. Consideration is given to friction and wear behavior of metals and ceramics. Friction and wear mechanisms including adhesive, abrasive, erosive and corrosive wear are discussed in detail. Case studies are used to illustrate key points.

PREREQUISITES: Graduate student registered in Mechanical or Materials Engineering or with permission of the instructor.  
FORMATS: Lecture

### **MATL 6805 Electrochemical Processing of Materials**

CREDIT HOURS: 3

The course discusses principles of electrochemistry and electrochemical engineering as they apply to the design of processes for the production of materials. The theory and application of various electrochemical techniques such as electroplating, electroforming, electro machining, electrorefining, and fused-salt electrolysis are included. A brief overview on the development of electrochemical sensors and devices using solid state electrolytes is presented. Surface modification by electrochemical means is also discussed.

CROSSLISTED: MATL 4805.03

### **MATL 6806 Particulates in Material Eng**

CREDIT HOURS: 3

The course covers the preparation, characterization, physical and chemical properties, and processing of powders in materials processing including agglomeration, gas-solid reactions, sintering and hot pressing.

CROSSLISTED: MATL 4806.03

### **MATL 7022 Directed Studies in Metallurgical Engineering**

CREDIT HOURS: 3

This course is available to graduate students enrolled in a PhD Program in Metallurgical Engineering wishing to gain knowledge in a specific area for which no graduate level course is offered. Students are assigned an advisor and are required to present a formal report at the end of the course. A maximum of two Directed Studies courses may be taken for credit in a PhD Program.

### **MATL 8900 MEng Project**

CREDIT HOURS: 6

A Master of Engineering candidate will be required to submit a project satisfactory to the Faculties of Graduate Studies and Engineering and to make a successful oral presentation of the work.

EXCLUSIONS: MATL 8500.00

### **MATL 9000 Master's Thesis/Project**

CREDIT HOURS: 0

### **MATL 9530 PhD Thesis**

CREDIT HOURS: 0

### **MECH 6010 Manufacturing Processes**

CREDIT HOURS: 3

This course introduces the student to the fundamentals of manufacturing processes. Emphasis will be placed on metal cutting and grinding processes. Specific topics include: chip formation, cutting mechanics, tool material and geometry, temperature, heat transfer, tool wear, thermal damage, machine tool dynamics for grinding and single point machining.

FORMATS: Lecture

### **MECH 6040 Make: Engineering Prototypes**

CREDIT HOURS: 3

This course is a hands-on project-based course intended to teach the process of making engineering prototypes. A physical prototype is a requirement of this course. Students will be introduced to various technologies. Technologies may vary and may include, but are not limited to: CNC milling, 3D printing and

### **MECH 6100 Boundary Layer Theory**

CREDIT HOURS: 3

The derivation of the Navier-Stokes equations and several exact solutions are considered. The boundary layer equations and some solutions for two dimensional axially symmetric flows are treated as well as non-steady boundary layers. The integral method of solution of boundary layer equations is followed by boundary layer control. An introduction to the theory of turbulence is given.

### **MECH 6110 Turbulence in Real Fluids**

CREDIT HOURS: 3

The first part of this course deals in some detail with the theory of measurements and the analysis of random data. Statistically based functions such as turbulence intensities, correlation functions, energy spectra, are examined in relation to fluid processes. The second phase of this course examines the present level of knowledge of turbulence of fluids in rigid and visco-elastic ducts, without and with superimposed pressure gradients. Properties of real fluids are stressed, and considerable emphasis is laid upon experimental results, applying the methods of measurement and analysis outlined above. Two- and three-dimensional anemometry techniques are examined applied.

### **MECH 6120 Computational Fluid Dynamics and Heat Transfer**

CREDIT HOURS: 3

The finite difference discretization method is applied to the solution of the partial differential equations arising from the mathematical modelling of fluid flow, heat transfer and combustion processes. Items like convergence, stability, consistency, numerical diffusion, and turbulence modelling will also be presented.

### **MECH 6140 Fluidization Phenomena I**

CREDIT HOURS: 3

The physical properties of the fluidized state, the behaviour of bubbles, the flow patterns of fluids and head and mass transfer in a bubbling fluidized bed boiler reactor. Design fluidized bed equipment.

### **MECH 6142 Steam Plant Engineering**

CREDIT HOURS: 3

This course aims to provide basic fundamental and practical information to engineering students to design and operate thermal power plants. Topics covered are: classification of steam generator; comparison of water-tube and fire-tube boilers; energy sources; fuels and combustion; thermal analysis of furnaces; superheaters, economizers, and air preheaters; boiler efficiency calculations; burner, pulverizer, cyclones, fluidized beds; auxiliary equipment (fans, stacks); control system; cooling system design; environmental considerations.

EXCLUSIONS: MECH 4840.03

FORMATS: Lecture | Tutorial

### **MECH 6145 Fluidization Phenomena II**

CREDIT HOURS: 3

This course deals with industrial aspects of circulating fluidized bed and fluidized bed heat transfer. It will cover design of fluidized bed reactors, heat exchangers and boilers. Mechanical design of components such as distributor, solid-field system will be covered.

### **MECH 6200 Convection Heat Transfer**

CREDIT HOURS: 3

This course deals with advanced topics in convection heat transfer. The governing equations for forced and natural convection are derived and solved by scaling analyses. Integral and similarity solutions are also obtained for the governing equations. The development of empirical correlations for evaluating the heat transfer from commonly encountered geometries is also covered.

PREREQUISITES: MECH 3305, MECH 3705 or equivalencies or Instructor's Permission

### **MECH 6210 Radiation Heat Transfer**

CREDIT HOURS: 3

An advanced study of the transmission of heat by radiation. Topics covered include: physical properties of radiation, thermal radiation laws, characteristics of real and ideal systems, geometric shape factors, grey and non-grey system analysis, energy transfer in absorbing media and luminous gases, solar radiation.

PREREQUISITES: MECH 3705 or equivalent or instructor's permission

### **MECH 6250 Advanced Transport Phenomena**

CREDIT HOURS: 3

This course deals with advanced mathematical and physical topics in transport phenomena. Both the macroscopic and microscopic conservation laws of mass, heat and momentum transport are built and solved for analytically. Diffusion and convection physics are presented, for multi-dimensional, transient and coupled phenomena. Multiphase processes are also introduced.

PREREQUISITES: MECH 3305 & MECH 3705, or PEAS 3600, or equivalent, or instructor's permission.

CROSSLISTED: PEAS 6250

FORMATS: Lecture | Tutorial

### **MECH 6325 Micro-electro-mechanical Systems (MEMS)**

CREDIT HOURS: 3

This course deals with micro-machining and MEMS (micro-electro-mechanical systems). The following topics will be covered: scaling issues, fabrication technologies and production methods, classification and analysis of MEMS devices (both sensors and actuators). The integration of multiple devices into systems will be addressed including issues of assembly and interfacing. Micro-machining will be compared and contrasted to both micro-electronics and traditional micro-machining. The development and use of MEMS simulation and design tools will be covered.

PREREQUISITES: Approval of instructor.

### **MECH 6340 Energy Management I**

CREDIT HOURS: 3

The purpose of this course is to introduce the concepts and techniques of energy management and conservation. The subjects that will be discussed are energy supply and demand, energy pricing, scope of the energy problem and approaches to provide solutions; energy auditing; improving energy utilization in space conditioning and steam, hot water, and compressed air systems; energy saving opportunities in refrigeration and cooling systems; insulation; and electrical energy conservation. An inter-disciplinary approach will be employed in this course to provide a wider understanding of the subject.

CROSSLISTED: MECH 4340.03

RESTRICTIONS: Graduate students in Mechanical Engineering. Other disciplines subject to instructor approval.

### **MECH 6341 Energy Management - II**

CREDIT HOURS: 3

This course is a continuation of MECH 6340. The subjects that will be discussed in this course are computer technology for energy conservation; energy saving opportunities in fired heaters and boilers; cogeneration; waste heat recovery; and synthesis of heat and power networks. Although MECH6340 is not a prerequisite for this course, it is advisable that both courses are taken to have a complete coverage of the subject.

RESTRICTIONS: Graduate students in Mechanical Engineering. Other disciplines subject to instructor approval.

### **MECH 6346 Advanced Energy Storage**

CREDIT HOURS: 3

Analysis, design, and use of advanced energy storage to provide temporary decoupling of energy resources (e.g., wind, solar, tidal, geothermal) from energy demand (e.g., heating, cooling, electricity). Technologies under investigation include: batteries, latent/sensible thermal, compressed air, pumped hydro, and hydrogen. Storage duration of seconds to seasons is considered.

RESTRICTIONS: Graduate students in Mechanical Engineering. Other disciplines subject to instructor approval.

FORMATS: Lecture

### **MECH 6350 Advanced Engineering Design**

CREDIT HOURS: 3

An undergraduate education necessarily concentrates on analysis. This course focuses on synthesis. Creativity is the engine of design and analysis is the feedback governing design. Through the media of case studies, laboratory exercises, instruction, and practice, this course studies the process of design; the business of translating societal needs into real, manufacturable objects. Lecture topics will include: the hierarchical, iterative nature of design; aids to creativity; the appropriate use of analysis; the transformation from functional space to physical space; prototype design; consumer durable versus capital

equipment design; and special lectures on microprocessors in machinery, optimization, and CAD/CAM.

### **MECH 6400 Introduction to Advanced Engineering Ceramics**

CREDIT HOURS: 3

This course focuses on ceramic materials used in structural and functional engineering applications. It provides an introduction to ceramic bonding and crystal structures, various processing techniques, and the mechanical, thermal, and electrical properties of advanced ceramics. Case studies will relate the current state-of-the-art for selected ceramic systems.

PREREQUISITES: Graduate students registered in either Mechanical or Materials Engineering, or with the special permission of the instructor.

FORMATS: Lecture

### **MECH 6420 Advanced Fluid Mechanics**

CREDIT HOURS: 3

A general review of principle concepts and methods in fluid dynamics will be conducted. Advanced treatment with mathematical techniques for solving specific classes of fluid-flow problems will be introduced, including: surveys of governing equations and basis theories; two- and three- dimensional potential flows; surface waves; boundary-layer theory; and, shock-wave phenomenon.

PREREQUISITES: ENGM 4343.03 and MECH 3420.03 or equivalent.

### **MECH 6440 Principles of Marine Craft Design**

CREDIT HOURS: 3

An introduction to the basic principles of hydrostatics and hydrodynamics for surface ships, submarines, and other marine craft. Topics include: hydrostatics, stability, dimensional analysis and modelling; resistance estimation of low-speed and high speed craft, and propulsion. Students will use software tools.

CROSSLISTED: MECH 4440

FORMATS: Lecture | Lab | Tutorial

### **MECH 6500 Mechanical Vibrations**

CREDIT HOURS: 3

Free and forced vibrations of elastic bodies, such as beams, plates, and shells are examined. Response due to shock and random loading is introduced. Vibration measuring instrumentation is described and several laboratory experiments are carried out. Industrial applications are studied including vibration of machinery, ships, and the response of humans to whole body vibration.

### **MECH 6510 Advanced Mechanics of Solids**

CREDIT HOURS: 3

The course provides an introduction to the general equations of the theory of elasticity of an anisotropic solid. Elastic equilibrium and boundary value problem formulations are considered. The theories of thermoelasticity, viscoelasticity and plasticity are introduced. The course also provides an introduction to modeling of inhomogeneous composite solids, the effective moduli theory, and the elasticity of composite laminates. The fundamentals of fracture mechanics and applications to mechanical design are considered.

PREREQUISITES: ENGI 2200.03, MECH 4300.03

### **MECH 6521 Applied Dynamics**

CREDIT HOURS: 3

This course begins with a review of planar kinematics and kinetics of rigid bodies. These concepts are extended to kinematics and kinetics of rigid bodies undergoing general three-dimensional motion. Euler's Equations are applied to a wide range of engineering problems including vehicular and gyroscopic dynamics. Energy methods for bodies undergoing three-dimensional motion are applied to multi-degree-of-freedom systems. Single-degree-of-freedom systems subjected to random and shock inputs are analyzed.

EXCLUSIONS: MECH 4521.03

FORMATS: Lecture | Lab | Tutorial

### **MECH 6530 Mechanics of Composites and Smart Structures**

CREDIT HOURS: 3

The course introduces classification of composite materials, basic relations of anisotropic elasticity, and macro- and micro-mechanical scales of analysis. The



elastic behaviour of fiber reinforced composites; effective moduli theory; elasticity and strength of composite laminates are considered. Asymptotic homogenization method and its applications to mechanical modeling of composites are introduced. Smart (adaptive) structures and their constituents are discussed, and the mechanical behaviour of smart structures is considered.

FORMATS: Lecture | Lab

### **MECH 6535 Fibre Reinforced Plastics**

CREDIT HOURS: 3

This course begins with introduction to various constituents forming fiber-reinforced plastics (FRP). This is followed by the development of the micro-mechanical and macro-mechanical analysis techniques used for designing laminate composites, followed by the study of the strength criteria used in design procedures. Test and production methods will be reviewed. Methods of design and analysis of mechanical and adhesively bonded joints will follow, as well as fracture mechanics of FRP.

PREREQUISITES: Senior level mechanics of materials course

EXCLUSIONS: CIVL 6153.03

FORMATS: Lecture

### **MECH 6540 Continuum Mechanics**

CREDIT HOURS: 3

This course introduces the students to the fundamental principles of continuum and applied mechanics. The course will cover tensor algebra/calculus, strain and deformation measures (both Lagrangian and Eulerian approaches), stress, conservation laws in solid and fluid mechanics and constitutive laws in elastic materials, Newtonian fluids and viscoelastic solids.

PREREQUISITES: Stress Analysis (e.g. MECH 4300, CIVL 3700, MATL 3621), Fluid Mechanics (e.g., ENGI 2300), basic ordinary differential equations (e.g., ENGM 2021), basic linear algebra (e.g., ENGM 3361).

FORMATS: Lecture | Tutorial | Seminar

### **MECH 6560 Space Systems**

CREDIT HOURS: 3

This course deals with the engineering design and analysis of space systems and their interrelationships. Topics include orbital mechanics, satellite perturbations, satellite actuator and sensor systems, communication facilities and networks, satellite access and coverage.

EXCLUSIONS: MECH 4560.03

FORMATS: Lecture | Tutorial

### **MECH 6620 Identification of Systems**

CREDIT HOURS: 3

The objective of this course is to introduce methods of dynamic system identification. System identification leads to development of optimal mathematical models of physical systems from experimentally collected digital data. Topics include: experiment design for identifiability, digital signal filtering, mathematical optimization, system parameter estimation, modal analysis of vibratory systems.

### **MECH 6640 Robot Mechanics**

CREDIT HOURS: 3

This course provides a brief introduction to the field of Robotics, a brief review of selected topics from linear algebra, and an introduction to theoretical kinematics. The main part of the course includes such topics as: robot geometry, velocity Jacobians, derivation of equations of motion; force, manipulability, inertia and compliance analysis; position and force control, optimization of kinematic redundancy, multirobot coordination; robot calibration; performance testing and characterization. The course also provides an introduction to space robots, smart structures, and walking machines as well.

PREREQUISITES: MECH 4640.03 or equivalent

### **MECH 6660 Finite-element simulation techniques**

CREDIT HOURS: 3

This course deals with the applications of the finite-element method to analyze practical problems in mechanical design and delves into the fundamental numerical aspects. Robust modelling concepts such as plane stress, plane strain and axisymmetric techniques and the use of beam, plates, and shell elements in modelling of more complex system will be discussed. Static, dynamic, and elastic-plastic analyses will be considered. Students will be asked to perform in-depth analysis of a practical mechanical system.

PREREQUISITES: Instructor Permission

EXCLUSIONS: MECH 4670.03

FORMATS: Lecture | Lab | Tutorial

### **MECH 6710 Computational Hydrodynamics I**

CREDIT HOURS: 3

This course deals with the computational methods for 2-D and 3-D potential flow in the infinite domain. The theories of boundary integral equation (BIE), Cauchy's formula and conformal mapping are introduced. The discretization techniques for numerical solution of hydrodynamics problems are emphasized. The alternative formulation of BIE for the thin body is discussed. The body-geometry approximation with Non-Uniform Rational B-Spline (NURBS) is also covered.

PREREQUISITES: MECH 3300.03, approval of the instructor

### **MECH 6905 Autonomous Robotics**

CREDIT HOURS: 3

Introduction to autonomous robotics with a focus on the marine environment. Discussions to probabilistic robotics, application to modern machine learning techniques, knowledge-based systems to robotic decision-making, an overview of the robotics environment, Bayesian filtering, simultaneous localization and mapping, and optimal control. Students will implement the theories on actual robots for the course project.

PREREQUISITES: Undergraduate probability and statistics, some programming, and calculus

CROSSLISTED: CSCI 6511.03

FORMATS: Lecture | Lab

### **MECH 6910 Graduate Seminar I**

CREDIT HOURS: 3

MENG and MASC. students in mechanical engineering will prepare and present seminars on research topics related to their thesis project. Master's students shall present a minimum of one seminar. Graduate students are required to attend all graduate seminars. Students will be evaluated on their preparation, presentation skills, ability to field questions and regular attendance. Graded pass/fail.

### **MECH 6950 Advanced Control Engineering**

CREDIT HOURS: 3

The course continues to develop the students' capabilities in system simulation and feedforward/feedback control-system design and implementation. Topics include: system-parameter identification, control-system hardware, computer-based control systems, design techniques for multiple-input multiple-output systems, and adaptive control. The course is supported by computer-based simulation activities and design procedures, and by hands-on laboratory experience.

CROSSLISTED: MECH 4950.03

FORMATS: Lecture | Lab | Tutorial

### **MECH 6951 Applied Nonlinear Control**

CREDIT HOURS: 3

Advanced nonlinear control approaches are introduced to the students. Applications to highly nonlinear electro-mechanical systems are discussed. Topics include: characteristics of nonlinear systems, feedback linearization, gain scheduling, adaptive control, robust and optimal nonlinear control, sliding mode control, passivity based control, backstepping, describing function, anti-windup saturations and singular perturbations etc.

FORMATS: Lecture | Tutorial

### **MECH 6960 Computational Methods in Engineering**

CREDIT HOURS: 3

The course presents basic computer methods of application of mathematical tools to solve engineering problems. Numerical methods such as finite differences, series expansions, and numerical integration are introduced. Numerical solutions of ordinary and partial differential equations with applications to equilibrium, eigenvalue and propagation problems in engineering are considered. Application of mathematical libraries, X-window system and the software tools associated with the Unix system are included.

EXCLUSIONS: MECH 4960.03

FORMATS: Lecture | Lab | Tutorial

### **MECH 6990 Directed Studies in Mechanical Engineering I**

CREDIT HOURS: 3

This course is available to graduate students enrolled in a Master's Degree Program in Mechanical Engineering, who wish to gain knowledge in a specific area for which no graduate-level courses are offered. Students are assigned an advisor and are required to present a formal report, or take a formal examination, at the end of the course. Registration approval is required from the Head of the Department of Mechanical Engineering.

### **MECH 7910 Graduate Seminar II**

CREDIT HOURS: 3

PhD students in mechanical engineering will prepare and present seminars on research topics related to their thesis project. PhD students shall present a minimum of two seminars (one of which may be the thesis proposal). Graduate students are required to attend all graduate seminars. Students will be evaluated on their preparation, presentation skills, ability to field questions, and regular attendance. Graded pass/fail.

### **MECH 7990 Directed Studies in Mechanical Engineering II**

CREDIT HOURS: 3

This course is available to graduate students enrolled in PhD Program in Mechanical Engineering who wish to gain knowledge in a specific area for which no graduate-level courses are offered. Students are assigned an advisor and are required to present a formal report, or take a formal examination, at the end of the course. Registration approval is required from the Head of the Department of Mechanical Engineering.

### **MECH 8500 MEng Project**

CREDIT HOURS: 0

A Master of Engineering candidate will be required to submit a project satisfactory to the Faculties of Graduate Studies and Engineering and to make a successful oral presentation of the work.

### **MECH 8891 Co-op Work-Term I**

CREDIT HOURS: 0

### **MECH 8892 Co-op Work-Term II**

CREDIT HOURS: 0

### **MECH 8893 Co-op Work-Term III**

CREDIT HOURS: 0

### **MECH 8894 Co-op Work-Term IV**

CREDIT HOURS: 0

### **MECH 8900 MEng Project**

CREDIT HOURS: 6

A Master of Engineering candidate will be required to submit a project satisfactory to the Faculties of Graduate Studies and Engineering and to make a successful oral presentation of the work.

EXCLUSIONS: MECH 8500.00

### **MECH 9000 Master's Thesis/Project**

CREDIT HOURS: 0

## MECH 9530 PhD Thesis

CREDIT HOURS: 0

# Medical Neuroscience

Location:

Sir Charles Tupper Medical Building

5850 College Street

Room 13-B1

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2051

Fax Number: (902) 494-1212

Email Address: [pauline.fraser@dal.ca](mailto:pauline.fraser@dal.ca)

Website: [medicine.dal.ca/medical-neuroscience](http://medicine.dal.ca/medical-neuroscience)

## Introduction

The Department of Medical Neuroscience offers graduate training leading to MSc and PhD degrees in Medical Neuroscience. Students are trained in the field of modern-cellular and molecular neuroscience as a foundation to stimulate curiosity-driven neuroscience research and to develop effective strategies to detect, treat and cure diseases of the nervous system.

## Staff

### D. G. J. Campbell Professor and Head of Department

**Baldrige, W. H.**, BSc (Toronto), PhD (McMaster). Structure and function of the vertebrate retina

### Professors

**Baldrige, W. H.**, BSc (Toronto), PhD (McMaster). Structure and function of the vertebrate retina

**Chauhan, B. C.**, BSc (Glasgow), PhD (Wales, Cardiff), MBCO, primary appointment in Ophthalmology and Visual Sciences.

Experimental glaucoma

**Darvesh, S.**, MD (Dalhousie), PhD (UNB), FRCP (C), primary appointment in Medicine (Neurology). Synthetic chemistry of neurodegenerative disorders

**Friedman, A.**, BSc, MD, PhD (Beer-Sheva). Role of vascular pathology in dysfunction of neuronal networks

**Iulianella, A.**, BSc (McGill), PhD (Montreal). Neurogenesis and patterning of vertebrate nervous system

**Kablar, B.**, MD, PhD (Zagreb, Pisa). Developmental relationship between skeletal myogenesis, neurogenesis, and osteogenesis

**Rafuse, V. F.**, BSc (Acadia), PhD (Alberta). Neuronal development and regeneration

**Schmidt, M.**, MSc, MD (Toronto), FRCP(C), primary appointment in Diagnostic Radiology. Pediatric radiology

**Semba, K.**, BEd, MA (Tokyo), PhD (Rutgers), Graduate Coordinator. Brain mechanisms of sleep and wakefulness

**Uher, R.**, MD, PhD (Charles), CCT (King's College London), primary appointment in Psychiatry. Early interventions during psychiatric diseases

### Associate Professors

**Akay, T.**, BEng (Egirdir-Turday), Diploma (Bielefeld-Germany), PhD (Cologne-Germany). Neuronal Control of locomotion

**Calkin, C.**, BSc, MD (Dalhousie), CCFP, FRCPC(C), primary appointment in Psychiatry. Metabolic and neuroendocrine disorders in

patients with bipolar disorder

**Smith, F. M.**, BSc, MSc, PhD (UBC). Autonomic control of the circulation

**Zhang, Y.**, BSc (Beijing), PhD (Cornell). Development and function of locomotor neural networks

#### **Assistant Professors**

**Pulakunta, T.**, MBBS, MD (Manipal). Medical education and human anatomy

**Weeks, A.**, BSc, MD (UBC), FRSC, PhD (Toronto), primary appointment in Neurosurgery. Brain tumors, invasion, and RNA stress granules

#### **Senior Instructor**

**Jaffar, A.**, MBChB (Baghdad), PhD (Nahrain). Human anatomy

#### **Adjunct (FGS)**

**Franz-Odendaal, T.**, BSc, MSc, PhD (Univ of Cape Town, South Africa). The patterning and induction of neural crest derived bones of the skull. Associate Professor, MSVU

## **Admission Requirements**

Candidates must satisfy the [general requirements for admission](#) to the Faculty of Graduate Studies.

### **Honours Degree Holders**

Applicants with an excellent research background and an A- or better average may apply for direct admission to the PhD program. Others may apply for the MSc program, with the option to transfer to the PhD program after one year, contingent upon the recommendation of the student's Advisory Committee.

### **Master's Degree Holders**

May apply for direct admission to PhD program.

### **Medical Graduates**

Individuals showing an aptitude for research may apply for admission to either the MSc or PhD program.

## **Master of Science (MSc) Medical Neuroscience**

Candidates must satisfactorily complete 13 credit hours of course work, including the required courses MNSC 5200.01: Medical Neuroscience MSc Graduate Seminar (registration required during each term of study) and MNSC 6101.03: Principles of Neuroscience: Cellular & Molecular Neuroscience. An additional 9 credit hours of elective courses are required, selected from those listed below or, where appropriate, from those offered by other departments. Thesis research (MNSC 9000.00: MSc Thesis), preparation and oral defense of a thesis are required.

## **Doctor of Philosophy (PhD) Medical Neuroscience**

Candidates must satisfactorily complete the following required courses: MNSC 5230.01: Medical Neuroscience PhD Graduate Seminar (registration required during each term of study) and, if they have not had previous neuroscience training, MNSC 6101.03: Principles of Neuroscience: Cellular & Molecular Neuroscience. For students transferring from the MSc program to the PhD program, or for students admitted directly to PhD program, a comprehensive examination (PHDP 8000.00: Doctoral Comprehensive Requirement) should be taken in the second year of the program or no later than one full year prior to thesis submission. Thesis research (MNSC 9530.00: PhD Thesis), preparation and oral defense of a thesis are required.

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **ANAT 5000 Clinical Anatomy for Occupational Therapists**

CREDIT HOURS: 3

This course examines the gross anatomical structure of the human body in detail, with emphasis on the musculoskeletal and nervous system including an overview of the cardio-respiratory system. The functional relationship between the anatomical structures and the physiological, biomechanical and kinesiological applications will be highlighted to appreciate how the body works. Modules related to anatomical regions of the human body will be used to facilitate learning and will include readings, lectures, labs and interactive group learning activities.

PREREQUISITES: Admission to the MSc (OT) program, or SSGS (Special Student Graduate Studies) status by permission of the instructor.

FORMATS: Lecture | Lab

### **ANAT 5135 Topics in Mammalian Embryology and Molecular Developmental Biology**

CREDIT HOURS: 6

The course covers various topics in Human Embryology, Histology and Developmental Biology. Students will learn why genetically engineered mice are generated. They will become familiar with different phenotypic analyses of mice, mouse embryos and fetuses that are used as models of human diseases.

CALENDAR NOTES: Credit can only be given for this class if completed over consecutive terms. Partial credit cannot be given for a single term.

CROSSLISTED: PATH 5135.06

EXCLUSIONS: ANAT 5130.06

### **ANAT 5217 Functional Human Anatomy**

CREDIT HOURS: 6

Functional Human Anatomy is a full-credit course covering gross anatomy and peripheral neuroanatomy of the human body through the use of lectures and laboratories. The primary objectives are to learn detailed functional anatomy and peripheral neuroanatomy of the upper and lower limb and the back using anatomical specimens. The course includes a survey of the major structures of the trunk, head and neck, also from a functional point of view. The focus is on the osteology, arthrology, myology, peripheral neurology, and surface anatomy. Students are encouraged to become self-directed learners in anatomy so that they can continue to expand their understanding of the human body throughout their professional careers. Hands-on learning and discussions are required. The course is designed for graduate students in the MSc PT program.

PREREQUISITES: ANAT 1010 or equivalent.

FORMATS:

### **ANAT 9000 MSc Thesis**

CREDIT HOURS: 0

### **ANAT 9530 PhD Thesis**

CREDIT HOURS: 0

### **MNSC 5063 Neurobiology of the Autonomic Nervous System**

CREDIT HOURS: 3

Overview of classical concepts of peripheral autonomic functions, and their re-evaluation in light of recent research. Discussion of the roles of autonomic neurons in control of specific end-organs will be emphasized. Please note that permission of the instructor is required to register for this course, and that a minimum of five students must be enrolled for the course to be given.

CROSSLISTED: ANAT 5063.03

### **MNSC 5070 Chemical Neurobiology**

CREDIT HOURS: 3

The goal of this course is to acquaint the student with neurotransmitters and neuromodulators, including excitatory amino acids, acetylcholine, monoamines, neuropeptides. Anatomical, biochemical, physiological, pharmacological, behavioral, and clinical aspects of individual neurotransmitter systems will be discussed. Students are expected to write an examination and a review and give a presentation. Lectures are given by the instructor and invited lectures.

CROSSLISTED: NESC 5070.03, PHYL 5494.03, ANAT 5070.03

EXCLUSIONS: NESC 4070.03

### **MNSC 5100 Human Neuroanatomy**

CREDIT HOURS: 3

Lectures and labs designed to acquaint the student with the anatomy and organization of the human central nervous system. Lecture topics include: cellular morphology; gross and microscopic anatomy of the spinal cord, brain stem, diencephalon (thalamus and hypothalamus), and telencephalon (cerebral hemispheres); blood supply of the CNS, meninges, and cerebrospinal fluid. Laboratory exercises involve exposure to aspects of microscopic and ultrastructural morphology of the CNS, examination of selected cross sections of spinal cord, brain stem, and diencephalon and telencephalon, and dissection of the brain.

CALENDAR NOTES: Not open to students that took NESC 3440.03 at Dalhousie University, or similar high-level neuroanatomy course at another institution.

EXCLUSIONS: ANAT 5100.06

FORMATS:

### **MNSC 5170 Special Topics**

CREDIT HOURS: 3

This is a flexible course permitting a student to work closely with one or several faculty members; the content of the course is determined by the individual student in consultation with the faculty member involved and is intended to enable students to take advantage of specialized educational opportunities that fall outside the normal course offerings of the Department. A description and justification of course content must be approved by the student's supervisory committee and the Department graduate studies committee. The approved syllabus must be submitted to the Faculty of Graduate Studies by completing the Independent Study/Directed Reading/Special Topics Form available at : <https://www.dal.ca/faculty/gradstudies/currentstudents/forms.html>

FORMATS:

### **MNSC 5171 Special Topics**

CREDIT HOURS: 3

This is a flexible course permitting a student to work closely with one or several faculty members; the content of the course is determined by the individual student in consultation with the faculty member involved and is intended to enable students to take advantage of specialized educational opportunities that fall outside the normal course offerings of the Department. A description and justification of course content must be approved by the student's supervisory committee and the Department graduate studies committee. The approved syllabus must be submitted to the Faculty of Graduate Studies by completing the Independent Study/Directed Reading/Special Topics Form available at : <https://www.dal.ca/faculty/gradstudies/currentstudents/forms.html>

### **MNSC 5200 Medical Neuroscience MSc Graduate Seminar**

CREDIT HOURS: 1

This is a mandatory course for all students in the Medical Neuroscience MSc program, successful completion of which solely requires participation. Students must register for the course during each term whilst they are in the degree program and will receive a grade of IP (in progress) each term until all course requirements are completed. Participation in all course components is required each year throughout the duration of the degree program. The main objectives of the course are to provide opportunities to present, assimilate and evaluate medical neuroscience-related biomedical research. Components include: 1) Participation in a Responsible Conduct of Research training session provided by the Professional & Research Education Program (PREP). 2) Mandatory attendance at Medical Neuroscience departmental seminars and delivery of a seminar. 3) Presentation of research results at local, national, or international conferences. 4) Teaching experience through assisting with the laboratory components of courses delivered by the department. The grading for the course will be Pass/Fail.

### **MNSC 5230 Medical Neuroscience PhD Graduate Seminar**

CREDIT HOURS: 1

This is a mandatory course for all students in the Medical Neuroscience PhD program, successful completion of which solely requires participation. Students must register for the course during each term whilst they are in the degree program and will receive a grade of IP (in progress) each term until all course requirements are completed. Participation in all course components is required each year throughout the duration of the degree program. The main

objectives of the course are to provide opportunities to present, assimilate and evaluate medical neuroscience-related biomedical research. Components include: 1) Participation in a Responsible Conduct of Research training session provided by the Professional & Research Education Program (PREP). 2) Mandatory attendance at Medical Neuroscience departmental seminars and delivery of seminars. 3) Presentation of research results at local, national, or international conferences. 4) Teaching experience through assisting with the laboratory components of courses delivered by the department. The grading for the course will be Pass/Fail.

### **MNSC 6101 Principles of Neuroscience: Cellular and Molecular Neuroscience**

CREDIT HOURS: 3

The course will cover topics such as membrane potentials, synaptic transmission, second messengers, trophic factors, cell differentiation and neurodegeneration. Evaluation will be based on quizzes, several oral presentations prepared throughout the year, and grant proposals.

CROSSLISTED: NESC 6101.03

### **MNSC 6103 Principles of Medical Neuroscience**

CREDIT HOURS: 3

The aims of the course are to introduce the student to medical neuroscience aspects of nervous system operation and to provide the student experience evaluating current literature in a variety of fields and technical areas pertaining to medical neuroscience.

EXCLUSIONS: ANAT 5100.06

### **MNSC 9000 MSc Thesis**

CREDIT HOURS: 0

### **MNSC 9530 PhD Thesis**

CREDIT HOURS: 0

## **Medical Research**

Location:

Clinical Research Centre

5849 University Avenue

Room C-222

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3886

Fax Number: (902) 494-7119

Email Address: [mrdo@dal.ca](mailto:mrdo@dal.ca)

Website: [medicine.dal.ca/research-dal-med/programs/mrgrp.html](http://medicine.dal.ca/research-dal-med/programs/mrgrp.html)

## **Staff**

### **Graduate Coordinator**

Berman, J.

### **Graduate Secretary**

Kinney, J. [mrdo@dal.ca](mailto:mrdo@dal.ca)



# Master of Science (MSc)/Doctor of Philosophy (PhD)

Major advances in biomedical research are now being made in an environment where basic scientists and research-trained clinicians are interacting. There is a critical need to increase the number of such trained physicians locally, regionally, and nationally. This program is designed for persons who will become clinicians, but who plan careers as clinician scientists. The program allows the MD, DDS or DVM (or equivalent) graduate to concentrate primarily on thesis research in Medical Research and bridge the gap between clinical practice and medical research. In addition, the program offers training in clinical research, which is not otherwise formally offered at this University.

Students considering this program must pay particular attention to the following requirements:

1. All students must have an MD, DDS or DVM (or equivalent) degree from an LCME accredited Medical School and all candidates must meet the [admission requirements of the Faculty of Graduate Studies](#).
2. In most cases, candidates will already have an honours bachelor's degree in a basic science discipline, or a bachelor's degree in an appropriate discipline with some evidence of competence in a laboratory or research environment. However, it is recognized that there will be some excellent students whose preparation for their MD, DDS or DVM may not have followed this route. These candidates will be assessed by the Medical Research Program Committee on an individual basis based upon their past performance and suitability for graduate research in the medical sciences. Students who are judged acceptable but who have gaps in their knowledge base or relevant laboratory skills may be required to take additional coursework and should recognize that this may extend the time required to complete the program.
3. The Medical Research Graduate Program (MRGP) may also accept graduates from foreign medical schools who are not registered as residents. Such foreign graduates must provide evidence of proficiency in English by satisfactory TOEFL or IELTS score to the level required by the program. Graduates of foreign medical schools may have to undertake supplementary courses at the undergraduate level before acceptance in the graduate program. The foreign medical school in question must be an approved school (eligible for MCC examination).
4. Additional program specific admission requirements include three credit hours in the discipline most relevant to the research project, as well as, a graduate-level research methodologies course.
5. A letter from the Clinical Department Head or external funding agency confirming secure funding for the training period must accompany all applications.
6. The minimum stipend for non-residents to enter the MRGP will be equivalent to the amount awarded by CIHR as a Masters level scholarship

## Supervision

The program is a research-intensive program. Normally, residents applying to the Medical Research Graduate Program (MRGP) will have made mutually acceptable arrangements with a faculty member(s) for the supervision of their research prior to applying for their program at Dalhousie. Within three months of initiation of the program, a supervisory committee of qualified faculty (must be approved by the Medical Research Program Committee), including the supervisor(s), will be appointed. These faculty will aid in the planning of the thesis research and be available to the student throughout the program for advice. There will be at least two meetings of the Supervisory Committee each year with the student to discuss research progress and future directions. The standards of the program are very high, and the thesis research needs to be of international quality. Publication of the thesis research in peer-reviewed journals is expected.

It should be noted that this program is separate from the [Royal College Clinician Investigator Program \(CIP\)](#), but that the Director of the CIP sits on the Graduate Committee of the Medical Research Graduate Program for effective communication between the two programs. Trainees in the MRGP may also register for the CIP concurrently (if they are enrolled in a Dalhousie residency program), but there is no requirement to do so.

## Program Requirements

At the first meeting of the Supervisory Committee, relevant coursework for the student will be identified by the committee in agreement with the student and the supervisor. There is a minimum requirement of three credit hours in the discipline most relevant to the research project and a graduate level research methodologies course; however, the Committee may require that

additional courses be taken to provide the knowledge base required for the thesis research. In addition, regular contributions to, and attendance at, a Journal Club and a Seminar series are a requirement to ensure a firm grounding in experimental methods.

Two-degree programs are offered; but all students will initially enroll in the MSc program\*, which would normally be for two years\*\*. If, after one year of study, the student wishes to transfer to the PhD Program, and if his/her committee recommends such a transfer, a recommendation will be sent to the Medical Research Program Committee, and from it to the Faculty of Graduate Studies for consideration and approval. The PhD program would be expected to be completed within three years; a maximum of five years would be allowed. In addition, within 18 months of initiation of the Program, the student must complete a comprehensive examination, which will have an oral and a written component.

\* Exceptions will be made for those Residents who already have a MSc degree in a relevant discipline. Decisions on which MSc degrees are acceptable for admission to the Medical Research PhD program are left up to the discretion of the Graduate Program Committee for Medical Research.

\*\* flexibility for individuals with parental responsibilities will be considered.

For more information contact the Graduate Secretary

Telephone: (902) 494-3886

Fax: (902) 494-7119

Email: [mrdo@dal.ca](mailto:mrdo@dal.ca)

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **MEDR 9000 Master's Thesis**

CREDIT HOURS: 0

EXCLUSIONS: MEDS 9000.00

### **MEDR 9530 Doctoral Thesis**

CREDIT HOURS: 0

EXCLUSIONS: MEDS 9530.00

## Microbiology and Immunology

Location:

Sir Charles Tupper Medical Building

5850 College Street

7th Floor

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3587

Fax Number: (902) 494 5125

## Disciplines Within Microbiology and Immunology

Graduate degrees can be pursued in the areas of Virology, Bacteriology, Microbial Pathogenesis, Microbiome, Cancer Biology, and Cellular and Molecular Immunology. Graduate students are expected to acquire a conceptual understanding of the disciplines in microbiology and immunology and an in-depth knowledge of their particular area of specialization. Notwithstanding this, the existence of specified streams in Cellular and Molecular Immunology, Virology, Bacteriology, and Microbial Pathogenesis in the Department may allow well-qualified students, with at least minimal training in Microbiology and Immunology, but a strong background in the appropriate subject area, to concentrate their studies.

## Staff

### Acting Head of Department

**Johnston, B.**, PhD (Calgary), Inflammation and Immune Response: Graduate Coordinator

### Professors

**Duncan, R.**, PhD (Guelph), Molecular Virology

**Halperin, S.**, MD (Cornell) Pediatrics

**Hatchette, T.**, MD (Memorial), Pathology

**Issekutz, T. B.**, MD (Dalhousie), Pediatrics; Inflammation and Leukocyte Traffic

**Kelvin, D. J.**, PhD (Toronto), Immunology

**Kulkarni, K.**, MBBS/MD (India), Pediatrics

**Johnston, B.**, PhD (Calgary), Inflammation and Immune Response: Graduate Coordinator

**Lee, S. F.**, PhD (Guelph), Oral Microbiology

**Lehmann, C.**, MD (Berlin), Anaesthesiology

**Liwski, R.**, PhD, MD (Dalhousie), Pathology

**Makrigiannis, A. P.**, PhD (Dalhousie), Natural Killer Cells in Infection and Cancer

**Marshall, J. S.**, PhD (Manchester), The Role and Regulation of Mast Cells in Immune Responses to Bacteria, Viruses and Tumors.

Regulation of Cytokines in Inflammatory Bowel Diseases and Asthma

**McCormick, C.**, PhD (UBC), Viral Oncology

**Rainey, J.**, (Toronto), Biochemistry and Molecular Biology

**Richardson, C. D.**, PhD (UBC), Molecular Virology

**Stadnyk, A. W.**, PhD (McMaster), Intestinal Inflammation; Cytokines

**Wang, J.**, PhD (McMaster), Host Defence Mechanisms Against Infection and Cancer and Vaccine Development

### Associate Professors

**Davidson, R. J.**, PhD (Manitoba), Antimicrobial Mechanisms of Action and Resistance

**Derfalvi, B.**, PhD (Simmelweis) Pediatrics

**Kim, J.S.**, PhD (Iowa), Community Health and Epidemiology

**Langille, M.**, PhD (Simon Fraser), Pharmacology

**LeBlanc, J.**, PhD, FCCM, (ABMM) (Dalhousie), Clinical and Molecular Microbiology

**Legare, J. F.**, MD (McGill), Transplantation and Mechanism of Heart Failure

**Marcato, P.**, PhD (Alberta), Pathology

**Rohde, J.**, PhD (UBC), Bacterial Pathogenesis and Ubiquitin

**Thomas, N.**, PhD (Queen's), Molecular Bacterial Pathogenesis

### Assistant Professors

**Barrett, L.**, MD, PhD (Memorial), Medicine

**Boudreau, J.**, PhD (McMaster), Human NK Immunology, Immunogenetics and Disease Processes

**Cheng, Z.**, PhD (Waterloo), Host Bacterial Interactions, Cancer Biology: Associate Graduate Studies Coordinator

**DiCara, F.**, PhD (Naples), Peroxisomes, Genetics, Drosophelia

**Gujar, S.**, PhD (Memorial), Cancer Immunotherapy, Oncolytic Viruses, Cell Biology, Applied Immuno-metabolomics

**Kelvin, A.**, PhD (Queen's, Belfast), Pediatrics

**Khaperskyy, D.**, PhD (State University of NY, Buffalo), Host-pathogen Interaction, Influenza A Virus, Cellular Stress Responses

### **Adjunct (FGS)**

**Bezuhly, M.**, MD (Toronto), Surgery

**Corcoran, J.**, PhD (Dalhousie)

**Holbein, B.**, PhD (Guelph)

**Lin, L.-T.**, PhD (Dalhousie), Taiwan

**Pinto, D.**, PhD (Alberta)

**Stanford, M.**, PhD (Dalhousie)

### **Senior Instructor**

**Murray, L. E.**, PhD (Dalhousie), Molecular Genetics

## **Admission Requirements**

In conjunction with the general requirements for admission, candidates must have received sound basic instruction in Biochemistry and Cell Biology and 24 credit hours in a relevant discipline or disciplines (eg. Virology, Bacteriology, Microbial Pathogenesis, Microbial Genetics, Molecular Genetics, Cancer Biology, Cellular and Molecular Immunology) with a B+ average or better.

## **Master of Science (MSc)**

\*All graduate students are required to take MICI 5400.03: Host Pathogen Interactions and Human Disease in their first year.

Students and supervisors may request a one-year deferral under special circumstances, for example, students required to upgrade their academic background.

For the minimum time required to complete this program, see the [Faculty of Graduate Studies Regulation](#) 1.3.1 in this calendar. Students typically finish in 2 years. Participation in seminars and advanced topic courses (journal clubs) is required. The course requirements for each MSc candidate normally consist of 9 - 12 credit hours. Specific courses outside the required courses are determined by the supervisory committee normally in consultation with the student. The program must be approved by the departmental Graduate Studies Committee. A research project must be completed, the result of which will be embodied in a thesis. An oral defence of the thesis is required.

## **Doctor of Philosophy (PhD)**

\*All graduate students are required to take MICI 5400.03: Host Pathogen Interactions and Human Disease in their first year.

Students and supervisors may request a one-year deferral under special circumstances, for example, students required to upgrade their academic background.

For the minimum time required to complete this program, see the [Faculty of Graduate Studies Regulations](#). Students typically finish in 5-6 years. Participation in seminars and advanced topic courses (journal clubs) is required. The course requirements for each PhD candidate normally consist of 9 - 12 credit hours. Specific courses outside the required courses are determined by the supervisory committee, normally in consultation with the student. The program must be approved by the departmental Graduate Studies Committee. Comprehensive knowledge of the area of specialization must be demonstrated and will be assessed by written and oral examination.

Research of a high caliber is required, the results of which must be embodied in a thesis which makes a significant contribution to knowledge in the chosen field. An oral defence of the thesis before the committee and an external examiner is required.

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **MICI 5003 Special Topics in Microbiology and Immunology**

CREDIT HOURS: 3

This course allows students to investigate, under the supervision of a faculty member, an area of microbiology or immunology that is not covered in formal classes. The topics in which the Department can offer instruction are dependent on the research interests and expertise of department members. Student must consult with the Graduate Studies Coordinator prior to enrolling in this course.

FORMATS: Seminar | Discussion

### **MICI 5016 Topics in Advanced Immunology -MSc**

CREDIT HOURS: 3

A seminar-based class where each student presents a paper from the recent immunology literature with a one-page written summary and critique. Active discussion of the subject is encouraged from all participants to determine the merits, strengths and weaknesses, and the scientific relevance of the paper presented.

CALENDAR NOTES: Graduate students are required to take this course throughout their entire program. MSc students must register in the Fall Term for MICI 5016.03 and in the Winter Term for MICI 5056.03; PhD students must register in the Fall Term for MICI 5036.03 and in the Winter Term for MICI 5046.03.

FORMATS: Seminar | Discussion

### **MICI 5019 Advanced Topics in Molecular Pathogenesis - MSc**

CREDIT HOURS: 3

A seminar-based course where each student presents a paper from the recent bacterial pathogenesis literature with a one-page written summary and critique. Active discussion of the subject is encouraged from all participants to determine the merits, strengths and weaknesses, and the scientific relevance of the paper presented.

CALENDAR NOTES: Graduate students are required to take this course throughout their entire program. MSc students must register in the Fall Term for MICI 5019.03 and in the Winter Term for MICI 5029.03; PhD students must register in the Fall Term for MICI 5039.03 and in the Winter Term for MICI 5049.03.

FORMATS: Seminar | Discussion

### **MICI 5029 Advanced Topics in Molecular Pathogenesis - MSc**

CREDIT HOURS: 3

A seminar-based class where each student presents a paper from the recent bacterial pathogenesis literature with a one-page written summary and critique. Active discussion of the subject is encouraged from all participants to determine the merits, strengths and weaknesses, and the scientific relevance of the paper presented.

CALENDAR NOTES: Graduate students are required to take this course throughout their entire program. MSc students must register in the Fall term for MICI 5019.03 and in the Winter term for MICI 5029.03; PhD students must register in the Fall term for MICI 5039.03 and in the Winter term for MICI 5049.03

FORMATS: Seminar | Discussion

### **MICI 5033 Advanced Microbial Genetics**

CREDIT HOURS: 3

This advanced course focuses on select aspects of bacterial gene regulation including bacterial viruses. Topics include gene transfer, transposon biology, bacterial cell signaling, activators and repressors, molecular and chemical approaches to genetic analysis and regulation of bacterial gene expression.

EXCLUSIONS: MICI 4033.03

FORMATS: Lecture

### **MICI 5036 Topics in Advanced Immunology - PhD**

CREDIT HOURS: 3

A seminar-based class where each student presents a paper from the recent immunology literature with a one-page written summary and critique. Active

discussion of the subject is encouraged from all participants to determine the merits, strengths and weaknesses, and the scientific relevance of the paper presented.

CALENDAR NOTES: Graduate students are required to take this course throughout their entire program. MSc students must register in the Fall term for MICI 5016.03 and in the Winter term for MICI 5056.03; PhD students must register in the Fall term for MICI 5036.03 and in the Winter term for MICI 5046.03

FORMATS: Seminar | Discussion

### **MICI 5039 Advanced Topics in Molecular Pathogenesis - PhD**

CREDIT HOURS: 3

A seminar-based class where each student presents a paper from the recent bacterial pathogenesis literature with a one-page written summary and critique. Active discussion of the subject is encouraged from all participants to determine the merits, strengths and weaknesses, and the scientific relevance of the paper presented.

CALENDAR NOTES: Graduate students are required to take this course throughout their entire program. MSc students must register in the Fall term for MICI 5019.03 and in the Winter term for MICI 5029.03; PhD students must register in the Fall term for MICI 5039.03 and in the Winter term for MICI 5049.03

FORMATS: Seminar | Discussion

### **MICI 5040 Pathobiology of Cancer**

CREDIT HOURS: 3

This course will examine the basic molecular and cellular biology of carcinogenesis and tumour pathobiology, as well as emerging topics in cancer genomics, diagnosis, and treatment. The clinical aspects of cancer management will also be highlighted, including surgery, radiation, and chemotherapy.

CROSSLISTED: BIOC 5503.03, PATH 5040.03

### **MICI 5046 Topics in Advanced Immunology - PhD**

CREDIT HOURS: 3

A seminar-based class where each student presents a paper from the recent immunology literature with a one-page written summary and critique. Active discussion of the subject is encouraged from all participants to determine the merits, strengths and weaknesses, and the scientific relevance of the paper presented.

CALENDAR NOTES: Graduate students are required to take this course throughout their entire program. MSc students must register in the Fall term for MICI 5016.03 and in the Winter term for MICI 5056.03; PhD students must register in the Fall term for MICI 5036.03 and in the Winter term for MICI 5046.03

FORMATS: Seminar | Discussion

### **MICI 5049 Advanced Topics in Molecular Pathogenesis - PhD**

CREDIT HOURS: 3

A seminar-based class where each student presents a paper from the recent bacterial pathogenesis literature with a one-page written summary and critique. Active discussion of the subject is encouraged from all participants to determine the merits, strengths and weaknesses, and the scientific relevance of the paper presented.

CALENDAR NOTES: Graduate students are required to take this course throughout their entire program. MSc students must register in the Fall term for MICI 5019.03 and in the Winter term for MICI 5029.03; PhD students must register in the Fall term for MICI 5039.03 and in the Winter term for MICI 5049.03

FORMATS: Seminar | Discussion

### **MICI 5056 Topics in Advanced Immunology - MSc**

CREDIT HOURS: 3

A seminar-based class where each student presents a paper from the recent immunology literature with a one-page written summary and critique. Active discussion of the subject is encouraged from all participants to determine the merits, strengths and weaknesses, and the scientific relevance of the paper presented.

CALENDAR NOTES: Graduate students are required to take this course throughout their entire program. MSc students must register in the Fall term for MICI 5016.03 and in the Winter term for MICI 5056.03; PhD students must register in the Fall term for MICI 5036.03 and in the Winter term for MICI 5046.03

FORMATS: Seminar | Discussion

### **MICI 5100 Processes and Mediators of Inflammation**

CREDIT HOURS: 3

This advanced course focuses on the cellular and molecular mechanisms of inflammation and consists of lectures and student presentations based on review articles and current research papers. Topics include: inflammatory mediators and receptors, complement, steroids, and tissue remodeling. Current research questions and emerging treatments are emphasized.

PREREQUISITES: Instructor's consent.

CROSSLISTED: PATH 5100.03  
EXCLUSIONS: MICI 4100.03  
FORMATS: Lecture | Discussion

### **MICI 5114 Advanced Topics in Molecular and Medical Virology**

CREDIT HOURS: 3

A course designed to look in detail at selected aspects of molecular and medical virology. The course is based on student presentation of current literature, in combination with introductory lectures and paper discussions.

EXCLUSIONS: MICI 4114.03

FORMATS: Lecture | Discussion

### **MICI 5116 Current Topics in Mucosal Immunology**

CREDIT HOURS: 3

The course consists of lectures and student-led presentations and discussions of current publications (chosen by the course coordinator). Each week will be focused on a single theme but covering topics in the gastrointestinal tract and respiratory and genitourinary systems. Weekly themes will include, mechanisms of tolerance, models of intestinal inflammatory diseases, role of IgA, vaccines use in respiratory diseases, response to urinary tract infection, aspects of reproductive immunology and others. Students will typically present three publications in the course. Evaluations are based on student presentations, written summaries of the discussion following (their own) presentations, participation in the discussions of other student presentations and a research project report on a topic chosen by the student. There are no exams.

PREREQUISITES: permission of instructor

EXCLUSIONS: MICI 4116.03

### **MICI 5400 Host Pathogen Interactions and Human Disease**

CREDIT HOURS: 3

This advanced course explores host-pathogen interactions in human disease, focusing on how pathogens modify, disrupt, or utilize cellular functions in major human infections of global importance. Students will also learn how to critically evaluate the scientific literature, develop hypotheses, and design experiments to test these hypotheses.

CALENDAR NOTES: All graduate students are required to take MICI 5400.03 in their first year. Students and supervisors may request a one-year deferral under special circumstances, for example, students required to upgrade their academic background.

FORMATS: Lecture | Discussion

### **MICI 9000 MSc Thesis**

CREDIT HOURS: 0

### **MICI 9530 PhD Thesis**

CREDIT HOURS: 0

## **Musicology**

Location:

6101 University Avenue  
Room 514  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-1465

Fax Number: (902) 494-2801

## Introduction

The Fountain School of Performing Arts welcomes students interested in the study of musicology at the graduate level, leading to the MA degree. Students in the MA in Musicology program will have the opportunity to investigate music's role and meaning in various social and historical contexts, through text-based analysis informed by cultural studies. Our faculty members pursue research in genres ranging from medieval chant to contemporary experimental composition, canonic orchestral repertoire, film music, and diverse styles understood to be popular music. We foster a vibrant intellectual climate that encourages innovative approaches and non-traditional thinking about music as a social text, and the small size of our program guarantees a great deal of specialized attention and the possibility of tailoring courses of study to suit individual interests. The MA in Musicology is suitable preparation for doctoral studies in musicology and some other humanities disciplines, as well as work in the fields of journalism, music education, editing, and arts administration.

## Staff

### Director of School

**Warwick, J.**, BMus (Toronto), MA (York), PhD (UCLA)

### Associate Director, Graduate Studies and Research

**Bain, J.**, BMus (Wilfrid Laurier), MA (McGill), PhD (SUNY Stony Brook)

### Professor Emeritus

**Schroeder, D. P.**, AMus, BA, MA (Western) PhD (Cantab)

### Professors

**Bain, J.**, BMus (Wilfrid Laurier), MA (McGill), PhD (SUNY Stony Brook)

**Warwick, J.**, BMus (Toronto), MA (York), PhD (UCLA)

### Associate Professors

**Baur, S.**, BA (Music) (Loyola Marymount), MA, PhD (UCLA)

**Joubert, E.**, BMus, MA (Toronto), DPhil (Oxford)

### Cross-listed Members

**Barker, R.**, BA (King's), MA (Dalhousie), PhD (Shakespeare Institute)

**Brownlee, S.**, BA (King's), MA (York), PhD (UC Santa Cruz)

**Nicol, D.**, BA (Wales), MA (Birmingham), PhD (UCE)

### Adjunct (FGS)

**Behrendt, I.**, BA (Folkwang Universität der Künste), PhD (Graz)

**McDonald, C.**, BA (Trent), MA, PhD (UBC)

**Stimeling, T.**, BA (West Virginia Wesleyan), MM (West Virginia), PhD (North Carolina at Chapel Hill)

**Summerby-Murray, R.**, BA, MA (Canterbury), PhD (Toronto)

## Admission Requirements

Admission to the program is granted to applicants with a Bachelor's degree in a relevant field, and who demonstrate an outstanding capacity for research in music. Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

## Master of Arts (MA) Degree Program



The MA is a thesis-based program, in which students take two required seminar courses and choose three other seminars before embarking on a thesis prospectus and then thesis research. This is normally a two-year degree. Students in the program are eligible for Fountain Graduate Fellowships, Dalhousie graduate scholarships, and research and teaching assistantships in the Fountain School of Performing Arts.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **MUSC 5000 Research Methods in Music**

CREDIT HOURS: 3

In this course students will develop skills in current musicological research practices.

PREREQUISITES: Bachelor's degree

FORMATS: Seminar

### **MUSC 5001 Proseminar in Musicology**

CREDIT HOURS: 3

This course is a team-taught introduction to recent methods and techniques of music scholarship. The focus of our inquiry will be the potential advantages of such lines of questioning, and their significance for musicology as a scholarly discipline.

PREREQUISITES: Bachelor's degree

FORMATS: Seminar

### **MUSC 5280 Contemporary Techniques**

CREDIT HOURS: 3

Some of today's main compositional techniques will be studied in this course. These may include advanced modal and 12-tone writing, interval, and texture-oriented procedures, as well as aleatoric strategies.

PREREQUISITES: MUSC 2202, or permission of instructor

CROSSLISTED: MUSC 4280.03

FORMATS: Seminar

### **MUSC 5353 Music Since 1945**

CREDIT HOURS: 3

This seminar explores themes in the history of music after 1945. This period is so recent that there is not a standard narrative for it, and the very premise of a single absolute narrative is called into question. We will focus throughout this course on music's meaning in contemporary society, with critical attention to issues of equity, diversity, and inclusion. Whether we are exploring avant-garde experimentation, the historical performance movement, jazz, rock, or rap, our aim will be to examine how the music engages with its social and political surroundings, and how it shapes and is shaped by historical circumstances and context.

PREREQUISITES: Bachelor's degree in music or permission of the instructor

EXCLUSIONS: MUSC 4351.03

FORMATS: Seminar

### **MUSC 5354 Popular Music Analysis**

CREDIT HOURS: 3

We examine various methods and techniques for studying popular music, the central debates of this relatively new field of scholarly inquiry, and the contributions of popular music scholarship to the larger fields of music study.

PREREQUISITES: Bachelor's degree in music or permission of the instructor

CROSSLISTED: MUSC 4354.03

FORMATS: Seminar

### **MUSC 5355 Narrative Strategies in Nineteenth-Century Music: Gender, Identity, and Social Politics**

CREDIT HOURS: 3

An interdisciplinary survey of nineteenth-century instrumental music, focusing on the narrative potential of nineteenth-century musical conventions and their relationship to other aspects of nineteenth-century Western culture. Representative works will be studied within the context of broader social and cultural issues including gender, race, class, sexuality, nationality, ethnicity, and identity.

PREREQUISITES: Bachelor's degree

CROSSLISTED: MUSC 4355.03, GWST 4355.03

FORMATS: Seminar

### **MUSC 5356 Opera Studies**

CREDIT HOURS: 3

An examination of current critical issues in opera studies. Specific topics may vary from year to year; examples include 'Opera and Politics' and 'Operas of Mozart on Stage and Screen', 'Women in Opera', 'Opera on Film.'

PREREQUISITES: MUSC 2352: Open to non-majors by permission of instructor

CROSSLISTED: MUSC 4356.03

FORMATS: Seminar

### **MUSC 5357 Music and Society in Nineteenth Century America**

CREDIT HOURS: 3

An exploration of music and its relationship to American social issues during the nineteenth century, tracing multiple and varied musical traditions throughout the period and investigating their role in the negotiation of race, class, gender, and other vital social issues.

PREREQUISITES: Bachelor's degree

FORMATS: Seminar

### **MUSC 5362 Topics in Canadian Music**

CREDIT HOURS: 3

This course focuses on one or more of the following topics: Canadian composers, performers, and musical institutions. The perspective may be analytical, aesthetic, and/or historical.

PREREQUISITES: Bachelor's degree in music or permission of instructor

CROSSLISTED: MUSC 4362.03

FORMATS: Seminar

### **MUSC 5364 Topics in Musicology**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to MUSC 5365/MUSC 5366.

PREREQUISITES: Undergraduate degree in music

FORMATS: Seminar

### **MUSC 5365 Topics in Musicology**

CREDIT HOURS: 3

See MUSC 5364.

### **MUSC 5366 Topics in Musicology**

CREDIT HOURS: 3

See MUSC 5364.

**MUSC 5367 Topics in Musicology**

CREDIT HOURS: 3

These are intensive studies of selected topics announced annually.

PREREQUISITES: Undergraduate degree in music

FORMATS: Seminar

**MUSC 5368 Topics in Musicology**

CREDIT HOURS: 3

See MUSC 5367

**MUSC 5369 Topics in Musicology**

CREDIT HOURS: 3

See MUSC 5367

**MUSC 5370 Selected Musician Studies**

CREDIT HOURS: 3

An intensive study of a single musical figure from any genre of music or time period, focusing on creative contributions and cultural context.

PREREQUISITES: Undergraduate degree in music

FORMATS: Seminar

**MUSC 5371 Selected Musician Studies**

CREDIT HOURS: 3

An intensive study of a single musical figure from any genre of music or time period, focusing on creative contributions and cultural context.

**MUSC 5390 Directed Studies 1**

CREDIT HOURS: 3

Individually directed research and writing under the supervision of an appropriate member of the School.

PREREQUISITES: Permission of instructor and the Associate Director, Graduate Studies and Research.

FORMATS: Other (explain in comments)

**MUSC 5391 Directed Studies 2**

CREDIT HOURS: 3

Individually directed research and writing under the supervision of an appropriate member of the School.

PREREQUISITES: Permission of instructor and the Associate Director, Graduate Studies and Research.

FORMATS: Other (explain in comments)

**MUSC 8000 M. A. Thesis Prospectus**

CREDIT HOURS: 0

Although not a formal seminar course, this course number identifies the student's independent work in developing the thesis prospectus and in research towards the thesis.

PREREQUISITES: Permission of graduate coordinator

**MUSC 9000 M. A. Thesis**

CREDIT HOURS: 0

PREREQUISITES: Permission of graduate coordinator

# Nursing

Location:  
Forrest Building  
5869 University Avenue  
1st Floor  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-2535  
Fax Number: (902) 494-3487  
Email Address: [nursing.enquiries@dal.ca](mailto:nursing.enquiries@dal.ca)  
Website: [nursing.dal.ca](http://nursing.dal.ca)

## Staff

### Director & Assistant Dean Research

**Martin Misener, R.,** DOCHN, BScN, MN (Dalhousie), PhD (Calgary), RN, NP. Nurse Practitioners, primary health care, rural/northern health

### Associate Director Research and International Affairs

**Aston, M.,** BNSc, MEd (Queen's), PhD (Toronto), RN. Community health nursing, family nursing, maternal, child and infant care, critical pedagogy, feminist research, poststructuralism, global health

### Associate Director Graduate Studies

**Macdonald, M.,** BN (UNB), MScN (Maine), PhD (San Diego), RN. Patient safety, safety in home care, systematic reviews (JBI)

### Professors

**Aston, M.,** BNSc, MEd (Queen's), PhD (Toronto), RN. Community health nursing, family nursing, maternal, child and infant care, critical pedagogy, feminist research, poststructuralism, global health

**Cambell-Yeo, M.,** BN, MN (Dalhousie), PhD (McGill), RN. Clinical trials examining the impact of family and novel interventions on infant outcomes, pain stress, skin-to-skin contact, co-bedding

**Curran, J.,** BN, MEd (Memorial), PhD (Dalhousie), RN. Knowledge translation research, professional practice change, knowledge synthesis, pediatrics, emergency care, behaviour change theories, intervention design

**Hughes, J. M.,** BN (Dalhousie), MS (Boston), PhD (McGill), RN. Family violence: child abuse/maltreatment, mother-child interaction/parenting, empathy, mental health issues/policy, autonomy/resiliency

**Latimer, M.,** BA (Mt. A), BScN, MN (Dalhousie), PhD (McGill), Post Doc (Laval) RN. Pediatric pain care, nurses' work life and patient outcomes, knowledge translation, organizational research, Aboriginal people research

**Macdonald, M.,** BN (UNB), MScN (Maine), PhD (San Diego), RN. Patient safety, safety in home care, systemic reviews (JBI)

**Martin Misener, R.,** DOCHN, BScN, MN (Dalhousie), PhD (Calgary), RN, NP. Nurse Practitioners, primary health care, rural/northern health

**Steenbeek, A.,** BScN, MScN, PhD (UBC), RN. Infectious diseases, epidemiology, Aboriginal sexual health, community-based research

**Weeks, L.,** BSc (UPEI), MSc (Univ Maine), PhD (Virginia Tech). Aging, care transitions, gender and aging, family caregivers, abuse of older adults, end-of-life care, housing, long-term care, rural issues

### Associate Professors

**Bombay, A.,** BSc (Ottawa), MSc, PhD (Carleton), Post Doc (Ottawa). Relations between well-being, cultural identity, discrimination among Canadian Aboriginal peoples; long-term effects of collective traumas, e.g., Indian Residential Schools

**Goldberg, L.,** BA (CBU), MA (Dalhousie), PhD (Alberta), RN. Perinatal nursing, feminist phenomenology, queer women's health, and nursing philosophy

**Price, S.,** BScN, MN (Dalhousie), PhD (McGill), RN. Nursing health services, professional socialization, community, and women's health, interprofessional collaboration, qualitative methodology

**Tamlyn, D.,** BN (McGill), MEd (Ottawa), PhD (Dalhousie), RN. Leadership policy initiatives, women and aging

**Waldron, I.,** BA (McGill), MA (London), PhD (Toronto). Impact of inequality on the health and mental health of racially diverse communities

## Assistant Professors

**Cassidy, C.**, BScN (UPEI), PhD (Dalhousie), RN, Implementation science, integrated knowledge translation, pediatrics

**Chircop, A.**, BScN, MN, PhD (Dalhousie), RN. Health equity, social justice, environmental health, social and cultural determinants of health, community and family health, critical ethnography, institutional ethnography

**Lackie, K.**, BScN, MN, PhD (Dalhousie), RN. Interprofessional education, interprofessional collaboration, simulation-based education, psychological safety, productivity, evidence-based decision-making

**Moody, E.**, BScN (St. FX), MN (UBC), PhD (Dalhousie), RN. Health and well-being of older people

## Senior Instructors

**Sheffer, C.**, BN, MN, PhD (Dalhousie), RN. Heideggerian phenomenology, perinatal health, women's health, breastfeeding

## Lecturer

**Graham, L.**, BScN (Ryerson), MN (Toronto), MN-NP. Neonatal health

**Hebert, K.**, BN (Memorial), MN (Athabasca), NP. Nurse practitioner primary health care, clinical teaching, and simulation

**Prendergast, S.**, RN (McMaster), BMid (Otago Polytechnic), MN/NP (Alberta)

## Cross Appointments

**Murphy, A.**, BSc (Dalhousie), PharmD (UBC)

**Robinson, M.**, BA (SMU), MA, PhD (Toronto)

## Adjunct (FGS)

**Hatala, A.**, BA, PhD (Manitoba)

**Jones, K.**, BSc Pharm (Dalhousie)

**Kelly, N.**, BScN, MN (Dalhousie), RN-NP

**Leadbetter, H.**, BScN, MN (Dalhousie), RN

**MacDonald, A.**, BScN (St. FX), MN (Dalhousie), RN-NP

**McCord, H.**, BScN, MN (Dalhousie), RN-NP

**McKinnon, D.**, BScN (St. FX), MN (Dalhousie), RN-NP

**McLeod, D.**, BN, MN (Dalhousie), PhD (Calgary), RN

**Meininger-Fieldhouse, E.**, BScN (Laurentian), MN (Alberta), RN-NP

**Miller, L.**, BN (UNB), MN (Athabasca), DNP (George Washington), RN-NP

**Mitchell, C.**, BN (MUN), MN (Athabasca), DNP (Massachusetts-Amherst), RN-NP

**Morrison, D.**, BScN (St. FX), MN (Dalhousie), RN-NP

**O'Neill, N.**, BN, MN (Dalhousie), RN-NP

**Perrin, J.**, BScN, MN (Dalhousie), RN-NP

**Roach, S.**, BComm (Alberta), B Jour (King's College), BScN (Alberta), MN/MHA (Dalhousie), RN

**Sheppard, D-A.**, BScN (Ottawa), MSCHQ (Queen's), RN

**Taylor, C.**, BBA (UCCB), BN (Athabasca), MN (Dalhousie), PhD (Toronto), RN-NP

**Tomblin Murphy, G.**, BN, MN (Dalhousie), PhD (Toronto), RN

## Adjunct (Retired)

**MacMillan K.**, MA, MSc, PhD (Toronto)

**Sabo, B.**, BA, MN, PhD (Dalhousie)

# Admission Requirements/Deadlines

## Master of Nursing (MN)

All applicants must be licensed to practice as a registered nurse (active practitioner) in a province in Canada or in a foreign country. Applicants must have a four-year Bachelor's degree or its equivalent with a minimum "B+" standing. Introductory courses in research and statistics completed within 5 years of admission are required. Applicants to the MN Nurse Practitioner option must hold a license to practice in a Canadian jurisdiction.

The application deadline for the Master of Nursing is February 1.

## Master of Science in Nursing (MScN)

All applicants must be licensed to practice as a registered nurse (active practitioner) in a province in Canada or in a foreign country. Applicants must have a four-year Bachelor's degree or its equivalent with a minimum "A-" standing. Introductory courses in research and statistics completed with 5 years of admission are required.

**The admission deadline for the Master of Science in Nursing is February 1.**

### **PhD (Nursing)**

All applicants must be licensed to practice as a registered nurse (active practitioner) in a province in Canada or in a foreign country. Applicants must have a first-class Masters degree in nursing or a relevant discipline or its equivalent from a recognized university.

**The application deadline for the PhD (Nursing) is February 1.**

## **Master of Nursing (MN)**

Dalhousie University School of Nursing offers a Master of Nursing program that is framed within a philosophy of primary health care that recognizes the unique strengths and contributions of individuals, families, and communities. There are two options: Nurse Practitioner and Professional stream. Students complete required courses in practice-related theory and research that are foundational to all advance nursing roles.

The Nurse Practitioner option is a 36-credit hour research and practice-based program that prepares students to be leaders in professional nursing practice. Students complete 10 courses (30 credit hours) and a final practicum (6 credit hours).

The Professional stream is a 30-credit hour course-based program that prepares students to serve as professional practice leaders. They will be key to filling leadership, policy, and management roles at all levels of the healthcare system. Students complete five required core theory courses, two focused elective courses, and three electives of their choice.

Prospective applicants are encouraged to consult the School of Nursing to identify specific clinical offerings in any academic year. Elective course(s), from a variety of fields, may be chosen in consultation with the academic advisor.

Non-nursing electives may be taken at other universities (prior approval must be obtained from the School of Nursing). Graduate nursing courses (excepting specific nurse practitioner courses) are also offered by distance education modes. Consult department for details.

## **Master of Science in Nursing (MScN)**

Dalhousie University School of Nursing offers a Master of Science in Nursing program that is framed within a philosophy of primary health care that recognizes the unique strengths and contributions of individuals, families, and communities.

The Master of Science in Nursing program initiates the preparation for a career in research and/or academia. Students are mentored to develop critical perspectives and complete a thesis. Students will engage in discovery within the strategic research foci of the School of Nursing: the health needs of people, health workforce and health systems planning, marginalized populations and health equity, and knowledge translation. Students are provided with the opportunity to work in research teams within and across disciplines.

The program of study is comprised of four theory courses and an intermediate statistics courses (for a total of 15 credit hours) and a 12-credit hour thesis.

## **Doctor of Philosophy (PhD) Nursing**

The goal of the PhD (Nursing) program is to prepare nurse scholars who will provide leadership in the advancement of nursing knowledge, nursing theory and practice, and health policy through scholarly research and the dissemination of research findings. This is a full-time program of study.

The orientation of the doctoral program is on the short- and long-term impacts of nursing practices and health outcomes at the individual, family, community, and/or population levels, or women's health outcomes specifically. The required courses and the

doctoral seminar provide forums to analyze, discuss, and critique the concepts of health outcomes and health and social policies from the perspective of nursing practice. Health related policy is addressed through the thesis, doctoral seminars, and courses in the student's substantive area.

The program is organized around the four pillars of the School of Nursing research plan. These pillars are: Health Needs of People; Marginalized Populations and Health Equity; Health Systems and Health Workforce Planning and Impact; and Knowledge Translation Research. This starting point becomes the vehicle for the student to develop an advanced understanding of research methodologies and techniques and to gain knowledge which contributes to the theoretical development and practice of nursing.

Core courses, the doctoral seminar, and the thesis are all designed to prepare students who:

- Understand the philosophical and theoretical foundations of nursing science.
- Critically analyze their own and others' perspectives in relation to research and nursing practice.
- Demonstrate the requisite cognitive skills to examine health outcomes generally, or women's health outcomes specifically.
- Develop nursing practices that improve health outcomes generally, or women's health outcomes specifically.
- Influence health and social policy to improve health and health care systems.

The program consists of:

A minimum of four core courses:

- NURS 6050: Contemporary Views of Nursing Science: Philosophy, Research, and Practice
- Two courses in the student's substantive area of study (one of which will be NURS 6200: Nursing Sensitive Health Outcomes, or NURS 6210: Women's Health Outcomes)
- An advanced research methods/design course

NURS 6300: Doctoral Seminar

Comprehensive Examination

NURS 9530: Doctoral Thesis

The PhD Comprehensive Examination in the student's area of study must be taken in the second year of the program. Comprehensive examinations may be taken only after the completion of all required course work and they cannot be taken less than one year prior to the submission of the thesis for final defence. By the end of the student's first year of study, the Thesis Supervisory Committee will be identified. It is to be comprised of the Thesis Supervisor and a minimum of two additional faculty having membership in the Dalhousie University Faculty of Graduate Studies and expertise in the student's area of research interest. The Graduate Studies Committee and the Faculty of Graduate Studies will be notified of the Thesis Supervisory Committee membership. Members of the Thesis Supervisory Committee will set the student's Comprehensive Examination.

## Immunization

Before undertaking clinical practica, Nurse Practitioner students must provide evidence of appropriate immunization and their immune status, as required by the Dalhousie University Faculty of Health and the clinical agency. This will include, but may not be restricted to, polio, diphtheria, tetanus, rubella, measles, mumps, varicella and Hepatitis B. Evidence of 2-step tuberculin testing (Mantoux) is also required.

Clinical practica courses include: NURS 5740, Advanced Health Assessment; NURS 5485, Principles and Theories for Nurse Practitioner Practice; NURS 5486, Principles and Theories for Health and Disease Management in Adult Nurse Practitioner Practice; NURS 5487, Principles and Theories for Health and Disease Management in Family All Ages Nurse Practitioner Practice; NURS 5488, Principles and Theories for Health and Disease Management in Neonatal Nurse Practitioner Practice; and NURS 5620, Advanced Practice Role Practicum.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## **Required Courses**

### **Master of Nursing Courses Required in All Program Options**

- NURS 5050.03
- NURS 5060.03
- NURS 5200.03

### **Required in Professional Stream Option**

Students are required to take a minimum of two clinical theory courses. These courses are an integration of the theories, research, and practice related to selected health-related concepts and issues in assessment and understanding of patterns of health and illness relevant to advanced practice.

- NURS 5540.03
- NURS 5550.03
- NURS 5560.03
- NURS 5570.03

Not all clinical theory courses will be offered every year, subject to faculty resources and student demand. Check with the Department.

Students may choose to complete additional clinical theory courses as open electives

Required focused electives for the Professional stream option:

- NURS 5893.03
- NURS 6000.03

Consult department regarding other possible course selections.

### **Required in Nurse Practitioner Option**

- NURS 5485.03
- NURS 5486.03 - if focus is Adult
- NURS 5487.03 - if focus is Family All Ages
- NURS 5488.03 - if focus is Neonates
- NURS 5610.03
- NURS 5620.06
- NURS 5732.03
- NURS 5735.03
- NURS 5740.03
- NURS 5893.03

### **Master of Science in Nursing Courses**

- NURS 5050.03
- NURS 5100.03



- NURS 5120.03

Students will complete one of the following clinical theory courses, aligned with their research focus:

- NURS 5540.03
- NURS 5550.03
- NURS 5560.03
- NURS 5570.03
- NURS 5000.03 or an equivalent intermediate statistics course
- NURS 9000.00

## PhD Courses

- NURS 6050.03
- NURS 6130.03
- NURS 6200.03 OR
- NURS 6210.03
- NURS 6300.03
- NURS 6800.03
- NURS 6820.03
- NURS 9530.00
- PHDP 8000.00

## Course Descriptions

### NURS 5000 Intermediate Statistics

CREDIT HOURS: 3

This course provides graduate students with a working knowledge of statistical issues and methods commonly used by researchers in the Health Professions. The statistical software package SAS is introduced and used by students throughout the course. Topics covered include a review of probability and one or two sample interferences for means and proportions. This is followed by some common experimental designs, contingency tables, and odds ratios. Final topics are correlation and linear regression (simple and multiple), analysis of variance, analysis of covariance, and logistic regression. A term data analysis project is required in which students make use of both statistical methods learned in class and the SAS software package.

PREREQUISITES: MATH 1060.03

CROSSLISTED: HESA 6500.03, HEED 5503.03, LEIS 5503.03, PHAR 5980.03, PHSE 5503.03, KINE 5503.03, STAT 5990.03

### NURS 5050 Nursing Philosophy, Knowledge and Theory

CREDIT HOURS: 3

This course explores the major philosophical and methodological underpinnings of science and knowledge. This exploration will inform a critical analysis of how nursing knowledge has evolved and will illuminate how the experience of nurses, along with the production of knowledge, meanings and values, can best be understood. Learners will develop an understanding of the assumptions underlying different research paradigms and the knowledge they generate by exploring issues such as: What is science? How has science evolved? What is knowledge? What is truth? What are the various research/science paradigms? How is knowledge translated into action?

### NURS 5060 Research and Evidence Based Practice in Nursing

CREDIT HOURS: 3

The course explores the processes of research and scholarly inquiry in nursing research utilization and knowledge to foster evidence-based practice. Students will explore the fundamental principles governing Quantitative and Qualitative research methods, identify clinical research questions, learn the essential components of literature searches and critiques, and develop a better comprehension of research utilization and evidence-based practice in the clinical setting.

### NURS 5100 Qualitative Research Methods

CREDIT HOURS: 3

In this qualitative research course, we will differentiate between method and methodology. The latter addresses all assumptions which guide research as a political process. Method refers to the ways in which data are collected, or the techniques for designing methods of analysis. Various methodologies will be

examined in detail in order to acquire an understanding of the differences in assumptions between traditional qualitative research and critical, action oriented, participatory, and feminist qualitative research.

### **NURS 5110 Qualitative Research: Learning Grounded Theory**

CREDIT HOURS: 3

In this qualitative research course, students will commence with a brief review of the assumptions associated with the Qualitative Research Paradigm, moving into a discussion of classical, Straussian, and constructivist Grounded Theory. The primary focus of this course will be on the study of the methodology and application of the methods associated with Constructivist Grounded Theory.

FORMATS: Seminar

### **NURS 5120 Quantitative Research Methods**

CREDIT HOURS: 3

There is a basic structure and process to the development of a design for scientific inquiry. This course focuses on research methods in general and quantitative research methods in particular. These research methodologies are used in nursing science as they relate to the development and/or testing of theoretical formulations, design, critique, and writing of research proposals.

### **NURS 5130 Critical Social Theory, Postmodernism and Discourse Analysis: Theory as Social Activism**

CREDIT HOURS: 3

Students will critically examine how research paradigms such as critical social theory, postmodernism, discourse analysis, feminist poststructuralism, Queer theory, Black theory, and Indigenous theory can inform social activism and political movements. Students will have the opportunity to develop their research skills and apply theory to their own research and practice.

RESTRICTIONS: Master of Nursing, Master of Science in Nursing, PhD (Nursing)

FORMATS: Seminar

### **NURS 5140 Community-Based Research Methodologies for Addressing Health Disparities**

CREDIT HOURS: 3

This graduate course will examine Community-Based Participatory Research (CBPR) to understand how this paradigm can help address the social determinants of health. Students will become familiar with key epistemological underpinnings of CBPR, ethical challenges posed by CBPR, methodological CBPR considerations in building partnerships, and knowledge translation of CBPR findings.

PREREQUISITES: A previous course or courses in qualitative research methods is an asset

RESTRICTIONS: M

FORMATS: Seminar

### **NURS 5200 Health Care System Policy Analysis**

CREDIT HOURS: 3

Health policy can be defined as “a set of interrelated decisions, taken by authorities, concerning the selection of goals and the means of achieving them” (as defined in A Code of Good Practice on Policy Dialogue). This seminar course examines critical issues and trends affecting health policy in addition to the management practices of healthcare delivery services in Canada. Students engage in analytical debate while drawing on the assigned readings, other research, and their own clinical experience. Discussions incorporate historical and global perspectives as well as a range of influencing factors to understand, test, challenge, and contrast the effectiveness of current health policy in relation to the healthcare system in Canada.

### **NURS 5330 Theoretical Concepts & Competencies Related to the Helping Relationship in Advanced Nursing Practice**

CREDIT HOURS: 3

This course examines the multiple challenges to effective interpersonal interaction in today's constantly changing, high-stress healthcare environments with multiple stakeholders. It is designed for advanced practitioners who encounter interaction challenges with clients, peers, and colleagues at staff and managerial levels. The course examines current models of helping in terms of their varied philosophical underpinnings, roles, and responsibilities. The course also considers alternative modes of helping and vehicles for interaction. A unique feature of this course is that it provides opportunities for students to practice alternate approaches and to develop advanced roles and competencies using case studies and simulated subjects.

### **NURS 5485 Principles and Theories for Nurse Practitioner Practice**

CREDIT HOURS: 3

This master's level course will introduce all nurse practitioner students to a general healthcare focus of populations across the lifespan and in multiple clinical settings. This course will consist of theories, terminology, point-of-care technology, assessment, diagnosis, and treatment directed towards a population of all ages. Theories of family, change and adult learning will be presented to guide the nurse practitioner student in the development of a holistic plan of care for health promotion and disease prevention, health maintenance, health assessment, and acute and chronic disease management.

PREREQUISITES: NURS 5740

FORMATS: Seminar

### **NURS 5486 Principles and Theories for Health and Disease Management in Adult Nurse Practitioner Practices**

CREDIT HOURS: 3

This course will expand on the nurse practitioner student's knowledge, skills, and competency in health promotion, health maintenance, health assessment and management of disease in adults. The focus is the adult population (18+) who seeks healthcare services in multiple clinical settings. A strong emphasis will be placed on health issues and common illnesses of adults with higher acuity levels and comorbidities, recognizing the acute and chronic nature of disease and targeting optimal health outcomes.

PREREQUISITES: NURS 5734.03, NURS 5740.03, NURS 5485.03

FORMATS: Seminar

### **NURS 5487 Principles and Theories for Health and Disease Management in Family All Ages Nurse Practitioner Practice**

CREDIT HOURS: 3

This course is designed for nurse practitioner students who have chosen the Family All Ages focus for their future practice. Students will utilize a family focused approach in assessing clinical and research literature as a means of developing competence in health promotion, health maintenance and cultural sensitivity in caring for clients in the community setting.

PREREQUISITES: NURS 5734.03, NURS 5740.03, NURS 5485.03

FORMATS: Seminar

### **NURS 5488 Principles and Theories for Health and Disease Management in Neonatal Nurse Practitioner Practice**

CREDIT HOURS: 3

The course focus is the neonatal population. Emphasis will be placed on the management of health issues and common illnesses of high-risk neonates, recognizing the acute and chronic nature of disease and targeting optimal health outcomes. The course will build on previous course work of advanced assessment/diagnosis/treatment using primary healthcare principles to optimize patient outcomes.

PREREQUISITES: NURS 5485.03, NURS 5732.03, NURS 5734.03, NURS 5740.03

FORMATS: Seminar

### **NURS 5540 Health Needs of People: Theoretical Insights and Application**

CREDIT HOURS: 3

This seminar course involves an examination and analysis of theories, concepts, research, and practice knowledge that is relevant to the health needs of people. This course is grounded in the primary health care philosophy of the graduate program "that recognizes and respects the unique strengths and contributions of individuals, families, and communities."

FORMATS: Seminar

### **NURS 5550 Marginalized Populations: Theoretical Insights and Applications**

CREDIT HOURS: 3

This seminar course involves an examination and analysis of theories, concepts, research, and practice knowledge regarding marginalized populations - those systematically pushed away from economic, social, political, and cultural participation and power. Students will be challenged to develop an of the unique health experiences and challenges faced by marginalized individuals who are relegated to, or find themselves on, the margins of society.

FORMATS: Seminar

### **NURS 5560 Transformative and Innovative Health Systems Planning**

CREDIT HOURS: 3

The goal of this seminar course is to explore and discuss the structure of current health care systems in both developed and developing countries (particular focus on Canada) and the multiple factors that influence how health care is designed and delivered.

FORMATS: Seminar

### **NURS 5570 Introduction to the Science and Practice of Knowledge Translation**

CREDIT HOURS: 3

This seminar course will introduce students to knowledge translation theory, practice, and research methods. The goal of the course is to highlight relationships and conflicts between different conceptual and theoretical approaches to knowledge translation.

FORMATS: Seminar

### **NURS 5610 Advanced Practice Role Development**

CREDIT HOURS: 3

The focus of this course is the role of advanced practice nurses in healthcare. Emphasis will be on the examination and critique of the role components of the clinical nurse specialist, nurse practitioner and combined roles. These components include: direct care, consultation, coaching, research, collaboration, leadership/administration and ethical decision-making. Issues surrounding the implementation of these roles within various healthcare contexts and clinical specialties will be discussed.

### **NURS 5620 Advanced Practice Role Practicum**

CREDIT HOURS: 6

This course provides the student with the opportunity to integrate, synthesize and analyze previously developed knowledge and skills in an intensive clinical practice experience directly related to the student's chosen client population/discipline in an advanced nursing practice role. Practice settings will offer experiences with clients experiencing acute and chronic illness states with multiple and complex care needs. While implementing the advanced practice role, students will consider the organizational, political, and healthcare policy-related issues that relate to advanced nursing practice and change in healthcare delivery that affect role development and implementation.

PREREQUISITES: NURS 5486.03, or NURS 5487; NURS 5732.03; NURS 5734.03; NURS 5735.03; NURS 5740.03; NURS 5610.03 is a pre or co-requisite

FORMATS: Other (explain in comments)

### **NURS 5630 Integrated Professional Practicum for Registered Nurse (RN) Prescribing (P)**

CREDIT HOURS: 3

The Integrated Professional Practicum for Registered Nurse Prescribers [RN (P)'s] prepares nurses with a minimum of three (3) years' experience working in their 'area of clinical competence' (employer designated area) to prescribe in collaboration with a primary care provider, Physician or Nurse Practitioner. A clinical practicum in the learners work environment is required.

CALENDAR NOTES: • The student learner must be a Registered Nurse in good standing with the Nova Scotia College of Nursing. • The student learner must be supported by their employer and have a collaborative practice agreement in place with a primary care provider in their area of clinical practice.

PREREQUISITES: NURS5740, Advanced Health Assessment, and NURS5736, Pharmacotherapeutics for Registered Nurse Prescribing

### **NURS 5732 Pathophysiology for Advanced Nursing Practice**

CREDIT HOURS: 3

This course uses an evidence-based conceptual approach to critically and comprehensively examine pathophysiologic phenomena relevant to advanced nursing practice. The phenomena examined are commonly encountered in acute and long-term illnesses, are alterations in function involving multiple body systems, are seen across the boundaries of age, disease entities, and clinical states, and are those for which nurses have a major role in assessing, monitoring, managing, and evaluating. Seminars are framed to systematically and critically examine the impact of these pathophysiologic phenomena on cell function, host defense responses, maintenance of vital functions, and neuro-endocrine-immune responses in individuals and groups across the lifespan.

### **NURS 5734 Principles of Pharmacotherapy for Nurse Practitioners**

CREDIT HOURS: 3

This course focuses on core principles of pharmacotherapy relevant to all nurse practitioner practice. Pharmacotherapeutic problem solving approaches will be introduced and applied throughout the course. Effective and strategic use of drug and therapeutic information resources will be emphasized. Relevant issues to pharmacotherapeutic policy will be addressed. Principles of pharmacokinetics and pharmacodynamics will be introduced and integrated throughout therapeutic content areas. Legal and ethical responsibilities related to prescriptive authority and pharmacotherapeutic interventions will be addressed.

### **NURS 5735 Pharmacotherapeutics for Nurse Practitioners**

**CREDIT HOURS: 3**

The course focuses on clinical applications of drug therapies relevant to nurse practitioner practice. Students will be given the opportunity to gain knowledge in order to integrate pharmacokinetic and pharmacodynamic concepts for a chosen client population in their clinical setting and practicum. Students will gain therapeutic knowledge that includes the mechanism of actions, usual dosages, absorption, distribution, metabolism, elimination, and therapeutic use of medications. Principles of management for side effects and drug interactions of medications frequently encountered by nurse practitioners will be reviewed and applied. Additionally, students will be provided with the opportunity to identify and utilize timely and appropriate drug information resources that are applicable to their daily practice. Legal and ethical responsibilities related to pharmacotherapeutic interventions are addressed.

**NURS 5736 Pharmacotherapeutics for Registered Nurse (RN) Prescribing (P)****CREDIT HOURS: 3**

This course will develop learners' understanding of how medications work across the lifespan and the factors that influence medication selection taking into account pharmacotherapeutics, pharmacokinetics and pharmacodynamics as well as broader considerations such as patient preference, ethics, safety, and cost-effectiveness. Learners will develop a comprehensive understanding of the legal basis for prescribing as well as techniques to monitor, record and modify medications and or refer patients as appropriate.

FORMATS: Seminar

**NURS 5740 Advanced Health Assessment****CREDIT HOURS: 3**

This course prepares students to perform advanced health assessments of young, middle-aged, and elderly adults who are healthy, as well as those who are experiencing illness. It will focus on the knowledge, skills, and processes required for advanced health assessment. Students will develop competence in completing focused and comprehensive health assessments including history taking, physical examination, synthesis, critical analysis, diagnostic reasoning, clinical judgement, and interpretation of health data. Students will further develop their understanding of the pathophysiological basis of clinical findings and will integrate an increasing knowledge of pathophysiology and pharmacology as a basis for formulating a plan of care. Elements of an advanced health assessment include physical and mental health, psychosocial, family, cultural, and community factors, the determinants of health, and risk appraisal as they relate to a client's health status. Clinical, theoretical, and scientific knowledge will be synthesized in the identification and management of existing and potential states of health and illness. Approaches to effective written and verbal communication of advanced health assessments to lay and health professional colleagues will be addressed. It is expected that students will be competent in basic health assessment techniques prior to beginning the course. All students will develop an Individual Learning Plan [ILP] to guide their learning experience.

FORMATS: Lab | Seminar

**NURS 5810 Reading Class****CREDIT HOURS: 3****NURS 5820 Reading Class****CREDIT HOURS: 3**

See NURS 5800.

**NURS 5830 Palliative Care Nursing****CREDIT HOURS: 3**

This course provides an overview of the significant issues facing individuals and their families related to life threatening illness, dying, and the promotion of quality of life. An exploration of one's own attitudes, beliefs, and values regarding death and dying provide a foundation for examination and discussion of course content. An analysis of the principles and standards of palliative care, principles of primary healthcare, methods of assessment, and means of pain and symptom management guide delivery of care. Emphasis on communication, collaboration within teams, ethical issues, spiritual and cultural influences, and grief and coping provide opportunities for reflection and discussion. Online resources offer opportunities for students to enhance their knowledge and understanding of course content.

CROSSLISTED: NURS 4060.03

**NURS 5850 Women and Aging****CREDIT HOURS: 3**

As women grow older the experience of aging is generally more difficult for them than for men. Somewhere in mid-life, anxieties about the aging process exacerbate the difficulties facing women in modern society. Disempowering older women is usually accomplished in small increments. "Old woman" is a

pejorative label; the older a woman becomes, the less credibility she generally has; this is especially true for women of color, poor women, lesbians, and women who are physically challenged. While aging is a biological phenomenon, ageism is socially constructed. Specifically, under patriarchy, older women are seen as a burden, desexualized, and segregated by both men and younger women. They are usually not taken very seriously, nor seen as a threat. This course will explore the issues related to social, psychological, political, and economic factors that are major determinants to the well-being of aging women based upon race, gender, sexual orientation, disabilities, and class inequities.

CROSSLISTED: NURS 4370.03, SOSA 3245.03, SOSA 5245.03, GWST 3810.03

### **NURS 5871 Addictions Nursing Practice**

CREDIT HOURS: 3

This Web-based course examines dominant discourses within nursing and other disciplines that underlie addiction treatment practices. Students will critically analyze how established and emerging paradigms inform addictions nursing practice with individuals, families, and communities. Learners will consider the interplay of broader gender, social, and cultural circumstances, and addictions.

CROSSLISTED: NURS 4371.03

FORMATS: Seminar

### **NURS 5891 Health Informatics**

CREDIT HOURS: 3

This course will provide an introduction to Information Technology and Systems as it relates to practice, research, administration, and education for health professionals. Students will be introduced to information technology and provided with opportunities to use critical thinking in analyzing the implication of information systems for healthcare. This course will be taught using interactive distance technology. Students will be required to contribute to class discussion through a Web-based bulletin board.

CROSSLISTED: NURS 3310.03

### **NURS 5892 Specialty Practice of Oncology Nursing**

CREDIT HOURS: 3

This course will focus on adults with cancer. Course content will reflect a critical analysis of the existing theories that influence health related behaviours, health promotion, illness prevention, and decision making. Contextual issues within the broad social, economic, and cultural environments of cancer care will be addressed.

CROSSLISTED: NURS 4351.03

### **NURS 5893 Health Program Planning and Evaluation**

CREDIT HOURS: 3

The focus of this course is on the theoretical and practical knowledge and abilities required for the cycle of health program planning and evaluation (HPPE) in contemporary healthcare. Students will build their own theoretical knowledge related to program planning approaches, evaluation models, theories, and methods of data collection. Knowledge translation will be discussed, analyzed, and critiqued including the contextual influences in program planning and evaluation such as ethics, politics, evaluator roles and stakeholder involvement. Prior knowledge of research methods will be beneficial.

### **NURS 5894 Interprofessional Psychosocial Oncology: Introduction to Theory and Practice**

CREDIT HOURS: 3

This course provides graduate students in five core disciplines an opportunity to develop an understanding of psychosocial oncology. Case based learning in small interprofessional groups will allow students to explore key learning themes relevant to psychosocial oncology, and to develop an understanding and interpretation of the cancer experience and beginning competency in psychosocial oncology assessment, interprofessional collaboration, and cultural safety.

### **NURS 5895 Introduction to Epidemiology Methods in Nursing Practice**

CREDIT HOURS: 3

This introductory course is intended to provide students with a working knowledge and understanding of the basic concepts and methods of epidemiology. The focus of this course will be the analysis and interpretation of information about disease and other health related occurrences at a population level within a Public Health Nursing context. This course will also introduce students to concepts for developing and evaluating public health programs. A clinical background and a basic understanding of statistics are an asset but not necessary.

PREREQUISITES: There are no prerequisites for this course, though students are required to have completed the second year of their undergraduate program or have permission from the course instructor. A clinical background and a basic understanding of statistics for the Graduate students are strongly advised but not necessary for the Undergraduate students.

CROSSLISTED: NURS 4380.03

### **NURS 5897 Relational Practices with Families in Oncology and Palliative Care**

CREDIT HOURS: 3

The course provides students in five disciplines (medicine, nursing, psychology, social work, spiritual care) with opportunity to explore the interprofessional care of families experiencing cancer along the illness trajectory from diagnosis through to bereavement or long-term survivorship. Key themes that will be explored include: family theory, models of family and couple counselling/therapy, family assessment, therapeutic conversations and interventions.

FORMATS: Seminar

### **NURS 5899 Sexual Health and Counseling in Cancer**

CREDIT HOURS: 3

Cancer causes wide-ranging impacts on sexual health, but many health care professionals do not feel confident about addressing sexual health needs. This course is designed to provide graduate students in the health professions with the knowledge and skills to intervene with sexual health problems that arise in cancer.

FORMATS: Seminar | Online Delivery

### **NURS 5950 Self-directed Learning in Nursing**

CREDIT HOURS: 3

This elective provides an opportunity for students to carry out an independent study or project related to healthcare, with assistance from the faculty facilitator and resource persons. Students will systematically identify, plan, execute and evaluate a learning project relevant to nursing practice, administration, or education.

CROSSLISTED: NURS 4330.03

### **NURS 5990 Interdisciplinary Human Nutrition**

CREDIT HOURS: 3

Students will acquire current information about the basic principles of human nutrition and nutritional requirements throughout the life cycle. They will also analyze a variety of psychological, social, economic, physical, educational, and cultural factors which influence eating habits. Appropriate nutrition-related community resources will be identified. The students will gain an insight into the similarities of classmates' educational backgrounds and a further understanding of their professional roles, thus enhancing possibilities for interdisciplinary cooperation in future clinical areas and the community.

CROSSLISTED: NURS 4800.03, HEED 2250.03, PHYT 3090.03, PHAR 4850.03, KINE 5990.03

### **NURS 6000 Healthcare Leadership in the 21st Century**

CREDIT HOURS: 3

This course focuses upon the changing role and expectations for healthcare managers and leaders within the Canadian healthcare system. Class topics include leadership/organizational theories, values-based leadership, leadership theories, and evidenced based practice. Strategies for addressing common leadership/management challenges are covered through a variety of course activities including extensive readings, case studies, student presentations, and papers.

CROSSLISTED: HESA 6000.03

### **NURS 6050 Contemporary Views of Nursing Science: Philosophy, Research, and Practice**

CREDIT HOURS: 3

This course explores the philosophy underlying the ontological, epistemological, and ethical approaches to nursing and its practices. Both learner and educator will critically analyze, reflect, and dialogue in a relational, scholarly, and intersubjective learning space. An in-depth understanding of the diverse research traditions that exist within the discipline of nursing and the unique body of knowledge that evolves within each tradition will be illuminated.

FORMATS: Seminar

### **NURS 6130 Measurement in Nursing Phenomena**

CREDIT HOURS: 3

This course is designed to prepare learners to develop and share nursing knowledge in methodological and measurement issues as an evolving field in today's research environment. The preparedness of nursing science to embrace critical multiplism from the perspective of methodology, measurement, and evaluation will be interrogated.

### **NURS 6200 Nursing Sensitive Health Outcomes**

CREDIT HOURS: 3

Conceptual, philosophical, theoretical, epistemological, methodological, and feasibility issues central to health outcomes research are examined. The concept of health outcomes and related health and social policies from the perspective of nursing practices are analyzed and critiqued. The impacts of nursing practices on health outcomes at individual, family, community, and population levels will be discussed, analyzed, and critiqued.

### **NURS 6210 Women's Health Outcomes**

CREDIT HOURS: 3

The course provides a forum to analyze, discuss, and critique philosophical, conceptual, theoretical, methodological, and feasibility issues central to women's health outcomes research and nursing practice from a gender-based and diversity analysis perspective and the relationship to health and social policies. The short- and long-term impacts of nursing practices on women's health outcomes and nursing practice at the individual, family, community, and population levels will be analyzed.

### **NURS 6300 Doctoral Seminar**

CREDIT HOURS: 3

The goal of the doctoral seminar is for students and faculty to share the findings from their research, engage in scholarly debate, and foster scholarship. The seminar will facilitate proposed and ongoing research between and among doctoral students, faculty members, and other key stakeholders. Focus is on the critical examination of the research process in nursing, health service delivery, and policy decision-making with an emphasis on maintaining the links between the research problem, theory, and research methods. Consideration is given to both quantitative and qualitative research approaches, designs, and data collection and analysis. Knowledge translation as a core component of research design will be discussed. Strategies for critically analyzing research studies and for utilizing findings are examined.

CALENDAR NOTES: Students taking this course must register in NURS 6300 in both the Fall and Winter term; Successful completion of fall components will result in a grade of IP, with a final grade assigned for the course in the Winter.

### **NURS 6800 Directed Doctoral Study**

CREDIT HOURS: 3

This course offers doctoral students the opportunity to undertake further study in a specific topic of interest that is not covered by regular course offerings. The student will be supervised by a faculty member who is competent in the area of interest. Regular meetings between the student and the supervising faculty member will be held. The method of evaluation will be contracted by the student and supervising faculty member.

### **NURS 6820 Doctoral Reading Course**

CREDIT HOURS: 3

This course offers doctoral students the opportunity to undertake further study in a specific topic of interest that is not covered by regular course offerings. The student will be supervised by a faculty member who is competent in the area of interest. Regular meetings between the student and the supervising faculty member will be held. The method of evaluation will be contracted by the student and supervising faculty member.

### **NURS 8000 Health Policy Practicum**

CREDIT HOURS: 0

This practicum provides students with an opportunity to build knowledge and skills regarding health policy development, its application and/or evaluation. The practicum will focus on one particular policy relevant to the student's discipline/field of practice and will be tailored to individual student needs. The focus of the practicum can be generated from student work completed in other courses, or as a new topic of interest. The practicum is offered to any Master of Nursing student who elects the Policy option. Graduate students from other health-related disciplines are also eligible for this practicum subject to the availability of faculty expertise and resources.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **NURS 8893 Clinical Plc - Arctic Nurs III**

CREDIT HOURS: 0



## NURS 9000 Masters Thesis

CREDIT HOURS: 0

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

## NURS 9530 Doctoral Thesis

CREDIT HOURS: 0

# Occupational Therapy

Location:

(Atlantic) School of Occupational Therapy/Forrest Building

5869 University Avenue

Room 215

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## Introduction

Located within the Faculty of Health, the Atlantic School of Occupational Therapy was established in 1982. The regional orientation of the School fosters collaborative teaching, research and professional activities linking those at the university with service providers, government workers, related disciplines, and citizens in the four Atlantic Provinces. This regional mandate is combined with an international perspective linking Dalhousie with universities and communities for fieldwork and research. The School of Occupational Therapy offers two MSc degrees: 1) an in-person clinical degree to become an occupational therapist and 2) a fully online degree in occupational science, with coursework-only or thesis-based options.

**Occupational Therapy:** Occupational therapy is a regulated *health profession* concerned with promoting participation in meaningful and desired daily life occupations (e.g., caring for the self or home, engaging in leisure pursuits, working, studying). Occupational therapists work to promote justice and equity so that all persons have the opportunity and ability to engage in meaningful daily occupations. Within occupational therapy, health is viewed broadly as having the ability, opportunity, and resources, for quality of life with meaningful engagement in desired activities in supportive environments.

As a regulated health profession, occupational therapists use their unique and diverse knowledge and skills to enable individuals, groups, and organizations to overcome obstacles that limit their ability to do the things they need and want to do. Obstacles addressed by occupational therapists may include illness, injury, physical or mental disability, developmental delay, social disadvantage, old age, and environmental barriers within the home, community, and workplace. The focus of occupational therapy is to enhance occupational performance and engagement through enabling individual change, occupational change and/or enabling change in physical and social environments, policies, or legislation. Strategies may facilitate change in skills, attitudes, routines, design of buildings, use of assistive technology, policies, etc.

The role of an occupational therapist is varied and challenging. Occupational issues are never the same because no two people or environments are ever exactly the same. The challenge for occupational therapists is to plan and implement the “just right” program or strategy for each and every client so that everyone can achieve just opportunities to participate in society.

**Occupational Science:** Occupational Science is an interdisciplinary field in the social, health and behavioral sciences that studies the nature and function of human occupation (the things people do in their everyday lives) as it relates to the health and well-being of individuals, communities, and societies. Occupation in this field of study is viewed broadly to include everything we do to “occupy” ourselves such as enjoying life, looking after ourselves and others, and contributing to the social and economic productivity of our communities. Simply put, occupations are all the things we want, need, or have to do. Occupational Science explores what people

do and why, as well as the meanings ascribed to doing, by individuals and the broader society. Not only does occupational science provide foundational research that can inform occupational therapy, the science of doing can inform and build on work in many different fields. The MSc in Occupational Science is an online graduate degree, involving a thesis or major project, that teaches students to complete research related to the science of doing, with a particular focus on critical thinking, research methodologies and social change. An MSc in Occupational Science provides a foundation for further research or work that guides change in organizational, health, accessibility, or public/social policy that can support improvements in human and social capital. Such research and work can contribute to industry, government and the private sector across multiple fields and disciplines, such as, but not limited to: policy studies, accessibility and inclusion, critical health or disability studies, disability management, mental health, occupational health and safety, occupational therapy, leisure and recreation, organizational management and planning, to name a few. Please note that although an MSc in Occupational Science would provide an excellent foundation for study in occupational therapy, this degree does NOT lead to becoming an occupational therapist, a regulated health professional.

## Staff

### Director

**Shaw, L. E.,** BSc (OT), MSc (OT), PhD (Western)

### MSc (Occupational Therapy) Graduate Coordinator

**MacKenzie, D.,** BSc Physical Education (Saskatchewan), BSc (OT) (Alberta), MA (Ed) (MSVU), PhD (Dalhousie). Observation and eye movement, Neurological rehabilitation, and interprofessional education

### MSc (Occupational Therapy - Post-Professional) Graduate Coordinator

**Lauckner, H.,** BSc (OT), MSc, PhD (Queen's). Community development and occupational therapy; community-based rehabilitation; qualitative research; fieldwork education

### Professors Emeriti

**O'Shea, B.,** DipP & OT (Toronto), BSc (Queens), MS (Colorado State), LLD (Dalhousie), Honourary PhD. Occupation as a determinant of health; curriculum design for professional studies; cross-cultural transfer of knowledge

### Professors

**Beagan, B.,** BA, MA (Dalhousie), PhD (UBC). Sociology of health and illness, health profession education, social inequality, research methodology

**Packer, T.,** BSc (OT) (Western) MSc, PhD (Queen's). Self-Management of disability and chronic disease

**Shaw, L. E.,** BSc (OT), MSc (OT), PhD (Western). Occupational transitions, hearing in the workplace, return to work and employment disparities, and chronic pain

### Associate Professors

**Kiepek, N.,** BSc (Hon), MSc (OT) (Toronto), PhD (Western). Substance use, unsanctioned occupations, deviance, critical discourse analysis, discursive practices

**MacKenzie, D.,** BSc Physical Education (Saskatchewan), BSc (OT) (Alberta), MA (Ed) (MSVU), PhD (Dalhousie). Observation and eye movement, Neurological rehabilitation, and interprofessional education

**Merritt, B.,** BS (Psychology), MS (OT), PhD (Colorado State). Occupation-based assessment, occupational therapy theory, educational leadership, efficacy of occupation-based practice

**Phelan, S.K.,** BSc (Hon) (Guelph), MSc (OT), PhD (Western). Critical Disability, Childhood Disability, Children's Culture, Qualitative Methodology.

**Warner, G.,** PhD (Epidemiology) (Case West Reserve Univ). Measurement and Evaluation, Health Services Research, Knowledge Transfer and Exchange, Health System Change to improve participatory outcomes

### Assistant Professors

**Askari, S.,** BSc(OT) (Shahid Beheshti University of Medical Sciences), MSc(OT) (Iran University of Medical Science), BA (Payam Noor University), PhD (McGill)

**Dieleman, C.,** BSc (OT) (Western), MSc, PhD (Queen's). Mental health care for criminal offenders with mental illness, policy implementation in dual prison hospitals, understanding crime as occupation

**Ghanouni, P.**, BSc(OT), MSc(OT) (Shahid Beheshti University of Medical Sciences), PhD (UBC)

**Lauckner, H.**, BSc (OT), MSc, PhD (Queen's). Community development and occupational therapy; community-based rehabilitation; qualitative research; fieldwork education

### **Senior Instructor**

**Harris, J.**, BScHon (Kinesiology), MSc Kinesiology, MSc(OT), (Dalhousie)

**Landry, K.**, BSc (OT), MSc (Rehabilitation Research-Physiotherapy) (Dalhousie)

### **Instructor**

**O'Keefe, C.**, BSc (OT), MSc (OT Post Professional) (Dalhousie)

### **School Fieldwork Education Coordinator**

**Harris, J.**, BScHon (Kinesiology), MSc Kinesiology, MSc(OT), (Dalhousie)

### **International Fieldwork Education Coordinator**

**Lauckner, H.**, BSc (OT), MSc, PhD (Queen's)

### **Cross Appointments**

**Gahagan, J.**, BA (Hons) (Carleton), MA (Windsor), PhD (Wayne State)

**Hutchinson, S.**, BA (Univ Vic), MA (Dalhousie), PhD (Georgia)

**Manuel, P.**, BA (Carleton), MSc (McGill), PhD (Dalhousie)

**Waldron, I.**, BA (McGill), MA (Univ of London), PhD (Toronto)

**Weeks, L.**, BSc (UPEI), MSc (U of Maine), PhD (Virginia Tech)

### **Adjunct (FGS)**

**Audulv, A.**, PhD (Mid Sweden Univ)

**Eagles, D.**, MD, MSc (Ottawa)

**Rebeiro Gruhl, K.**, BSc(OT), Masters Certificate OT (Research) (Western), PhD (Laurentian)

**Nourpanah, S.**, PhD (Dalhousie)

## **Master of Science (Occupational Therapy) (MSc OT) to enter the profession**

### **Introduction**

The MSc (OT) program was implemented in 2006 and replaced the BSc (OT) program of study. The MSc (OT) program is a full-time, on-site program of study that is designed to prepare students to enter into the profession of occupational therapy. The program is fully accredited by the Canadian Association of Occupational Therapists (CAOT) and approved by the World Federation of Occupational Therapists. The program is 22 months in total, beginning in September and concluding in June. Following the completion of their program, students are eligible to write the CAOT national certification examination in July or November, which in turn provides eligibility for licensure by provincial, territorial, and international regulatory bodies. Graduates have a wide range of employment options in Canada and abroad.

1. MSc (OT) Program: 78 credit hours full-time study, 22 consecutive months (six semesters)
  - a) Academic component: 57 credit hours
  - b) Interprofessional health education component: Within the 22-month program, students will engage in a constellation of required interprofessional collaborative learning experiences. Students are required to maintain continuous registration in the Interprofessional Health Education Course (IPHE 5900) for the duration of the program.
  - c) Fieldwork component: 21 credit hours for a minimum of 1000 hours. Students may be assigned to fieldwork sites in any of the four Atlantic provinces. Normally, a student will complete no more than one fieldwork course in the Halifax/Dartmouth area. Applicants who anticipate difficulty meeting fieldwork requirements are strongly encouraged to contact the School Fieldwork Education Coordinator to explore options early in their first academic term. National and

International fieldwork options may be available.

2. Single courses: with Entry Level Graduate Program Coordinator and Instructor permission, see [Regulation 4.3.7](#).

## Admission Requirements MSc (OT)

- Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies
- Admission to the MSc (OT) program requires the completion of a four-year Bachelor's degree in any field of study at a recognized academic institution, with a minimum B average (73-76%), calculated on the last 60 credit hours of the degree.
- Two prerequisite courses are required.
  - Three credit hours in **human physiology** and
  - Three credit hours in **human/vertebrate anatomy**.

One three-credit course will not be considered to meet the requirements for both anatomy and physiology. You must apply with three-credit hours in each.

The three-credit hour human physiology prerequisite course should contain study of the following system content: cell, endocrine, neural, muscle, cardiovascular, respiratory, renal, and gastrointestinal.

The three-credit hour human anatomy prerequisite course should enable the student to explain and describe, at a basic level, the gross anatomy and histology of the human body. Content topics of the course should include study of the following: development, cells, tissues, skeletal, muscular, integument, nervous, cardiovascular, digestive, respiratory, renal, and reproductive systems.

- Reference Letters - two academic confidential letters
- Admission into the program is limited, typically ranging from 60 to 70 students. Admissions is on a competitive basis with preference given to residents of the Atlantic Provinces. The provincial quota system defines a specific number of allocated seats for students from New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island.
- Single Courses: with Entry Level Program Coordinator and Instructor permission (see [Regulation 4.3.7](#)). The admission category is Special Student-Graduate Studies (SSGS).

## Application

### *All applicants must complete*

- The Faculty of Graduate Studies Application for Admission Forms which are available at [www.dalgrad.dal.ca/admissions/](http://www.dalgrad.dal.ca/admissions/) and,
- The School of Occupational Therapy's Supplementary Occupational Therapy Application form, available at [occupationaltherapy.dal.ca/Files/MScOT\\_Supplementary\\_Application\\_Form.pdf](http://occupationaltherapy.dal.ca/Files/MScOT_Supplementary_Application_Form.pdf)
- Affirmative Action: The School of Occupational Therapy is committed to the professional advancement of qualified occupational therapists who are persons with disabilities and/or who are members of the African Canadian or Aboriginal communities of the Atlantic region. Fully qualified applicants from these groups will be given preference in admissions. If you belong to one of these groups and wish to take advantage of this policy, you may voluntarily provide this information about yourself on application. Please note that students who request accommodations for a disability of any type are required to be registered with the Dalhousie Advising and Access Services Centre.

### *Application Deadline MSc (OT) Program:*

- January 31 is the deadline for submission of the Faculty of Graduate Studies Application for Admission Forms and the Supplementary Occupational Therapy Application Form to the School of Occupational Therapy. All final transcripts for courses that are still in progress must be received by June 15 of the admission year in order for the application to be considered by the Admissions Committee, even if a student has been placed on the waitlist for acceptance.

### *Special Student - Graduate Studies Application Deadlines*

- Fall Term: August 1
- Winter Term: December 1
- Spring/Summer Term: April 1

## **Program Information**

### ***Pre-placement Requirements***

Fieldwork education, the practice component of the educational program, takes place in a variety of practice sites where students may be exposed to, or be carriers of communicable diseases which are vaccine preventable. Prior to fieldwork, students must meet the immunization requirements as indicated in the "Immunization Record" and "Mandatory Tuberculosis Skin Test" - see: [www.dal.ca/faculty/healthprofessions/current-students/student-policies-and-procedures.html](http://www.dal.ca/faculty/healthprofessions/current-students/student-policies-and-procedures.html)

The School also requires students to complete CPR (level C), and to provide a Criminal Record Check, a Vulnerable Sector Check, and proof that they are not on the Child Abuse Registry. Additional requirements may be requested by individual sites, and are the responsibility of the student.

### ***Transfer Credits***

Normally, transfer credits are not granted for OCCU courses.

### ***Academic Dismissal***

A student may be dismissed from the School of Occupational Therapy for academic reasons/nonacademic reasons without prior permission. See also [Regulation 5.4](#)

### ***Fieldwork Costs***

Students enrolled in entry-to-practice graduate programs of study in the Faculty of Health Professions are advised that they may have to do some or all of their required clinical education/fieldwork at sites outside Halifax, and hence may have to incur additional personal expenses for travel and temporary accommodation.

In some situations, sites may require a payment to the site for support of clinical education/fieldwork supervision, and some sites may require separate disability insurance in lieu of eligibility for Worker Compensation coverage. Such costs are the responsibility of the student.

The School of Occupational Therapy is committed to rural health practice. Students may receive some travel and accommodation support through the School's Rural and Remote Fieldwork program.

### ***Awards, Scholarships, Bursaries***

Refer to [www.occupationaltherapy.dal.ca](http://www.occupationaltherapy.dal.ca) for information regarding awards, scholarships, and bursaries for the entry-level MSc (OT) program.

### ***Policy Statement on Interprofessional Health Education***

Students in the Faculties of Dentistry, Health Professions and Medicine are required to participate in interprofessional health education activities. These activities, together with specific program requirements, are currently evolving and in transition and are integrated into the curricula of individual programs. Participation is mandatory. The objectives of interprofessional education in the Faculty of Health Professions include developing:

- knowledge and understanding of, and respect for, the expertise, roles and values of other health and human service professionals.
- understanding the concept and practice of patient/client/family-centred care.
- effective communication, teamwork and leadership skills applied in interprofessional contexts.
- positive attitudes related to the value of collaboration and teamwork in health and human service contexts.
- an understanding, from a multi-disciplinary perspective, of the Canadian health and social systems, the legal and regulatory foundation of professional practice, how health and human service institutions are organized and operate, and how different health and human service professions contribute to the systems and institutions.

### ***Required Program of Study for MSc (OT) students***

Students admitted to the MSc (OT) program will enroll in the full-time program of study documented in the Table below. Progression to each semester of the program is contingent upon completion of all program courses in the previous semester. While each student will maintain continuous enrollment in IPHE 5900 for the duration of the MSc (OT) program, the grade (pass/fail) for this course will

not be submitted until the final term of the student's program. Please register in IPHE 5900.00 (section 3). Students must successfully complete all program courses to meet the requirements for graduation. (Note: Student pays program fee for two academic years = six terms).

**Year 1- 45 credit hours - 12 months September - August**

**Fall Term: Sept - Dec (On-Site) 18 credit hours**

IPHE 5900.00: Interprofessional Health Education Portfolio (0 cr hr)  
OCCU 5000.03: Theories of Occupation, Enabling and Justice (3 cr hr)  
OCCU 5011.05: Enabling Occupation 1: Mental Health (5 cr hr)  
OCCU 5012.04: Health Conditions, Pharmacological Management, and their effect on Occupational Performance (4 cr hr)  
OCCU 5003.03: Dimensions of Professional Practice (3 cr hr)  
ANAT 5000.03 Clinical Anatomy (3 cr hr)

**Winter Term: Jan - mid-Apr (On-Site) 18 credit hours**

IPHE 5900.00: Interprofessional Health Education Portfolio (0 cr hr)  
OCCU 5004.03: Occupational Assessment and Occupational Analysis (3 cr hr)  
OCCU 5015.05: Enabling Occupation 2: Musculoskeletal Therapeutics (5 cr hr)  
OCCU 5006.03: Wellness and Inclusion by Design and Technology (3 cr hr)  
OCCU 5112.03: Fieldwork I: (3 cr hr)  
OCCU 5017.04: Research Approaches and Evidence-Based Practice for Occupational Therapists (4 cr hr)

**Spring Term: (flex delivery): May-August 9 credit hours**

IPHE 5900.00: Interprofessional Health Education Portfolio (0 cr hr)  
OCCU 5222.06: Fieldwork II: (6 cr hr)  
OCCU 6002.03: Social Influences on Occupational Performance (3 cr hr)

**Year 2 - 33 credit hours - 10 months September - June**

**Fall Term: September-December (On-Site) 14 credit hours**

IPHE 5900.00: Interprofessional Health Education Portfolio (0 cr hr)  
OCCU 6001.05: Enabling Occupation 3: Neurotherapeutics (5 cr hr)  
OCCU 6140.06: Neuroscience for Occupational Therapy (6 cr hr)  
OCCU 6006.03 Applied Research for Occupational Therapist (3 cr hr)

**Winter Term: January-April (Off-Site) 12 credit hours**

IPHE 5900.00: Interprofessional Health Education Portfolio (0 cr hr)  
OCCU 6111.06: Fieldwork III (6 cr hr)  
OCCU 6222.06: Fieldwork IV (6 cr hr)

**Spring Term: May - June (On-Site) 7 credit hours**

IPHE 5900.00: Interprofessional Health Education Portfolio (0 cr hr)  
OCCU 5043.03: Program Evaluation for Occupational Therapists (3 cr hr)  
OCCU 6013.04: Advanced Practice Issues (4 cr hr)

## **Master of Science in Occupational Science**

# Master of Science in Occupational Science

## Introduction

Occupational Science is an interdisciplinary field that studies the nature and function of human occupation (the things people do in their everyday lives) as it relates to individuals, communities, and societies.

This online degree is well suited for students with diverse undergraduate degrees, and with occupational therapy degrees that have a commitment to exploring the science of everyday doing.

The program learning outcomes are:

1. Apply occupational science related concepts to analyze policies, theories, and social norms to enhance occupation.
2. Understand and apply a variety of research methodologies to address occupation-focused phenomena.
3. Demonstrate how occupational science has the potential to transform epistemologies, policies, procedures, and practices in multiple settings, and across diverse contexts.

This innovative online program can be completed either full or part-time. Full time, there will typically be one year of courses and one additional year of thesis work for those pursuing the thesis option or 1 additional year for their major project for those completing the course-based option. Students will require regular and consistent access to the internet to participate successfully in this fully online distance education program.

## Admission Requirements

Admission to the MSc (OS) program is open to candidates who have completed a four-year baccalaureate degree in a field which can be related to the interdisciplinary field of Occupational Science, per FGS admissions regulation. Students must meet the minimum requirements for admission set out by FGS. (see Graduate Studies Academic Calendar, Faculty of Graduate Studies Regulations 3.2).

Priority will be given to applicants who demonstrate the most favourable combination of academic excellence, leadership experiences, referee recommendation, and passion for the interdisciplinary field of occupational science. Priority will be given to full-time thesis students.

Drawing on the Dalhousie University Faculty of Health Equitable Admissions Policy, the School of Occupational Therapy is committed to improving the representation of Aboriginal/Indigenous students (especially Mi'kmaq), persons of African descent (especially African Nova Scotians), members of other racialized groups, Acadians, persons with dis/Abilities, and students belonging to sexual orientation and/or gender identity (SOGI) minority groups. Applicants from these groups who meet the application requirements will be given preference in admissions. If you self-identify with one or more of these groups and wish to be considered under this policy, you may voluntarily provide this information about yourself in your supplemental application.

## Application Process

All Program applicants must submit

- Faculty of Graduate Studies Application Forms which are available at [www.dalgrad.dal.ca/admissions](http://www.dalgrad.dal.ca/admissions);
- If applicable, proof of English language competency
- Letter of Intent;
- Curriculum Vitae;
- Two letters of Academic Reference which MUST be submitted via the online electronic reference system (see [https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission\\_requirements/admission\\_process.html](https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admission_requirements/admission_process.html))

- Two copies of official transcripts of all university courses;
- Supplementary form

Applicants interested in taking a single course may seek admission under the Special Student-Graduate Studies (SSGS) category. [https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admissions\\_requirements/admission\\_process.html](https://www.dal.ca/faculty/gradstudies/graduate-programs-admissions/admissions_requirements/admission_process.html). Applicants who meet FGS criteria, and who have the permission of the MSc(OS) Program Coordinator may enroll in courses in this program. Note that while up to 6 credit hours may be transferred into a graduate program, this will not alter the program start date, nor the program fee required for that graduate program. Even if a student has completed a course as an SSGS student and is admitted to the MSc in Occupational Science Program at a later date, full MSc(OS) program fees will apply.

## **Special Student -Graduate Studies (SSGS) (No-Degree, For Course Specific Admission)**

Applicants who meet FGS criteria, and who have the permission of the MSc(OS) Program Coordinator may enroll in courses in this program. Note that while up to 6 credit hours may be transferred into a graduate program, this will not alter the program start date, nor the program fee required for that graduate program.

## **Application Deadlines**

MSc(OS) Program Admissions for Canadian and Non-Canadian Applicants Application deadline is **January 31**, and review of applicants will begin then and continue until all available spots are filled. It is the applicant's responsibility to make sure all documents are sent on time. If you have any questions, please contact us at [MSc.OccScience@dal.ca](mailto:MSc.OccScience@dal.ca)

## **Scholarship Support, Awards, Bursaries**

Students who are seeking scholarship support for the thesis-based program are encouraged to explore funding opportunities through the Faculty of Graduate Studies. Please refer to [Funding Opportunities - Faculty of Graduate Studies - Dalhousie University](#) for more information. Most scholarship applications are due in early December, so applicants are encouraged to apply for scholarships and the program early.

## **Degree Requirements**

### **Thesis Option - total 12 credit hours + thesis**

Core Course (9 credit hours)

OCCU 6510.03: Occupational Science Theory: Doing, Being, Belonging, Becoming

OCCU 6511.03: Research Methods and Literacy

OCCU 6513.03: Putting Knowledge to Use

Elective Courses (3 credit hours) from list below

Thesis

OCCU 9002.00: Thesis

Students are typically expected to enroll in the thesis each term until it is complete. Note that thesis students must complete OCCU 6510.03 and OCCU 6511.03 before defending their thesis proposal.

### **Course-based Option - total 24 credit hours**

(first intake anticipated in 2023/2024)

Core Course (18 credit hours)

OCCU 6510.03: Occupational Science Theory: Doing, Being, Belonging, Becoming



OCCU 6511.03: Research Methods and Literacy

OCCU 6513.03: Putting Knowledge to Use

OCCU 6512.03: Social Inequities in Everyday Life

OCCU 6514.06: Capstone Project: Leadership through Occupation

Elective Courses (6 credit hours) from list below

## Elective Options

OCCU 6512.03: Social Inequities in Everyday Life (for Thesis students only\*)

OCCU 6515.03: Contemporary & Global Issues in the World of Work

OCCU 6516.03: Aging, Inclusion & Participation

OCCU 6517.03: Program Planning & Evaluation

OCCU 6518.03: Identity & Transitions: We Are What We Do

OCCU 6519.03: Assessing Health & Occupational Outcomes

OCCU 6520.03: Community Development: Daily Lives & Collective Doing

OCCU 6521.03: Chronic Conditions in Everyday Life

OCCU 6522.03: Directed Reading Course

OCCU 6523.03, 6524.03, 6525.03, 6526.03: Special Topics  
(courses that will change based on current topics, issues)

Not all electives are offered every year. Please see School of Occupational Therapy website for course offerings each year.

\*an elective for Thesis students only as it is required for course-based option

## Sample Timeline for Full-time Thesis Student

Full-time	Fall	Winter	Spring
Year 1	OCCU 6510 Elective-option 1 OCCU 9002	OCCU 6511 OCCU 6513 OCCU 9002	OCCU 9002 Elective option 2
Year 2	OCCU 9002	OCCU 9002	OCCU 9002

## Sample Timeline for Part-time Thesis Student

Part-time	Fall	Winter	Spring
Year 1	OCCU 6510	OCCU 6511	Elective option 1
Year 2	OCCU 9002 (Thesis) Elective option 2	OCCU 6513	OCCU 9002

## Program Information

### Residency, Orientation, Committee members

All full-time and part-time MSc (OS) students are required to participate in an online orientation period of up to two weeks. There is no required on-site residency for this program, although some thesis supervisors may request residency, when appropriate. The orientation schedule includes an introduction to the program and faculty, the library and technology. Each thesis student is encouraged to identify potential Faculty Supervisor(s) in their application. The proposed supervisor will accept them as their student or in some circumstances, the admission team will propose new faculty to take the role of supervisor. A thesis supervisor will typically be confirmed upon admission into the program, with all thesis supervisors confirmed within the first term of the program. A thesis committee will be formed in compliance with FGS regulations.

### Full-Time and Part-Time Study

The MSc (OS) program is available on a full time or part time basis, with preference given to full-time students.

### Length of Program

Full-time: Approximately 1.5-2 years.

Part-time: Approximately 4 years.

Part-time students may enroll in up to 6 credit hours per term and must be registered in at least one course each term unless on an approved leave of absence. See FGS regulations regarding maximum time allowed to complete.

### Program fees

It is anticipated that full-time students will pay the 1-year program fee in the first year while taking courses and then pay continuing fees in the second year while completing their thesis or remaining courses.

Part-time students are required to pay the equivalent full-time program fee over 9 terms after which they will transition to continuing fees. Part time students who complete their requirements early will be required to cover any remaining balance.

See money matters for details about fees and payment schedules: [https://www.dal.ca/admissions/money\\_matters.html](https://www.dal.ca/admissions/money_matters.html).

### Distance cost

Students pay a Distance Fee per course to cover, administration, and related expenses. Additional student expenses include: textbooks, long distance telephone and fax costs, photocopy costs for library materials, access to the Internet and other technology or software. Depending on a student's thesis research, statistical or qualitative analysis software and bibliographic software may be required.

### Transfer credits

Typically transfer credits are not accepted for this program, however up to one relevant transfer credit elective may be considered on a case- by-case basis.

## Dalhousie Letters of Permission

Students are not permitted to complete any credit hours outside Dalhousie.

# Master of Science (Occupational Therapy–Post-Professional) (MSc OT)

**Admission into the MSc Occupational Therapy Post Professional Program is suspended effective January 2019.**

## Introduction

The School of Occupational Therapy opened a post-professional Master of Science program in occupational therapy in 1998. Admitting qualified occupational therapists from national and international locales, this is an innovative, part-time, or full-time on-line distance education, 30 credit hours Master's program with course work (non-thesis) or thesis options. Students require regular and consistent access to the internet to participate successfully in this online distance education program.

1. Full MSc (OT–Post-Professional) Program: 30 credit hours full- or part-time study online
  - a) Research Thesis Stream: Two required courses, two electives and a thesis
  - b) Practice Leaders Stream: Five required courses, including a practicum and four electives
2. Single courses: with Post Professional Graduate Program Coordinator and Instructor permission, see [Regulation 5.7](#)

## MSc (Occupational Therapy—Post-Professional) Program

***Post Professional Courses (selection for Practice Leaders or Research Thesis Streams). Please note that not all courses are offered every year.***

- OCCU 5010.03: Advanced Studies on Enabling Occupation
- OCCU 5020X/Y.06: Graduate Seminar and Practicum
- OCCU 5030.03: Advanced Research Theory and Methods for Occupational Therapists
- OCCU 5040.03: Identity and Transitions
- OCCU 5041.03: Evidence-Based Occupational Therapy
- OCCU 5042.03: Community Development for Occupational Therapists
- OCCU 5043.03: Program Evaluation for Occupational Therapists
- OCCU 5050.03: Public Dialogue on Occupations and Enablement
- OCCU 5501.03/OCCU 5502.03/OCCU 5503.03/OCCU 5504.03: Graduate Reading
- OCCU 6501.03: Special Topics in Health, Health Care, and Social Services
- OCCU 6502.03: Special Topics: Advanced Data Analysis
- OCCU 6503.03: Advancing Vocational Rehabilitation Through Critical Occupational Analysis
- OCCU 6504.03: Measuring Health Outcomes
- OCCU 6506.03: Practice Management of Occupational Therapy
- OCCU 6507.03: Critical Perspectives on Inequities
- OCCU 6508.03: Chronic Condition Management
- OCCU 6509.03: Aging and Continuing Care
- OCCU 9001.18: Thesis

## ***Practice Leaders Stream (Coursework)***

The Practice Leaders Stream is designed for clinicians and managers and emphasizes leadership in enabling occupation in any area of practice. Students may complete the degree in 10 months full-time study or part-time up to five years. Elective options should be confirmed each year with the School. Students with specific clinical management or other interests are encouraged to consult with the School about options. Please note that not all courses are offered every year.

**Students complete five required courses (18 credit hours):**

- OCCU 5010.03: Advanced Studies on Enabling Occupation
- OCCU 5020 X/Y.06: Graduate Seminar and Practicum
- OCCU 5041.03: Evidence-Based Occupational Therapy
- OCCU 5043.03: Program Evaluation for Occupational Therapists
- OCCU 5050.03: Public Dialogue on Occupations and Enablement

**Students select four elective courses (12 credit hours):**

- OCCU 5030.03: Advanced Research Theory and Methods for Occupational Therapists
- OCCU 5040.03: Identity and Transitions
- OCCU 5042.03: Community Development for Occupational Therapists
- OCCU 5501.03: Graduate Reading
- OCCU 6501.03: Special Topics in Health, Health Care, and Social Services
- OCCU 6502.03: Special Topics: Advanced Data Analysis
- OCCU 6503.03: Advancing Vocational Rehabilitation Through Critical Occupational Analysis
- OCCU 6504.03: Measuring Health Outcomes
- OCCU 6506.03: Practice Management for Occupational Therapy
- OCCU 6507.03: Critical Perspectives on Inequities
- OCCU 6508.03: Chronic Condition Management
- OCCU 6509.03: Aging and Continuing Care

**Sample Plan for Part-Time Practice Leaders Stream**

**(Note: Student pays program fee over nine academic terms, continuing theses only fees thereafter) Part time may attend to five years.**

	Fall Term	Winter Term	Spring Term
YEAR 1	OCCU 5010	OCCU 5043	Elective
YEAR 2	OCCU 5020	OCCU 5020	Elective
YEAR 3	OCCU 5041	OCCU 5050	Elective
	OCCU 5042		

***Research Thesis Stream***

Students registered in the Research Thesis Stream complete a minimum of 30 credit hours including OCCU 5010: Advanced Studies on Enabling Occupation (3 credit hours), OCCU 5030: Advanced Research Theory and Methods for Occupational Therapists (3 credit hours), two elective courses (3 credit hours), and a thesis (18 credit hours). Thesis students must complete OCCU 5010 and OCCU 5030 before defending their thesis proposal.

**Sample Plan for Full-Time Research Thesis Stream**

**(Note: Student pays program fee for one academic year; continuing fees thereafter). Students studying full time may complete courses and a thesis proposal in one year. Thesis completion time will depend on the study and student/research circumstances.**

Fall term	Winter Term	Spring Term
OCCU 5010	OCCU 5030	OCCU 9001
Elective	Elective	
OCCU 9001	OCCU 9001	

**Sample Plan for Part-Time Research Stream (three years)**

**(Note: Student pays program fee over nine academic terms; thesis only fees thereafter). |**

**Part time may attend to five years.**

	Fall Term	Winter Term	Spring Term
YEAR 1	OCCU 5010	OCCU 5030	Elective
YEAR 2	Elective	OCCU 9001	OCCU 9001
YEAR 3	OCCU 9001	OCCU 9001	OCCU 9001

### ***Program Information***

#### **Residency, Orientation, Additional Courses, Advisors (Degree students, not single course students)**

All full-time and part-time MSc (OT–Post-Professional) students in both Practice Leaders and Research Thesis Streams are required to participate in an online orientation period of up to two weeks. The schedule includes an orientation to the program, library and technology. Each student is assigned a Faculty Advisor upon their admission to the program.

Students wishing to spend time on campus at any time throughout their program are encouraged to use library and other university and School facilities. Students are also welcome to complete part or all of their program on-site. Students determine their own schedule in consultation with their Faculty Advisor. Faculty Advisors may or may not become the student’s Thesis Supervisor.

For students in the Research Thesis Stream, negotiations between a student and Thesis Supervisor may result in a student being required to complete an additional three credit hours in research methods or elective courses, as available and accessible with appropriate permission.

#### ***Full-Time and Part-Time Study***

The MSc (OT–Post-Professional) program is available to Research Thesis students on a full time or part time basis. The Practice Leader Stream is available on a part-time basis only. Full-time students may enroll in up to 30 credit hours per year. Part-time students may enroll in up to 15 credit hours in any one academic year. Students are advised to enroll first in OCCU 5010.03: Advanced Studies on Enabling Occupation. The normal upper time limits are four years for full time and five years for part time study. Extensions may be granted in special cases upon petition to the Faculty of Graduate Studies

#### ***Distance Costs***

Students pay a Distance Fee per course to cover mailings, limited long distance phone costs, administration, and related expenses. Additional student expenses include: textbooks, long distance telephone and fax costs, photocopy costs for library materials, access to the Internet and other technology or software. Depending on a student’s thesis research, statistical or qualitative analysis software and bibliographic software may be required.

#### **Transfer Credits**

Occupational therapists with partial graduate level education in another field or at another university may submit a request to transfer credits to this program if the credits have not been used toward another degree. A maximum of six credit hours with a grade of B- or above may be transferred, on individual review of transcripts and full course descriptions by the Post Professional Program Coordinator. All transfers are subject to approval by the Faculty of Graduate Studies.

#### **Dalhousie Letters of Permission**

Students may complete up to six credit hours of the MSc (OT–Post-Professional) program outside Dalhousie under Letters of Permission from the Graduate Program Coordinator. Requests, including a detailed course outline, must be submitted prior to the student enrolling in the course. A grade of B- or higher is required for these courses to be credited towards the student’s MSc (OT–Post-Professional) degree. Enrollment at Dalhousie enables students to complete courses by Letter of Permission at Canadian Atlantic universities without additional fees. Additional fees are normally required by other universities.

#### **Awards, Scholarships, Bursaries**

Refer to [www.dalgrad.dal.ca/funding](http://www.dalgrad.dal.ca/funding) for information regarding awards, scholarships, and bursaries for the MSc (OT–Post-Professional) program.

#### **Special Student - Graduate Studies (SSGS) (No-Degree, For Course Specific Admission)**

Occupational therapists who meet Faculty of Graduate Studies criteria, and who have permission of the School Post-Professional Program Coordinator may enroll in a maximum of six credit hours offered within the MSc (OT– Post-Professional) program.

Normally, courses completed under SSGS status cannot be used for credits towards formal graduate programs. However,

occupational therapists who complete courses under SSGS status can at the time of their application to the MSc (OT– Post-Professional) program, apply to receive transfer credit for up to two SSGS courses (one full credit total). Final approval must be granted by the Post-Professional Graduate Program Coordinator and the Faculty of Graduate Studies. (see [Regulation 5.7.7](#))

NOTE: The fees paid as an SSGS do not count towards the program fee paid by a student admitted to the MSc (OT– Post-Professional) program.

## Doctor of Philosophy (PhD)

Faculty in the School of Occupational Therapy welcome inquiries for PhD studies focused on occupational therapy or occupational science. Interested persons are encouraged to contact individual faculty member(s). Applications will be submitted through the most suitable program, such as the PhD program in Health, Interdisciplinary PhD program, or Biomedical Engineering. Prospective students may be eligible for funding through scholarship programs at NSERC, SSHRC, CIHR, the Nova Scotia Health Research Foundation (NSHRF), or the Nova Scotia Graduate Scholarship program (NSGS). Within Dalhousie funding possibilities include Killam scholarships.

## Graduate Certificate Programs

**Admissions into the Graduate Certificate Programs below have been suspended.**

**Graduate certificates are offered in three topic areas:**

- Chronic Condition Self-Management
- Aging and Continuing Care
- Diversity and Inclusion

These certificates are for people who are working in health, social, or community services whose professional preparation has normally included a bachelor's degree or higher in a relevant field.

**Chronic Condition Self-Management** is an approach currently being adapted across settings, jurisdictions, and disciplines in Canada and beyond to help people with chronic conditions such as diabetes, cardiopulmonary disease, mental illness, and/or neurological conditions such as MS manage their health and everyday life.

**Aging and Continuing Care** is an increasingly important topic in health, social and community services due to the aging of our population.

**Diversity and Inclusion** has been identified as an important area for health, social and educational services in order to meet the needs of vulnerable groups in an increasingly diverse Canadian population.

These certificates are for people who are working in health, social, or community services whose professional preparation has normally included a bachelor's degree or greater in a relevant field. These fully online certificates are suitable for students who are interested in advanced study but do not necessarily want to complete a full post-professional Master's degree. Each certificate consists of three three-credit courses: one required course in the topic area, and two electives selected by the student. The student completes all assignments for their electives in the topic area of their certificate.

Through completion of a certificate, students will:

1. further develop knowledge and remain abreast of current advances of within a practice-relevant topic area (chronic condition self-management, aging and continuing care, diversity, and inclusion)
2. critically analyze the current knowledge base within a specific topic area
3. learn to apply knowledge in this topic area at a program or systems level through engaging in studies in other relevant areas (through selection of elective courses).

***Tracking and Application for Certificate***

As students complete each elective, they complete and submit a form that demonstrates that they have completed all the course assignments in the subject area of their certificate. The course instructor verifies the form, and a copy is sent to the student for their records. The form is available on the School of Occupational Therapy website.

Once students complete their three courses, they apply for their certificate, which is mailed to them. The application form is on the School of Occupational Therapy website.

## Graduate Certificate Programs

Students complete one of these required courses depending upon which certificate they select:

- OCCU 6507.03: Critical Perspectives on Inequities in Everyday Life (Diversity and Inclusion)
- OCCU 6508.03: Chronic Condition Management
- OCCU 6509.03: Aging and Continuing Care

Following completion of the required courses, students select two elective courses from this list:

- OCCU 5010.03: Advanced Studies on Enabling Occupation
- OCCU 5030.03: Advanced Research Theory and Methods for Occupational Therapists
- OCCU 5040.03: Identity and Transitions
- OCCU 5041.03: Evidence-based Occupational Therapy
- OCCU 5042.03: Community Development for Occupational Therapists
- OCCU 5043.03: Program Evaluation for Occupational Therapists
- OCCU 6504.03: Measuring Health Outcomes

**PLEASE NOTE:** Not all courses are offered every year. Student should contact the School of Occupational Therapy [occupational.therapy@dal.ca](mailto:occupational.therapy@dal.ca) to find out the schedule for course offerings.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

Please refer to specific Occupational Therapy graduate program sections to see the list of courses required to complete the applicable degrees.

## Course Descriptions

### OCCU 5000 Theories of Occupation, Enabling & Justice

CREDIT HOURS: 3

This course explores and analyzes the theories, practice models and frames of reference that are foundational to the occupational therapist's view of occupation, participation, occupational performance, enabling occupation, and occupational justice. Consistent with the School's educational philosophy of experiential learning, the class format includes but is not limited to small and large group discussions, case scenarios, presentations, labs, and written assignments. Students are expected to engage in creative problem solving and critical and reflective analysis when completing assignments and participating in class and laboratory discussions. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Admission to the MSc (OT) program, or SSGS (Special Student Graduate Studies) status by permission of the instructor

FORMATS: Lecture | Lab

### **OCCU 5003 Dimensions of Professional Practice**

CREDIT HOURS: 3

This course is designed to prepare students for professional practice. Emphasis is placed on the importance of professional behaviours, ethical and legal issues that arise in the healthcare context, and professional reasoning required to begin professional practice in fieldwork experiences. Through a variety of experiences and with a professional perspective, students will expand their current knowledge about occupation, and integrate theory and knowledge from co-requisite and prerequisite courses to issues that are representative of current occupational therapy practice. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Admission to the MSc (OT) program, or SSGS (Special Student Graduate Studies) status by permission of the instructor.

### **OCCU 5004 Occupational Assessment and Occupational Analysis**

CREDIT HOURS: 3

Students will (a) explore fundamental concepts, processes and strategies to assess and analyze a client's occupational performance and engagement; (b) learn to select, conduct, and interpret formal and informal assessment approaches when evaluating the person, environment, occupation fit; and (c) critically review how assessment methods are employed to elicit a comprehensive understanding of the client's occupational needs.

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor.

### **OCCU 5006 Wellness and Inclusion by Design and Technology**

CREDIT HOURS: 3

In this course students learn the principles and best-practice application of environmental design and technology to enable occupational well-being, participation, and inclusion in the public and personal sectors. Through practical projects in environmental design, technology and community development, and application in laboratory sessions, students develop skills in evaluating, designing, and promoting the reachability, usability and accessibility of the built and social environment which has a profound effect on the choice and opportunities we have in engaging in meaningful occupations in everyday life. TECHNOLOGY & SOFTWARE: Consult <http://www.dal.ca/ilo> for current technology requirements.

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

### **OCCU 5010 Advanced Studies on Enabling Occupation**

CREDIT HOURS: 3

This 12-week course will facilitate advanced critique on research and theories on occupation, and on processes on enabling change in individuals, environments and systems. Drawing on empirical, interpretive, and critical social sciences, students will explore the key issues and literature relating to occupation and occupational therapy, particularly focusing on the three areas of concentration for the post-professional MSc program: Foundations, Evaluation, and Systems Organization. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements.

PREREQUISITES: Qualified Occupational Therapists and permission by instructor

### **OCCU 5011 Enabling Occupation 1: Mental Health**

CREDIT HOURS: 5

This course introduces students to the occupational therapy process of practice used in relation to the personal and environmental factors of individuals who are experiencing mental health problems. Classroom sessions will focus on learning the background knowledge required, while skill development laboratory sessions will focus on the development of practice skills such as establishing the therapeutic relationship, identifying person and environmental factors affecting occupational performance and engagement, and determining appropriate occupational therapy intervention approaches. Integration seminars will be conducted to make connections between content from all courses explicit and to clearly indicate to students how content relates to the acquisition of competencies for the profession. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Admission to the MSc(OT) program, or previously approved special student status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor.

RESTRICTIONS: Admission to the MSc(OT) program

EXCLUSIONS: OCCU 5001

FORMATS: Lecture

### **OCCU 5012 Health Conditions, Pharmacological Management and their Effect on Occupational Performance**

CREDIT HOURS: 4

This course examines the relationship between medically defined health conditions and occupational engagement and performance across the lifespan. Students will be able to describe health conditions and analyze their impact on occupations in daily life. The knowledge base developed will be in the etiology, medical classification and diagnosis, symptoms, treatment, and prognosis of common mental and physical conditions, and how they affect body function and structure and performance of daily occupations. Knowledge about conditions drawn from various medical specialties will be synthesized with occupation-specific knowledge. Relevant information on how contemporary drug therapies for various health conditions can affect clients receiving



occupational therapy will be covered. Students will be expected to engage in self-directed inquiry and consider the cultural construction of health conditions. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements  
PREREQUISITES: Admission to the MSc(OT) program, or previously approved special student status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor.  
RESTRICTIONS: Admission to the MSc(OT) program  
EXCLUSIONS: OCCU 5002 and OCCU 6130  
FORMATS: Lecture

### **OCCU 5015 Enabling Occupation 2: Musculoskeletal Therapeutics**

CREDIT HOURS: 5

This class builds on the knowledge and skills acquired in Year 1, Fall term, by introducing students to the biomechanical aspects of occupational engagement and performance. The focus of the course will be on occupational therapy processes of practice (e.g., assessment, intervention, documentation) with clients experiencing occupational engagement and performance issues that are related to musculoskeletal impairments.

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

EXCLUSIONS: OCCU 5005

FORMATS: Lecture

### **OCCU 5017 Research Approaches and Evidence-based Practice for Occupational Therapists**

CREDIT HOURS: 4

This course introduces students to quantitative and qualitative research paradigms, as well as broad considerations for legitimate sources of evidence for occupational therapy practice. Entry-to-practice occupational therapists are expected to be astute consumers of research and understand the implications of research findings and evidence as it relates to clients' occupational performance and clinical practice. This course will expose students to frequently used research methods, study designs and sampling considerations. Students will be expected to demonstrate critical appraisal skills, integration of research and evidence findings and how these can influence clinical decision making. Students will also be exposed to knowledge translation principles and practices, as well as strategies for implementation of knowledge translation in daily practice. This course prepares students for the OCCU 6000 Applied Research course.

TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

RESTRICTIONS: Admission to the MSc(OT) program

EXCLUSIONS: OCCU 5007 and OCCU 5041

FORMATS: Lecture

### **OCCU 5030 Advanced Research Theory and Methods for Occupational Therapists**

CREDIT HOURS: 3

This 12-week online course provides an introduction to the theory and epistemology underlying qualitative and quantitative research methods. It then focuses on the development and application of these approaches to develop proficiency in designing a research proposal, giving particular attention to epistemology, methodology, and ethical considerations. TECHNOLOGY & SOFTWARE: Consult <http://www.dal.ca/ilo> for current technology requirements. Other software may be required at the discretion of the instructor.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

### **OCCU 5040 Identity and Transitions**

CREDIT HOURS: 3

This 7-week online course explores mechanisms and theories of identity construction with particular focus on transitions resulting from life circumstances or other factors. During the course students will reflect on how multiple aspects of identity inform each other, examining self-perception in the context of transitions. TECHNOLOGY & SOFTWARE: Consult <http://www.dal.ca/ilo> for current technology requirements.

PREREQUISITES: Open to graduate students and Special Students-Graduate Studies in any field by permission of the instructor

### **OCCU 5041 Evidence-Based Occupational Therapy**

CREDIT HOURS: 3

This course covers key issues in the Master of Science (Occupational Therapy – Post Professional) program. The course provides students with the opportunity to examine and critique evidence-based practice and its application to occupational therapy. Using readings, exercises, and discussion, students analyze the principles underlying evidence-based practice, learn methods to critically appraise the literature, and integrate these methods into occupational therapy practice. The Master of Science (Occupational Therapy – Post Professional) course is a 12-week online course. TECHNOLOGY & SOFTWARE: Consult <http://www.dal.ca/ilo> for current technology requirements.

PREREQUISITES: Admission to the MSc (OT) or MSc (OT–Post-Professional) program. Other Graduate Students or SSGS (Special Student Graduate Studies)

status by permission of the instructor. Students enrolled in the MSc (OT) program must have successfully completed all program courses in the previous semester.

### **OCCU 5042 Community Development for Occupational Therapists**

CREDIT HOURS: 3

This 7-week online course focuses on community development as a distinct domain of practice. The course uses a community-focused experiential learning process to enable participants to understand their own communities and professional behaviours in relation to community development. Readings and assignments are used to encourage experience, reflection, and personal integration. TECHNOLOGY & SOFTWARE: Consult <http://www.dal.ca/ilo> for current technology requirements.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor

### **OCCU 5043 Program Evaluation for Occupational Therapists**

CREDIT HOURS: 3

This is a required course in the Masters of Science (Occupational Therapy) program AND the Practice Leader Stream of the Masters of Science (Occupational Therapy – Post Professional) program. Post-Professional students enroll in the on-line only section. The course develops knowledge and skills in program evaluation through critical appraisal of key issues and challenges facing occupational therapy practitioners. The course provides an overview of the key phases and issues in program evaluation. TECHNOLOGY & SOFTWARE: Consult <http://www.dal.ca/ilo> for current technologies.

PREREQUISITES: Admission to the MSc (OT) or MSc (OT–Post-Professional) program, or SSGS(Special Student Graduate Studies) status by permission of the instructor. Students enrolled in the MSc(OT) program must have successfully completed all program courses in the previous semester.

### **OCCU 5050 Public Dialogue on Occupations and Enablement**

CREDIT HOURS: 3

This online course examines how to communicate and disseminate scholarly and professional work to audiences in various contexts. Students critically reflect on current knowledge translation frameworks to develop communication strategies and products such as public presentations and publishable manuscripts they can present to targeted audiences in their respective fields. TECHNOLOGY & SOFTWARE: Consult <http://www.dal.ca/ilo> for current technology requirements.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor

### **OCCU 5112 Fieldwork I**

CREDIT HOURS: 3

The students gain firsthand experience of the personal and environmental factors that influence occupational development, participation, and engagement of individuals/groups in this first part-time, community-based fieldwork learning experience. Students participate in community programs and reflect in small group tutorials with licensed occupational therapists to link their fieldwork experiences to their growing professional knowledge. Course learning objectives, integrated with learning opportunities available at community organizations, provide structure for developing the core professional skills of professional behaviors/responsibilities and communication. Students also have the opportunity to learn observation skills, professional/clinical reasoning, peer learning and feedback, self-directed learning, and collaboration skills. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

EXCLUSIONS: OCCU 5111

FORMATS: Lecture

### **OCCU 5222 Fieldwork II (337.5 hr) (May – June)**

CREDIT HOURS: 6

Students focus on the broad scope of occupational therapy practice in mental and physical health settings. There is a focus on rural health in this course. Students develop a clear professional identity and learn to describe and justify their professional reasoning through the full process of occupational therapy practice. Occupational therapist preceptors provide supervision, direct, concrete feedback, and frequent coaching sessions. TECHNOLOGY: Access to internet and e-mail is strongly recommended during fieldwork courses.

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

### **OCCU 5501 Graduate Reading**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to OCCU 5502/OCCU 5503/OCCU 5504.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor

### **OCCU 5502 Graduate Reading**

CREDIT HOURS: 3

See OCCU 5501.

### **OCCU 5503 Graduate Reading**

CREDIT HOURS: 3

See OCCU 5501.

### **OCCU 5504 Graduate Reading**

CREDIT HOURS: 4

See OCCU 5501.

### **OCCU 6001 Enabling Occupation III: Neurotherapeutics**

CREDIT HOURS: 5

This course will build upon the practice knowledge and skills developed in Enabling 1 and Enabling 2 by introducing the student to the neurological and cognitive aspects of occupational performance across the lifespan. Focus will be on occupational therapy processes of practice with clients experiencing complex occupational performance issues.

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

### **OCCU 6002 Social Influences on Occupational Performance**

CREDIT HOURS: 3

This course explores the ways occupational meaning, engagement and performance are shaped by 'social location' - the experiences, values, assumptions, expectations that arise out of such factors as our race, class, gender, sexual orientation, culture, age, ability/disability. We explore how these factors affect therapy and occupation for both clients and therapists. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

### **OCCU 6006 Applied Research for Occupational Therapists**

CREDIT HOURS: 3

This is the major project course for the entry-level Master of Science (Occupational Therapy) program. You will choose from possible topics presented by faculty members, or identify your own topic related to occupation or occupational therapy. Guided by the course instructor and a faculty content supervisor you will conduct an in-depth analysis of evidence on your topic. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

RESTRICTIONS: Acceptance into the MSc(OT) program

EXCLUSIONS: OCCU 6000 and OCCU 6600

FORMATS: Lecture

### **OCCU 6013 Advanced Practice Issues**

CREDIT HOURS: 4

This course builds skills in critical analysis, evidence-based professional reasoning, presentation, and synthesis of previous knowledge into current practice. Using current issues in health and occupational therapy practice, the required exercises of reflecting, reasoning, determining a personal perspective and developing a plan of action strengthens current and life-long learning patterns. Integration seminars will be used to support the acquisition of these outcomes. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

EXCLUSIONS: OCCU 6003

FORMATS: Seminar

### **OCCU 6111 Fieldwork III**

CREDIT HOURS: 6

Students focus on developing competence and confidence in the full process of practice with clients experiencing complex occupational performance issues. Occupational therapist preceptors provide periodic or occasional coaching. The course consists of eight weeks of full-time fieldwork learning in Canada or internationally, or with an off-site occupational therapist preceptor in Atlantic Canada, following orientation in the academic setting.

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

### **OCCU 6140 Neuroscience for Occupational Therapy**

CREDIT HOURS: 6

This course provides students with the foundational neuroscience knowledge and application of human neuroanatomy and neurophysiology concepts for occupational therapy practice. Emphasis will be placed on functional neuroscience of brain systems experiencing common neurological challenges, and involves work in microanatomy, gross anatomy, and neurophysiology of the brain and spinal cord.

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

### **OCCU 6222 Fieldwork IV**

CREDIT HOURS: 6

The course consists of eight weeks of full-time fieldwork learning in Canada or internationally, or with an off-site occupational therapist preceptor in Atlantic Canada, following orientation in the academic setting. During this final fieldwork learning experience students focus on consolidating and refining core competencies, reflecting on practice, and seeking new challenges with minimal guidance from preceptors. Students become independent in working with individual, group and organizational clients. By completion of this course, they demonstrate clinical confidence and consistency in making sound professional decisions and judgments in preparation for entering professional practice.

PREREQUISITES: Successful completion of all MSc(OT) program courses in the previous semester, previously approved Special Student - Graduate Studies (SSGS) status from the School of Occupational Therapy and the Faculty of Graduate Studies, or by permission of instructor

### **OCCU 6501 Special Topics in Health, Healthcare, and Social Services**

CREDIT HOURS: 3

This on-line seminar course is an intensive examination of a selected substantive issue in health, well-being, healthcare, and social services. Particular attention is given to practice, policy, economic and/or sociocultural issues that arise in diverse contexts. The specific topic differs from year to year, consult the School prior to registration. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor

### **OCCU 6502 Special Topics: Advance Data Analysis**

CREDIT HOURS: 3

This online course focuses on the theories, techniques, and issues of data analysis. It is aimed at graduate students who are ready to begin data analysis. Having data to use in the course is preferable, but not necessary. The focus on qualitative, quantitative, or mixed methods analysis varies by year.

TECHNOLOGY & SOFTWARE: Consult <http://www.dal.ca/ilo> for current technology requirements. Other software may be required at the discretion of the instructor.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor

### **OCCU 6503 Advancing Vocational Rehabilitation Through Critical Occupational Analysis**

CREDIT HOURS: 3

This online course develops the skills to apply and critically analyze the practice of vocational rehabilitation. Students will utilize their knowledge of enabling occupations to critique the current vocational rehabilitation processes presented in the literature. The outcome will be advanced knowledge to develop a client-centered, interdisciplinary practice in the field. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor.

### **OCCU 6504 Measuring Health Outcomes**

CREDIT HOURS: 3

This 7-week online course provides students with the opportunity to: (a) understand how outcome tools are developed; (b) determine if tools generate accurate, consistent, and meaningful measures; and (c) appreciate how tools are constructed to generate reliable, valid, and sensitive measures. A comfort with reading and assessing statistics is helpful. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements  
PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor

### **OCCU 6506 Practice Management for Occupational Therapy**

CREDIT HOURS: 3

Exceptional leadership and management capabilities are required by occupational therapy practice leaders. This course will prepare students to identify and reflect on issues, as well as problem solve potential solutions to practice management challenges.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor

### **OCCU 6507 Critical Perspectives on Inequities**

CREDIT HOURS: 3

This 12-week online course examines social inequities in what people do every day to occupy life, including work, leisure, health services utilization and schooling. Using an occupational science lens, and critically examining issues of diversity, this course examines the implications of everyday inequities for health and well-being. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor

### **OCCU 6508 Chronic Condition Management**

CREDIT HOURS: 3

This 12-week online course consists of an examination of substantive issues of concern related to chronic condition management. In this course students will critically analyze a range of issues including: contexts for care; models of chronic care; practice-based approaches; tools and intervention strategies; quality and safety; and organizational change TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Open to graduate students and special student -Graduate Studies, Students by permission of the instructor.

### **OCCU 6509 Aging and Continuing Care**

CREDIT HOURS: 3

This 12-week online course focuses on older adults, their inclusion and participation in occupations (that is, the things they want to do, need to do, and are expected to do), and the continuing care policies and services that support their everyday lives. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: Open to graduate students and special student -Graduate Studies, Students by permission of the instructor.

### **OCCU 6510 Occupational Science Theory: Doing, Being, Belonging, Becoming**

CREDIT HOURS: 3

This is a foundational course in occupational science that critically examines current theoretical and conceptual models in occupational science and the evidence supporting human occupation. Course content will explore and critique contemporary theoretical models and the various theoretical constructs that have evolved within the occupational science literature and related interdisciplinary fields that inform occupational science. This course will provide students with the opportunity to examine humans as occupational beings, the relationship between occupation and health and well-being, as well as consider how occupational science theories, models and constructs may be used to address contemporary health and social issues. This course will encourage students to apply occupational science theories, models, and constructs to explain contemporary health and social issues facing society as well as to develop new insights and potential solutions to address them.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor

FORMATS: Online Delivery

### **OCCU 6511 Research Methods and Literacy**

CREDIT HOURS: 3

This course provides an introduction to theories and epistemologies underpinning qualitative and quantitative research methods, distinguishing between naturalistic and experimental approaches used to study human occupation. Goals of the course are to be able to apply knowledge to appraising the research literature and to developing proficiency in designing and pursuing research projects. Please note that while you may use the research proposal you develop in this course as a basis for developing a research proposal for your graduate degree or professional environment, assignments for this course must satisfy the requirements of this course and may not be completely transferrable to other contexts.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

### **OCCU 6512 Social Inequities in Everyday Life**

CREDIT HOURS: 3

This course aims to introduce students to empirical evidence and theoretical arguments concerning social inequities in everyday life and occupations, as well as implications for health and well-being. In occupational science, 'occupation' refers not to jobs but to all meaningful activities with which people occupy themselves, including work and education, care for self and others, leisure, and activities through which people connect with themselves and each other.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6513 Putting Knowledge to Use**

CREDIT HOURS: 3

The course examines the best ways to move research findings forward to affect practice, policy, and action. Examining 'knowledge translation' and 'implementation science' frameworks, we will interrogate how to get occupational science evidence taken up by people and organizations that can put it to practical use. Students will prepare a knowledge translation portfolio based on their expertise from course assignments and projects.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6514 Capstone Project: Leadership through Occupation**

CREDIT HOURS: 6

This course will be held over 3-4 terms. In the Occupational Science Program, graduate students have gained theoretical knowledge; critically examined intersecting occupational contexts and tensions between individuals, groups, communities, and society; and related them to living as occupational beings. In this course, students will identify a defined cluster of these complexities for their Major Project and will experience the context and tensions firsthand by engaging with, and taking leadership in, making an occupational change in a chosen organization/system. Students will further deepen and solidify their appreciation and understanding of occupational science through this experience. Drawing on occupational science theories, change theories, leadership and critical themes, students will create a plan that allows them to take leadership in making an occupational change at the level of services, systems, and/or policies. Once students start this course, they are expected to enroll in this course each term during which time they will receive a grade of "In Progress" (IP). A final grade will only be assigned in the last term when course requirements are completed.

PREREQUISITES: Only available for those students enrolled in the Occupational Science Program

FORMATS: Online Delivery

### **OCCU 6515 Contemporary and Global Issues in the World of Work**

CREDIT HOURS: 3

This course provides a critical examination of current work, vocational rehabilitation and work disability literature using occupational science theories and key constructs. Students will examine current readings in the field of using occupational constructs, such as occupational balance, transition, justice, and identity. With a backdrop of neoliberal advanced capitalism and global capitalism, the course will explore the meanings of work, transitions into and out of paid work, and relationships between paid work and identities. This course will encourage students to reconsider previously held beliefs about work, to apply an occupational science lens to answer long-standing questions/problems in the field of work, and to develop new insights and solutions to contemporary work issues facing society.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6516 Aging Inclusion and Participation**

CREDIT HOURS: 3

This course provides an intensive examination of selected substantive issues related to older adults, their inclusion and participation in occupations (that is, the things they want to do, need to do, and are expected to do), and the policies and resources that support their occupational lives. Students will critically explore a range of issues including theoretical approaches to aging; demographics of aging; biological, psychological and social aspects of aging; healthcare policies and strategies related to participation, social inclusion, housing, transportation, pensions and financial issues; family caregiving; and death and dying.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6517 Program Planning and Evaluation**

CREDIT HOURS: 3

This course is aimed at developing knowledge and skills relative to program evaluation and critically appraising key issues and challenges with respect to program evaluation. The course provides an overview of the key phases in program evaluation, including program planning and design, drawing on program evaluation literature, as well as occupational sciences literature. A series of assignments will take students through the various stages and types of evaluation, ending with the development of a major program evaluation project in areas of interest.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor

FORMATS: Online Delivery

### **OCCU 6518 Identity & Transitions: We Are What We Do?**

CREDIT HOURS: 3

Who are we, and how do we know who we are? How and when does our sense of self develop and through what processes? How are identities formed through what we do in our daily lives? What happens to identities at times of transition, such as adolescence, retirement or unemployment, experiences of loss, experience of disability, or the onset of illness? This course explores the mechanisms and theories of identity development and transitions in relation to participation in activities of everyday life. The course focuses on how individual and social identities interact with life transitions, while attending to the influence of social categories, such as culture, race, gender, age, disability, socio-economic status, and sexual orientation.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6519 Assessing Health & Occupational Outcomes**

CREDIT HOURS: 3

This online course provides students with the opportunity to: (a) understand how outcome measures are developed to generate reliable, valid, and sensitive measures; and (b) determine if existing outcome measures generate accurate, consistent, and meaningful data. The focus will be on assessment of the complexity that is occupation – the things people want, need, and are required to do, the things with which people occupy themselves. A comfort with reading and assessing statistics is helpful.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6520 Community Development: Daily Lives and Collective Doing**

CREDIT HOURS: 3

This course explores ways to promote well communities through community development approaches within a health promotion and occupational rights/justice framework. The course uses community-focused experiential learning processes to enable students to understand: their own communities in relation to community development approaches; principles and theories, with a particular focus on the occupations communities engage in to support their wellness; and, how to create positive change.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6521 Chronic Conditions in Everyday Life**

CREDIT HOURS: 3

This course consists of an intensive, cross-disciplinary examination of the empirical literature related to living with a chronic health condition. In this course, students will explore and interrogate a range of issues including: selected chronic conditions across the life span, potential impacts on occupation (what people want and need to do), and the value of interventions such as technology and self-management. The relationship between chronic conditions and occupation will be the primary focus.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6522 Directed Readings in Occupation**

CREDIT HOURS: 3

In this directed reading course, the student works with a full-time, part-time, or an Adjunct faculty of Dalhousie's School of Occupational Therapy, who is

also a member of the Faculty of Graduate Studies. The student and faculty member submit a course syllabus, including course objectives, readings, assignments, and grading criteria for approval by the School's Occupational Science Program Committee. Available in all four terms (Fall, Winter, Spring, and Summer), the goal is for an individual graduate student to design, critique, debate, and synthesize a program of reading on a selected topic or area.  
PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor  
RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field by permission of the instructor  
FORMATS: Online Delivery

### **OCCU 6523 Special Topics**

CREDIT HOURS: 3

This on-line seminar course is an intensive examination of a selected substantive issue that will be critiqued using an occupational science lens. Particular attention is given to practice, policy, economic and/or sociocultural issues that arise in diverse contexts. The specific topic differs from year to year; consult the School prior to registration.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6524 Special Topics**

CREDIT HOURS: 3

This on-line seminar course is an intensive examination of a selected substantive issue that will be critiqued using an occupational science lens. Particular attention is given to practice, policy, economic and/or sociocultural issues that arise in diverse contexts. The specific topic differs from year to year; consult the School prior to registration.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6525 Special Topics**

CREDIT HOURS: 3

This on-line seminar course is an intensive examination of a selected substantive issue that will be critiqued using an occupational science lens. Particular attention is given to practice, policy, economic and/or sociocultural issues that arise in diverse contexts. The specific topic differs from year to year; consult the School prior to registration.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 6526 Special Topics**

CREDIT HOURS: 3

This on-line seminar course is an intensive examination of a selected substantive issue that will be critiqued using an occupational science lens. Particular attention is given to practice, policy, economic and/or sociocultural issues that arise in diverse contexts. The specific topic differs from year to year; consult the School prior to registration.

PREREQUISITES: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

RESTRICTIONS: Open to graduate students and Special Student-Graduate Studies in any field, by permission of instructor.

FORMATS: Online Delivery

### **OCCU 9001 Thesis**

CREDIT HOURS: 18

The thesis requires original research at the master's level. Basic or applied research using qualitative or quantitative methodologies will be conducted as appropriate. Thesis supervision by distance will involve email, telephone, post, teleconference, or other communication as appropriate. TECHNOLOGY: Consult <http://www.dal.ca/ilo> for current technology requirements

PREREQUISITES: MSc(OT-Post-Professional)Research Thesis stream students

RESTRICTIONS: MSc (OT-Post-Professional) Thesis stream students

### **OCCU 9002 Thesis**

CREDIT HOURS: 0

The thesis requires original research at the master's level related to occupation. Basic or applied research may use qualitative or quantitative methodologies



as appropriate. Thesis supervision will be provided by a faculty member associated with the School of Occupational Therapy and a thesis committee, as per Faculty of Graduate Studies Regulations. Thesis Supervision by distance may involve email, telephone, teleconference, videoconference, or other communication as appropriate. As part of the thesis process, the student will develop and defend a thesis proposal, complete ethics applications as appropriate, and complete all steps of the research process. Thesis defense normally occurs via distance and follows Faculty of Graduate Studies Regulations.

RESTRICTIONS: Only available for those students enrolled in the Occupational Science program.

FORMATS: Online Delivery

## Oceanography

Location:

Life Sciences Centre

1355 Oxford Street

3rd Floor

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3557

Fax Number: (902) 494-3877

Email Address: [Oceanography@dal.ca](mailto:Oceanography@dal.ca)

Website: [www.dal.ca/oceanography](http://www.dal.ca/oceanography)

## Staff

### Chair of Department

Hill, P. S.

### Graduate Studies Coordinator

Kienast, M.

### Professors Emeriti

**Bowen, A. J.**, MA (Cantab), PhD (Scripps), FRSC. Physical oceanography, nearshore dynamics, sediment transport

**Lewis, M. R.**, BS, MS (Maryland), PhD (Dalhousie). Biological oceanography, marine ecosystem modelling

### Professors

**Fennel, K.**, MSc, PhD (Rostock), Killam Professor. Biogeochemical Modelling.

**Finkel, Z.V.**, BSc (Manitoba), MSc (Dalhousie), PhD (Rutgers). Canada Research Chair in Marine Microbial Macroecology. Biological oceanography, phytoplankton physiology and ecology, biogeochemical cycles

**Grant, J.**, BSc (Duke), PhD (South Carolina), NSERC - Cooke Industrial Research Chair in Sustainable Aquaculture

**Hay, A.**, BSc, MSc (Western), PhD (UBC). Physical and acoustical oceanography, nearshore and sediment dynamics, turbulence, and tidal energy

**Hill, P. S.**, AB (Dartmouth), MSc, PhD (Wash). Fine sediment transport, particle aggregation

**Kelley, D.**, BSc (Mt. A), PhD (Dalhousie). Ocean mixing and transport processes

**Kienast, M.**, BSc (Clausthal), MSc (Kiel), PhD (UBC). Paleoceanography, sediment biogeochemistry, stable isotope geochemistry

**Kienast, S.**, MSc (Kiel), PhD (UBC). Paleoceanography, marine geochemistry, sedimentology

**MacIntyre, H.**, BA (Cambridge), MA (UT Austin), PhD (Delaware). Phytoplankton viability and productivity, bio-optics

**Metaxas, A.**, BSc (McGill), MSc (UBC), PhD (Dalhousie). Benthic ecology, larval biology, deep-sea biology, marine conservation, marine protected areas

**Sheng, J.**, BEng (East China Technical Univ), MSc, PhD (Memorial). Shelf circulation, ocean modelling, wave-current interaction

**Thomas, H.**, Diplom (Duesseldorf), PhD (Rostock). Chemical oceanography, marine carbon cycles, coastal seas

**Waite, A.**, BSc (Dalhousie), PhD (UBC). Associate Vice-President Research (Ocean) and Scientific Director (Ocean Frontier Institute)

**Wallace, D. W.**, BSc (Univ of East Anglia), PhD (Dalhousie) Climate - biogeochemistry interactions in tropical oceans, International SOLAS programme

### Associate Professors

**Barclay, D.**, BSc (McGill), PhD (Scripps, Univ of California). Acoustical oceanography, ocean instrumentation (Canada Research Chair)  
**Brown, C.**, BSc (Univ Reading), PhD (Univ of Portsmouth). Seafloor habitat mapping, benthic ecology, benthic monitoring, ocean technology

### **Assistant Professors**

**Algar, C. K.**, BSc (Laurentian), PhD (Dalhousie). Sediment biogeochemistry  
**Buchwald, C.**, BSc (MIT), PhD (MIT/WHOI Joint Program), Ocean chemistry (Canada Research Chair). Marine nitrogen cycling, stable isotope biogeochemistry  
**Musgrave, R.**, BSc (Melbourne), PhD (UCSD). Ocean mixing, tides, internal waves  
**Oliver, E.**, BSc (Acadia), MSc (Ottawa), PhD (Dalhousie). Ocean and climate variability, ocean modeling, climate extremes

### **Adjunct (FGS)**

**Azetsu-Scott, K.**, BSc, MSc (Japan), PhD (Dalhousie), BIO  
**Baumgartner, M.**, BSc (Notre Dame), MSc (Southern Mississippi), PhD (Oregon State). Woods Hole Oceanographic Institution  
**Brilliant, S.**, BSc, MSc (UNB), PhD (Univ of Sydney), CWF  
**Dale, A.**, BSc (Birmingham), MSc, PhD (Plymouth), GEOMAR  
**Davies, K.**, BSc (UVic), PhD (Dalhousie), University of New Brunswick (St. John)  
**Devey, C.**, BSc (Univ of London), PhD (Oxford)  
**Devred, E.**, MAPHys (Tulon), PhD (Littoral Cote d'Opale), BIO  
**Dosso, S.**, BSc, MSc (UVic), PhD (UBC)  
**Ellis, D.**, BSc (Mt. A), MSc, PhD (McMaster), Retired  
**Fortin, M.-J.**, BSc, MSc (Montreal), PhD (New York), University of Toronto  
**Gardner, I.**, BVSc (Sydney), MPVM, PhD (California), UPEI  
**Greatbatch, R.**, BSc (Liverpool), PhD (Cambridge), GEOMAR  
**Greenberg, D.**, MMATH (Waterloo), PhD (Liverpool), Research Scientist Emeritus, BIO  
**Jiao, N.**, PhD (Ocean Univ of Qingdao), Xiamen University  
**Johnson, B.**, BEng (North Carolina), PhD (Dalhousie), Pro-Oceanus Systems Inc.  
**Krastel, S.**, PhD (Kiel), Kiel University  
**Lu, Y.**, BEng (Tsinghua), MSc (Qingdao), MSc (Memorial), PhD (UVic), BIO  
**Martin, S. B.**, BSc (Royal Military College), MSc, PhD (Dalhousie), JASCO Applied Sciences  
**Milligan, T.**, BSc, MSc (Dalhousie), Scientist Emeritus, BIO  
**Mosher, D.**, BSc (Acadia), MSc (Memorial), PhD (Dalhousie), University of New Hampshire  
**Oschlies, A.**, MPhil (Cambridge), PhD (Kiel), GEOMAR  
**Perrie, W.**, BSc (Toronto), MSc (California), PhD (Massachusetts Institute of Technology), BIO  
**Piper, D.**, BA, MA, PhD (Cantab), BIO  
**Richards, C.**, BSc (New Brunswick), MSc (Memorial), PhD (Dalhousie), BIO  
**Ritchie, H.**, BSc (Mt. A), BA (Oxford), MSc, PhD (McGill), Environment Canada  
**Ross, T.**, BSc, PhD (Manitoba), Fisheries and Oceans Canada  
**Snelgrove, P.**, BSc (MUN), MSc (McGill), PhD (MIT/WHOI), Memorial University of Newfoundland  
**Tanhua, T.**, MSc, PhD (Göteborg), GEOMAR  
**Vanderlaan, A.**, BSc (Dalhousie), MSc (UVic), PhD (Dalhousie), Fisheries and Oceans Canada  
**Wu, Y.**, BEng (Petroleum Univ of China), MEng, PhD (Tianjin Univ), DFO  
**Zedel, L.**, BSc (UVic), PhD (UBC), Memorial University of Newfoundland

### **Adjunct (Retired)**

**Beaumont, C.**, BSc (Sussex), PhD (Dalhousie)  
**Louden, K.**, BA (Oberlin), MEd (Temple), PhD (MIT)  
**Ruddick, B.**, BSc (Victoria), PhD (MIT)  
**Taggart, C. T.**, BSc (Carleton), MSc (York), PhD (McGill)  
**Thompson, K. R.**, BSc, MSc (Manchester), PhD (Liv)

## **Admission Requirements**

An Honours degree, or its equivalent, is required for admission to the Oceanography Department.

Undergraduate preparation may be in any of the basic sciences - Biology, Chemistry, Physics or Geology. Degrees in Atmospheric Science, Meteorology, Mathematics or Engineering are also acceptable if the undergraduate work includes a reasonably good background in relevant basic science.

## Master of Science (MSc)

For minimum time required to complete this program, see the [Faculty of Graduate Studies Regulation 1.3.1](#) in this calendar.

Students must complete OCEA 5001 and an additional 6 credit hours from core courses (5110.03-5140.03); (unless taken as an undergraduate at 4000-level (4110.03-4140.03) with minimum grade of A or 5000-level as advanced placement).

Additional courses may be required to strengthen a student's background in basic science.

Research and a thesis are required.

## Doctor of Philosophy (PhD)

For minimum time required to complete this program, see the [Faculty of Graduate Studies regulations](#) in this calendar.

Students must complete at least 12 credit hours at 5000-level or higher of OCEA courses (OCEA 5001 does not count towards this requirement), 9 of which from core courses (5110.03-5140.03) (with MSc from Dal Oceanography: core courses taken at MSc can be waived for the PhD requirement; with MSc from other departments or institutions: core course equivalencies will be assessed on case by case). Additional courses may be required to strengthen a student's background in basic science. Candidates are expected to meet an extra qualifying criterion. Consult the Oceanography Graduate Handbook for details.

Candidates must write and defend a proposal for thesis research.

Research and a thesis are required.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### OCEA 5001 Oceanography Graduate Seminar

CREDIT HOURS: 3

This is a mandatory course for all MSc students. It is also available to PhD students, who, however, cannot use it to fulfill the minimum course requirements for their degree. Satisfactory performance in the course components is required throughout the degree program in order for the student to be permitted to register for the course in their final year. The main objectives of the course are to assimilate, evaluate and communicate scientific information in different settings.

FORMATS: Seminar

### OCEA 5004 Oceans and Global Change

CREDIT HOURS: 3

This course examines the role and response of the Oceans to global change, including alterations in currents and circulation, increases in sea level and storm surges, changes in ocean chemistry, modification to the types and patterns of sediment deposition, alterations in the abundances and distributions of organisms, and overall productivity. The course will discuss means of predicting these changes and their effects.

PREREQUISITES: Permission of instructor

EXCLUSIONS: OCEA 4000.03

FORMATS: Lecture

### **OCEA 5110 Geological Oceanography**

CREDIT HOURS: 3

This course provides a broad survey of geology and geophysics as they apply to the oceans. The course content covers methods and observations with quantitative applications to an understanding of marine geophysical and geological processes. The topics covered include the origin of ocean basins, plate tectonics, heat flow, gravity, and magnetism (1/3 of the course); patterns and processes of sediment transport and deposition, and the paleoceanographic reconstruction of past climates (2/3 of the course).

CALENDAR NOTES: No previous background in Geology or Geophysics is required for enrolled graduate students; however, such previous training will enhance student learning. Training in calculus and statistics will also prove to be advantageous.

EXCLUSIONS: OCEA 4110.03, EARTH 4110.03

FORMATS: Lecture

### **OCEA 5120 Physical Oceanography**

CREDIT HOURS: 3

This course introduces graduate students to the physical properties and dynamics of the oceans. Topics range from global circulation down to the small scales of turbulence. Fact and theory are blended throughout. Quantitative problem solving is emphasized in assignments.

CROSSLISTED: OCEA 4120.03

### **OCEA 5130 Chemical Oceanography**

CREDIT HOURS: 3

This course covers the major and minor constituents of sea water, the controls on its chemical composition, nutrient cycling, gas exchange, and the influence of the oceans on atmospheric chemistry. Other topics included are chemical tracers, and radiochemical dating methods, stable isotope studies, chemical speciation and chemical models of sea water.

CROSSLISTED: OCEA 4130.03

### **OCEA 5140 Biological Oceanography**

CREDIT HOURS: 3

The goal is to describe how physical, chemical and biological processes interact to determine the species composition, biogeochemical activities, and trophic structure of marine communities. Outstanding problems currently facing biological oceanographers and earth systems scientists are discussed, as are current attempts and methodologies to address them.

CROSSLISTED: OCEA 4140.03, BIOL 4661.03, 5661.03, MARI 4661.03

### **OCEA 5160 Fisheries Oceanography**

CREDIT HOURS: 3

Oceanographic influences on ecology of marine fish: on population dynamics, distribution, abundance, reproduction, life history, feeding, growth, metabolism, mortality, and recruitment. Emphasis on contemporary hypotheses and primary literature and some on fishery management. Primary-publication-style research paper required. Competence with fundamental population dynamics, ecology, physical oceanography, mathematics, and statistical analyses expected.

CROSSLISTED: BIOL 4369.03, OCEA 4160.03, MARI 4369.03

### **OCEA 5210 Time Series Analysis in Oceanography and Meteorology**

CREDIT HOURS: 3

This course describes the application of advanced time series analysis in oceanography and meteorology. Time and frequency domain approaches are covered. Students will develop their own computer programs to analyze real observations. Specific topics include stationarity, auto and cross covariance functions, power and cross spectra, and state space models.

CROSSLISTED: OCEA 4210.03, STAT 5390.03, STAT 4390.03

### **OCEA 5220 Numerical Modelling of Atmospheres and Oceans**

CREDIT HOURS: 3

This course discusses numerical modelling techniques for simulating atmospheric and oceanic circulations. Material includes: review of governing equations; finite difference, finite element, and spectral methods; Eulerian, semi-implicit and semi-Lagrangian time integration techniques; accuracy and stability analyses; data assimilation and ensemble prediction methods; and boundary treatment for ocean models.

CROSSLISTED: OCEA 4220.03

### **OCEA 5221 Ocean Dynamics**

CREDIT HOURS: 3

An advanced course for students in Physical Oceanography and Atmospheric Science that studies the basic equations governing rotating geophysical flows, plus applications. Topics include geostrophy, conservation of potential vorticity, quasi-geostrophic dynamics, geostrophic adjustment, response to surface forcing (steady and unsteady).

CROSSLISTED: OCEA 4221.03

### **OCEA 5222 Estuary, Coast and Shelf Dynamics**

CREDIT HOURS: 3

An advanced course in the physical processes operative on the continental shelf. Topics include long waves, tides, tidal mixing, thermohaline circulation, wind forcing, upwelling, etc.

CROSSLISTED: OCEA 4222.03

### **OCEA 5223 Ocean Waves**

CREDIT HOURS: 3

This course investigates the different types of waves known to be important in the ocean, at an advanced level. Topics include: group velocity; surface and internal gravity waves; planetary and topographic waves, nonlinear effects, and various problems related to refraction and interactions with currents.

### **OCEA 5230 Biology of Phytoplankton**

CREDIT HOURS: 3

This course presents the phytoplankton in the context of their evolutionary history and ecological diversity, with an emphasis on their adaptations and acclimation to different environments and their role in food webs and in biogeochemical cycling.

CROSSLISTED: OCEA 4230.03, MARI 4662.03, BIOL 4662.03

### **OCEA 5240 Modules in Oceanography**

CREDIT HOURS: 3

Three modules are taught based on the needs of students in the graduate program. Each module is taught by a suitable faculty member through a combination of lectures, problem assignments, directed reading and group discussion. Potential topics include: Data Assimilation, Observational Technologies, Marine primary productivity, Paleo-oceanography, Turbulence and Mixing, etc.

PREREQUISITES: Permission of instructor

FORMATS: Lecture | Seminar

### **OCEA 5241 Special Topics in Oceanography**

CREDIT HOURS: 3

### **OCEA 5242 Special Topics in Oceanography**

CREDIT HOURS: 3

### **OCEA 5250 Acoustical Oceanography**

CREDIT HOURS: 3

This course covers the basic theory of sound propagation and scattering in the ocean environment, and the applications to acoustic remote sensing of the ocean interior. Topics include: normal modes; ray theory; scattering from particles, bubbles and biota; sonar theory and operation.

CROSSLISTED: OCEA 4250.03

### **OCEA 5285 Marine Biogeochemical Processes**

CREDIT HOURS: 3

This advanced course is designed for students interested in cutting-edge developments in marine biogeochemistry. Topics to be discussed include linkages between climate, marine biogeochemistry, carbon cycling on seasonal to glacial-interglacial timescales, and their perturbations during the Anthropocene. Students will perform a guided literature survey and present selected topics during classes.

PREREQUISITES: OCEA 4130.03/5130.03, OCEA 4140.03/5140.03

FORMATS: Seminar

### **OCEA 5290 Advanced Chemical Oceanography**

CREDIT HOURS: 3

This course presents research topics in chemical oceanography, taught as 3-4 self-contained modules. Examples include, the oceanic CO<sub>2</sub> system and its relation to climate change, chemical reactions in sediments, photochemistry in the upper ocean, and inferring the chemistry of ancient oceans through the isotope record in sediments.

CROSSLISTED: OCEA 4290.03

### **OCEA 5292 Chemical Methods in Oceanography**

CREDIT HOURS: 3

This course provides a more detailed account of analytical methods used in chemical oceanography. Gas chromatography, mass spectrometry, radiochemical, optical, and electrochemical methods will be covered. Emphasis is on techniques that are available either in our own laboratories or at neighboring institutions.

### **OCEA 5293 Advanced Marine Particles**

CREDIT HOURS: 3

This course explores the various roles of particles in the sea and the processes that govern them. Topics include sources and types of marine particles, particle size distributions, settling velocities, mass transfer to and from small particles, mechanics of particle contact, surface chemistry, and erosion, deposition, and transport.

### **OCEA 5311 Fluid Dynamics I**

CREDIT HOURS: 3

An introduction to the theory of fluid dynamics, with some emphasis on geophysically important aspects. Contents: tensor mathematics, flow kinematics, equations of motion, viscous flow, potential flow, convection, turbulence, and basic aerodynamics. Occasional reference will be made to current research topics, especially those in Physical Oceanography.

CROSSLISTED: OCEA 4311.03, PHYC 4311.03/5311.03

### **OCEA 5330 Benthic Ecology**

CREDIT HOURS: 3

A graduate course on major topics of benthic ecology, such as animal-sediment relationships, ecosystem processes and geospatial patterns of structure and dynamics of benthic communities. Courses consist of two lectures per week and one journal discussion session. The last three weeks are devoted to a class research project.

EXCLUSIONS: BIOL 4666.03, OCEA 4330.03, MARI 4666.03

FORMATS: Lecture

### **OCEA 5331 History of Marine Science**

CREDIT HOURS: 3

This course describes the development of the marine sciences from biological, chemical, physical, and geological knowledge going back to the 17th century or earlier. It includes the important voyages of exploration, the development of marine biology, ocean circulation and plate tectonics, also the importance

of technological changes upon marine science.

CROSSLISTED: BIOL 4664.03, HIST 3073.03, HSTC 3331.03, OCEA 4331.03, SCIE 4001.03, MARI 4664.03

### **OCEA 5370 Deep Sea Biology**

CREDIT HOURS: 3

We focus on the biology of organisms inhabiting the deep sea: physiological adaptations to the physicochemical and geological environment; spatial and temporal distributions of biological assemblages; and regulatory factors of these assemblages, such as currents, food availability, reproduction, and recruitment. Also, we delve into unique habitats, such as hydrothermal vents.

CROSSLISTED: BIOL 4370.03, OCEA 4370.03, MARI 4370.03

### **OCEA 5380 Marine Modelling**

CREDIT HOURS: 3

This course provides an overview of modelling techniques for biological and biogeochemical questions in oceanography including the philosophy of modelling, population dynamics, linear and non-linear regression analysis, Principal Component Analysis, numerical approaches to solving differential equations, and visualization. All techniques are introduced with concrete examples and applied to specific problems.

EXCLUSIONS: OCEA 4380.03

### **OCEA 5411 Atmospheric Dynamics I**

CREDIT HOURS: 3

See course description for PHYC 5411.03 in the Physics and Atmospheric Science section of this calendar.

PREREQUISITES: Consent of instructor

CROSSLISTED: OCEA 4411.03, PHYC 4411.03/5411.03

### **OCEA 5412 Atmospheric Dynamics II**

CREDIT HOURS: 3

See course description for PHYC 5412.03 in the Physics and Atmospheric Science section of this calendar.

CROSSLISTED: OCEA 4412.03, PHYC 4412.03/5412.03

### **OCEA 5470 Introduction to Seismic Imaging**

CREDIT HOURS: 3

See course description for EARTH 5470.03 in the Earth Sciences section of this calendar.

PREREQUISITES: Consent of instructor

CROSSLISTED: OCEA 4470.03, EARTH 4470.03, EARTH 5470.03

FORMATS: Lecture | Lab

### **OCEA 5480 Advanced Seismic Imaging**

CREDIT HOURS: 3

See course description for EARTH 5480.03 in the Earth Sciences section of this calendar.

CROSSLISTED: EARTH 4480.03, EARTH 5480.03, OCEA 4480.03

### **OCEA 5505 Atmospheric Physics**

CREDIT HOURS: 3

See course description for PHYC 5505.03 in the Physics and Atmospheric Science section of the calendar.

PREREQUISITES: PHYC 5520.03 or permission of the instructor

CROSSLISTED: PHYC 5505.03, PHYC 4505.03, OCEA 4505.03

FORMATS: Lecture

### **OCEA 5520 Introduction to Atmospheric Science**

CREDIT HOURS: 3

See course description for PHYC 5520.03 in the Physics and Atmospheric Science section of this calendar.

CROSSLISTED: OCEA 4520.03, PHYC 4520.03/5520.03

### **OCEA 5541 Synoptic Meteorology I**

CREDIT HOURS: 3

See course description for PHYC 5540.03 in the Physics and Atmospheric Science section of this calendar.

CROSSLISTED: OCEA 4541.03, PHYC 4540.03/5540.03

### **OCEA 5550 Synoptic Meteorology II**

CREDIT HOURS: 3

See course description for PHYC 5550.03 in the Physics and Atmospheric Science section of this calendar.

CROSSLISTED: OCEA 4550.03, PHYC 4550.03/5550.03

### **OCEA 5570 Light Scattering, Radiative Transfer , and Remote Sensing**

CREDIT HOURS: 3

See course description for PHYC 5570.03 in the Physics and Atmospheric Science section of this calendar.

CROSSLISTED: PHYC 5570.03

### **OCEA 5575 Topics in Atmospheric Radiation**

CREDIT HOURS: 3

See course description for PHYC 6575.03 in the Physics and Atmospheric Science section of this calendar.

CROSSLISTED: PHYC 6575.03

### **OCEA 5580 Cloud Physics**

CREDIT HOURS: 3

See course description for PHYC 6580.03 in the Physics and Atmospheric Science section of this calendar.

CROSSLISTED: PHYC 6580.03

### **OCEA 5595 Atmospheric Chemistry**

CREDIT HOURS: 3

See course description for PHYC 5595.03 in the Physics and Atmospheric Science section of this calendar.

CROSSLISTED: OCEA 4595.03, PHYC 4595.03/5595.03

### **OCEA 5665 Hacking the Blue Planet: The scientific and social dimensions of ocean fertilization**

CREDIT HOURS: 3

See course description for BIOL 5665.03 in the Biology Section of this calendar.

PREREQUISITES: Instructor's permission

CROSSLISTED: BIOL 5665

EXCLUSIONS: OCEAN 4665 and MARI 4665.03

FORMATS: Lecture | Discussion

### **OCEA 5680 Ecosystem Modelling of Marine and Freshwater Environments**

CREDIT HOURS: 3

See course description for ENGM 6680.03 in the Engineering Mathematics section of this calendar.

CROSSLISTED: ENGM 6680.03, ENGM 4680.03



## **OCEA 9000 MSc Thesis**

CREDIT HOURS: 0

Students in the MSc Program must be registered in this course in every term.

## **OCEA 9530 PhD Thesis**

CREDIT HOURS: 0

Students in the PhD Program must be registered in this course in every term.

# **Oral and Maxillofacial Surgery**

Location:

5981 University Avenue

Room 5132

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-1679

Fax Number: (902) 494-6411

Email Address: [omfs.dentistry@dal.ca](mailto:omfs.dentistry@dal.ca)

Website: [www.dalgrad.dal.ca](http://www.dalgrad.dal.ca)

## **Introduction**

The six-year program in Oral and Maxillofacial Surgery and Medicine which starts on June 1st each year is designed to provide students with a comprehensive background for the practice and teaching of Oral and Maxillofacial Surgery, and to qualify them for examination by the Royal College of Dentists of Canada.

Particular emphasis is placed upon the basic sciences, medicine, and clinical hospital surgery practice.

## **Staff**

### **Chair**

**Robertson, C.G.**, DDS, MD, MSc, FRCD(C), Associate Professor

### **Director of Residency Training**

**Gregoire, C.**, DDS, MD, MSc, FRCDC

### **Professor**

**Davis, B.**, DDS, FRCD (C), TMJ reconstruction

**Goodyday, R. H. B.**, DDS, MSc (Dalhousie), FRCD(C), FICD, FACD, Orthognathic and obstructive sleep apnea

### **Associate Professors**

**Gregoire, C.**, DDS, MD, MSc, FRCDC, Director of Fellowship Training Program

**Launcelott, G.**, MD, Department of Anaesthesia, Director Acute Pain Service, QEII

**Robertson, C. G.**, DDS, MD, MSc, FRCD (C), Oral oncology

### **Assistant Professors**

**Brady, J.** DDS, MD, MSc **Doucet, J. C.**, DMD, MD, MSc, FRCD(C)

**Hung, O.**, MD, Cert. in Anaesthesia, FRCP (C)

**Johnson, L.**, HBSc, DDS, MSC, FRCD(C), Oral Pathologist and Oral Medicine Specialist

# Admission Requirements

Candidates to be considered must possess either a DDS or DMD and be eligible for student Licensure in the Province of Nova Scotia (as granted by the Provincial Dental Board of Nova Scotia).

Candidates must register for the entire six years of the program and pay full tuition for the first five years and continuing fees for the sixth year.

Applicants whose first language is not English must provide acceptable scores from a recognized English language proficiency test as defined by Dalhousie University Faculty of Graduate Studies.

Deadline for applications is August 31st of the year preceding commencement of the program. The program start date is June 1st. All supporting documents must be received in the Oral and Maxillofacial Sciences Department by August 31st.

## Application Procedure

To apply for admission to the MD/MSc Oral and Maxillofacial Surgery program you need to submit the following documents:

Completed Application for Admission Form of Graduate Studies [dalgrad.dal.ca/prospectivestudents/admissions/admissioninfo/](http://dalgrad.dal.ca/prospectivestudents/admissions/admissioninfo/)

The following supporting documents are to be sent directly to the department:

1. Original transcripts of all previous academic work. (two copies) (Official transcripts from Dalhousie are not required from current or previous Dalhousie students.)
2. At least two academic letters of reference. The letters should be in sealed envelopes with the referee's signature over the seal.
3. A letter from the Dean of the graduating Dental School indicating the applicant's standing in the class during the four years of the program.
4. Curriculum Vitae, including information regarding academic background and work/volunteer experience.
5. Personal statement outlining the reason for interest in oral and maxillofacial surgery
6. Documentation of English Language Competency. Non-Canadian applicants, whose first language is not English must arrange the submission of original documentation of successful TOEFL or other recognized language test by the Testing Service to the Oral and Maxillofacial Sciences Department.

### Documents should be mailed to:

Department of Oral and Maxillofacial Sciences  
Dalhousie University  
5981 University Avenue, Room 5132  
PO Box 15000  
Halifax, NS B3H 4R2

All documents must be received in the Oral and Maxillofacial Sciences Department by August 31st.

For inquiries regarding applications, email [omfs.dentistry@dal.ca](mailto:omfs.dentistry@dal.ca)

## Doctor of Medicine/Master of Science (MD/MSc) Degree Program Requirements

1. Satisfactory completion or credit for the prescribed courses. It requires the successful completion of 84 credit hours.
2. Satisfactory knowledge and skills in all the phases of clinical oral and maxillofacial surgery
3. Satisfactory completion of a research study and submission of the results in the form of a thesis acceptable to the Director of the program

List of [requirements for degree in Medicine](#).

# Medicine

First Year

Second Year

Clinical Years (Full clinical rotations of all disciplines including those specifically listed above.)

Please refer to the [Four-Year Program](#) in the undergraduate calendar for Medicine.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **ORAL 5000 Anatomy**

CREDIT HOURS: 6

This course is offered during the 1st year, consists of 14 hours of lectures and 36 hours of dissection, and serves as an overview of the anatomy of the chest, thoracic cavity, arm and iliac crest areas of the pelvis. Detailed anatomy of the head and neck shall be covered. Emphasis will focus on anatomical structures and adjacencies as they relate to deformities, injuries and other pathological processes of the head and neck.

### **ORAL 5060 Oral and Maxillofacial Pathology**

CREDIT HOURS: 6

This course is presented to residents over a two-year period, twice during the 4 years of their program. Students study the cause, pathogenesis, clinical, radiographic, and microscopic characteristics of diseases affecting the oral and peri-oral structures. Emphasis is placed on recognition of abnormalities, formulation of differential diagnoses, arrival at definitive diagnoses and patient management.

### **ORAL 5070 Oral and Maxillofacial Surgery Seminar**

CREDIT HOURS: 6

This course is offered during all 6 years of the MSc component of the program. This seminar, with all the Oral and Maxillofacial Surgery Senior Staff and residents, will: 1) review, by subjects, the various major treatment aspects in the total practice of Oral and Maxillofacial Surgery by Resident presentation, 2) have monthly case reviews, 3) discuss on a monthly basis pertinent topics researched in the literature.

CROSSLISTED: ORAL 6040.06, 7010.06, 8010.06

### **ORAL 5080 Clinical Oral and Maxillofacial Surgery**

CREDIT HOURS: 6

Presented during 5 years of the MSc component of the program. A major portion of the Graduate Student's time will be spent in the provision of Oral and Maxillofacial Surgical services for patients. Residents will be given increasing responsibility for the care of out-patients in the Teaching Unit and shall be responsible, through the Senior Resident, to the Chief of the Service. The Senior Resident shall provide care for all in-patients under supervision.

### **ORAL 6030 Oral and Maxillofacial Pathology**

CREDIT HOURS: 6

### **ORAL 6040 Oral and Maxillofacial Surgery Seminar**

CREDIT HOURS: 6

**ORAL 6050 Clinical Oral and Maxillofacial Surgery**

CREDIT HOURS: 6

**ORAL 7000 Oral and Maxillofacial Pathology**

CREDIT HOURS: 6

**ORAL 7010 Oral and Maxillofacial Surgery Seminar**

CREDIT HOURS: 6

**ORAL 7020 Clinical Oral and Maxillofacial Surgery**

CREDIT HOURS: 6

**ORAL 7030 Research**

CREDIT HOURS: 6

A mandatory course that all students must complete in order to graduate. Satisfactory performance in the components of the course is required throughout the degree program in order for the student to be permitted to register for the course in their final year. The main objective of the course is for the student to complete a research project and publish the findings in a thesis format, acceptable to the Thesis Committee, Program Director, and the Faculty of Graduate Studies. The components of the course are as follows: 1. Research Proposal - The student will develop a proposal for their research project. This will be written up and presented to the Thesis Committee prior to the commencement of the study. This component of the course also includes submission of the proposal to the appropriate Research Ethics Board and subsequent approval. This is to be completed by the end of Year 2 of the program. 2.

Presentation of Preliminary Findings - The student is to present preliminary research findings to the Thesis Supervisor prior to the beginning of the final year of the program. This is to be followed by presentation of the preliminary findings at the annual Graduate Student Research Day of the Faculty of Medicine and/or at a national or international conference. 3. Presentation of the Completed Research Project - The completed research project must be presented to the Thesis Committee prior to the Thesis Defence. The complete first draft of the thesis must be made available to members of the Thesis Committee at least two weeks prior to this presentation. This component of the course must be completed by December 15 of the final year of the program.

CROSSLISTED: ORAL 9000.00

**ORAL 8000 Clinical Oral and Maxillofacial Surgery**

CREDIT HOURS: 6

Covered under 5080.06

**ORAL 8010 Oral and Maxillofacial Surgery Seminar**

CREDIT HOURS: 6

Covered under 5070.06

**ORAL 8060 Oral and Maxillofacial Pathology**

CREDIT HOURS: 6

This course is presented to residents four times over the six years of their program. Students study the cause, pathogenesis, clinical, radiographic, and microscopic characteristics of diseases affecting the oral and peri-oral structures. Emphasis is placed on recognition of abnormalities, formulation of differential diagnoses, arrival at definitive diagnoses and patient management.

## ORAL 9000 Thesis

CREDIT HOURS: 0

Covered under 7030.06

## Pathology

Location:

Sir Charles Tupper Building

5859 University Avenue

11th Floor

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2091

Fax Number: (902) 494-2519

Email Address: [pathgrad@dal.ca](mailto:pathgrad@dal.ca)

Website: [pathology.medicine.dal.ca](http://pathology.medicine.dal.ca)

## Admission Requirements

Candidates must satisfy the [general requirements for admission](#) to the Faculty of Graduate Studies. In addition, candidates with the MD degree may be admitted.

## Staff

### Head of Department

Sadek, I.

### Graduate Coordinator

Marcato, P.

## Professors

**Dellaire, G.** BSc, PhD (McGill). Cancer biology, DNA repair

**Greer, W. L.**, BSc, PhD (Western), FCCMG. Human molecular genetics; molecular diagnosis of cancer, Graduate Studies Coordinator

**Hatchette, T.**, MD (Memorial). Virology, infectious diseases, and medical microbiology

**Hoskin, D.**, BSc, PhD (McGill). Tumour immunology, cancer biology, apoptosis

**Issekutz, T.**, MD (Dalhousie), FRCP (C). Pediatric immunology, inflammation, major appointment in Pediatrics

**Liwski, R.**, MD, PhD, FRCPC (Dalhousie). Hematopathology

**Marshall, J. S.**, BSc, PhD (Manchester), major appointment in Microbiology and Immunology. The role and regulation of mast cells in immune responses to bacteria, viruses and tumors, regulation of cytokines in inflammatory bowel diseases and asthma

**Nassar, B. A.**, BSc (Beirut), PhD (Newcastle), MB, BCh (Cairo), FRCP(C). Essential fatty acids and prostaglandins; molecular diagnosis of hyperlipidemias; familial cancers; porphyrias

**Robitaille, J. M.**, MD, FRCSC (McGill). Pediatricophthalmology, human genetics, developmental vascular eye diseases, major appointment in Ophthalmology and Visual Sciences

**Sadek, I.**, MB (Cairo) FRCP. Hematopathology

**Waisman, D.**, BSc (Brandon), PhD (Manitoba), joint appointment in Biochemistry and Molecular Biology

**Xu, Z.**, MD (Shanghai Medical Univ). Pulmonary pathology; cytopathology

## Associate Professors

**Bedard, K.**, BS (St. FX), MSc (Dalhousie), PhD (Atlantic Veterinary College). Oxidative stress; molecular biology; functional genetics

**Easton, A.**, MBBS, PhD (Univ of London). Neuropathology

**Harrison, K.**, PhD, FCCMG (McMaster). Cytogenetics

**Huang, W. -Y.**, MD (Taipei), PhD (Toronto). Anatomic Pathology

**Johnston, B.**, PhD (Calgary), major appointment in Microbiology and Immunology. Inflammation and immune response

**Leblanc, J.**, PhD (Dalhousie). Virology, immunology, and molecular epidemiology

**MacLellan, D.**, MD, BSc, major appointment in Urology. Urinary tract anomalies, proteomics

### **Assistant Professors**

**Boudreau, J.**, PhD (McMaster). Host defense, Natural killer cell biology, cancer immunogenetics, inflammation

**Davis, I.**, MD (Toronto), major appointment in Medicine. Infectious Diseases, Microbiology

**Gujar, S.**, DVM, PhD (Memorial), MHA (Dalhousie). Cancer immunotherapies, oncolytic viruses, applied immunomics, immune metabolism

**Marcato, P.**, BSc, PhD (Alberta). Cancer stem cells, breast cancer

Research for the MSc degree may be conducted in experimental pathology and/or allied fields of medical sciences (e.g., clinical chemistry, hematopathology, histopathology or molecular pathology and molecular genetics) for those planning a career as a laboratory scientist

## **Master of Science (MSc) in Pathology**

This program is intended to give the student a strong background in the experimental approach in pathology. Although the program may be completed in 12 months, most students require 24 months.

The research work and thesis defence are valued at 18 credit hours. All students are required to attend and participate in the research seminar program (PATH 5091.03: Pathology Research Seminar Series) for three credit hours. Those students without a medical background are required to take PATH 5000: General Pathology for three credit hours. Other courses may be required depending upon the background of preparation of the student, the nature of their thesis or the student's career goals, bringing the total requirement to 30 credit hours.

Candidates are expected to participate as appropriate in a weekly series of seminars or journal clubs in immunopathology, laboratory medicine or molecular pathology/genetics.

Research and a thesis are required. The thesis must be defended by oral examination which covers the candidate's area of study and research. Yearly presentations to the Department are required of every candidate.

## **Doctor of Philosophy (PhD) in Pathology**

Pre-requisite for acceptance into this program is a MSc degree in Pathology or other Life Sciences field or an MD degree with research experience. Students entering from a BSc would first enter the MSc program but could transfer to PhD before completing the MSc provided that the student had made satisfactory progress and the project had sufficient scope and depth. Course requirements are the same as for MSc students. Candidates are required to pass both a written and oral comprehensive examination, but the most significant requirement is the preparation and oral defense of his/her thesis describing an extensive original investigation. The minimum time requirement for PhD study is two years for students with a MSc or three years for those transferring from a MSc program.

## **Seminars - Conferences**

A series of weekly seminars, journal clubs, and conferences is conducted throughout the year in various areas of pathology, and laboratory medicine.

## **Areas of Specialization for MSc or PhD Degree**

- Multiprogram Transplantation

- Hematology, Oncology
- Oxidative stress; molecular biology: K. Bedard
- Cancer, cell biology
- Host defense, Natural Killer cell biology, Cancer immunogenetics, inflammation: Boudreau, J.
- Infectious Diseases; Microbiology: I. Davis
- Cancer biology, DNA repair: G. Dellaire
- Neuropathology: A. Easton, S. Croul
- Animal models of diabetes: R. B. Fraser
- Human molecular genetics; molecular diagnosis of cancer: W. L. Greer
- Cancer immunotherapy, Oncolytic viruses, Immuno-metabolism, Applied immunomins, Cell metabolism and Molecular biology: Gujar, S.
- Rheumatology: J. Hanly
- Cytogenetics: K. Harrison
- Medical Microbiology; infectious Disease: T. Hatchette
- Head, neck and eye pathology, ocular pathology
- Chronic rejection; allograft arteriosclerosis; vascular biology; cell adhesion molecules and T cell infiltration; cytolytic cell role in transplantation: G. Hirsch
- Tumor immunology: D. Hoskin
- Anatomic Pathology: W-Y. Huang
- Pediatric Immunology, Inflammation: T. Issekutz
- Inflammation and immune responses: B. Johnston
- Virology, immunology and molecular epidemiology: J. Leblanc
- Transplantation and mechanism of heart failure: J. F. Legaré
- Hematopathology: R. Liwski
- Cancer stem cells, breast cancer: P. Marcato
- Stem cell biology, genome stability, model organisms, translational research: P. Marignani
- Role and regulation of mast cells in immune responses to bacteria, viruses, and tumors. Regulation of cytokines in inflammatory bowel diseases and asthma: J. S. Marshall
- Essential fatty acids and prostaglandins; molecular diagnosis of hyperlipidemias; familial cancers; porphyrias: B. Nassar
- Role of skeletal muscle in epigenetic shaping of organs, tissues, and cell fate choices: B. Kablar
- Developmental vascular eye diseases: J. P. Robitaille
- Hematopathology: I. Sadek
- Molecular mechanisms of metastasis and angiogenesis: D. Waisman
- Pulmonary Pathology; Cytopathology: Z. Xu

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **PATH 5000 General Pathology**

CREDIT HOURS: 3

This course covers basic systems and processes in pathology.

### **PATH 5001 Advanced Mechanisms of Pathology**

CREDIT HOURS: 3

This course will provide an in-depth study of such topics as cell injury, adaptation and repair and inflammatory mechanisms followed by specific diseases of the cardiovascular, central nervous, gastrointestinal, and genitourinary systems.

### **PATH 5013 Biochemistry of Clinical Disorders**

CREDIT HOURS: 3

This course is an introduction to the pathophysiology of disease. It provides the clinical and biochemical background to disease groups and system disorders and the laboratory approach to their diagnosis. Topics include cardiovascular, renal, gastrointestinal, and hepatobiliary disorders, in addition to acid base, carbohydrate, lipid and amino acid disorders; endocrine and rheumatological diseases, as well as tumor markers and toxicology, blood and immune abnormalities.

CROSSLISTED: BIOC 5813.03

EXCLUSIONS: PATH 5011.03, PATH 5012.03 and BIOC 4813.03

FORMATS: Lecture | Discussion

### **PATH 5027 Molecular Mechanisms of Cancer**

CREDIT HOURS: 3

This advanced course focuses on understanding the characteristic hallmarks of cancer, with special attention to cancer treatment in clinics. The multi-step nature of 'carcinogenesis' is the focus of this course. This course dissects the role of oncogenes, tumour suppressors, cell death and survival, differentiation, angiogenesis, metastasis, inflammation, and anti-cancer immunity in cancers. Major research techniques routinely used in cancer research are discussed to fully understand the process of cancer development, progression, and persistence.

PREREQUISITES: Permission of instructor required.

CROSSLISTED: MICI 5027.03

EXCLUSIONS: MICI 4027.03, BIOC 4027.03

FORMATS: Lecture | Discussion | Other (explain in comments)

### **PATH 5035 Human Genetics**

CREDIT HOURS: 3

Topics include inborn errors of metabolism, human development, transmission genetics, DNA structure, gene function, mutation and chromosomal alterations, population genetics, genetics of immunity and cancer, genetic technology in medicine and ethical and social issues related to medical genetics.

CROSSLISTED: BIOL 4035.03/5035.03/BIOC 4835.03

### **PATH 5040 Pathobiology of Cancer**

CREDIT HOURS: 3

This course will outline the pathobiology of neoplasia. It will discuss both normal and abnormal mechanisms of cell growth and differentiation since cancer is ultimately a disease of these processes. The basic biology of carcinogenesis and behaviour of tumors will be highlighted. The clinical aspects of cancer management will also be presented.

CROSSLISTED: BIOC 5503.03, MICI 5040.03

### **PATH 5050 Immunopathology**

CREDIT HOURS: 3

This course will explore the intricacies, functions, and abnormalities of the immune system. Both the humeral and cellular arms of the immune system will be detailed. Immunological deficiencies and autoimmune diseases will be discussed. Clinical aspects of topics such as transplantation and tumour immunology will also be presented.

### **PATH 5066 Directed Readings**

CREDIT HOURS: 3

This course provides an opportunity for individual students to study, in depth, a subject related to pathology that is not offered as a formal course at Dalhousie. A supervisor is chosen for each student, based on his/her expertise and the topic of interest. The student and supervisor meet regularly to discuss assigned readings. The student must prepare a written paper or oral presentation to the Department each term.

EXCLUSIONS: PATH 5065X/Y.06



### **PATH 5067 Directed Readings**

CREDIT HOURS: 3

This course provides an opportunity for individual students to study, in depth, a subject related to pathology that is not offered as a formal course at Dalhousie. A supervisor is chosen for each student, based on his/her expertise and the topic of interest. The student and supervisor meet regularly to discuss assigned readings. The student must prepare a written paper or oral presentation to the Department each term.

EXCLUSIONS: PATH 5065X/Y.06

### **PATH 5068 Directed Readings**

CREDIT HOURS: 3

This course provides an opportunity for individual students to study, in depth, a subject related to pathology that is not offered as a formal course at Dalhousie. A supervisor is chosen for each student, based on his/her expertise and the topic of interest. The student and supervisor meet regularly to discuss assigned readings. The student must prepare a written paper or oral presentation to the Department each term.

### **PATH 5091 Pathology Research Seminar Series**

CREDIT HOURS: 3

The objectives of this course are: 1) to provide a forum for graduate students to develop skills at presenting seminars; 2) to provide constructive evaluation of their research; and 3) to promote interaction between students and faculty.

CALENDAR NOTES: Credit can only be given for this course if X and Y are completed in consecutive terms and partial credit cannot be given for a single term.

### **PATH 5100 Processes and Mediators of Inflammation**

CREDIT HOURS: 3

This advanced course focuses on the cellular and molecular mechanisms of inflammation and consists of lectures and student presentations based on review articles and current research papers. Topics include: inflammatory mediators and receptors, complement, steroids, tissue remodeling and transplant modulation. Current research questions and emerging treatments are emphasized.

CROSSLISTED: MICI 4100.03, 5100.03

### **PATH 9000 MSc Thesis**

CREDIT HOURS: 0

### **PATH 9530 PhD Thesis**

CREDIT HOURS: 0

## **Periodontics**

Location:

Department of Dental Clinical Sciences

5981 University Avenue

Dentistry Building

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-1912

Fax Number: (902) 494-2527

Email Address: [angela.faulkner@dal.ca](mailto:angela.faulkner@dal.ca)

Website: [www.dal.ca/faculty/dentistry/programs/graduate-programs/periodontics.html](http://www.dal.ca/faculty/dentistry/programs/graduate-programs/periodontics.html)

## **Staff**

## Chair

**Loney, R.**, BSc, DMD (Saskatchewan), MSc (Michigan), Prosthodontics

## Director of Graduate Program

**Matthews, D.**, BSc, DDS (Alberta), Dip. in Perio (Toronto), MSc (McMaster), Periodontics

## Professors

**Lee, S. F.**, BSc, PhD (Guelph), Microbiology and Immunology

**Matthews, D.**, BSc, DDS (Alberta), Dip. in Perio (Toronto), MSc (McMaster), Periodontics

## Associate Professor

**Filiaggi, M. J.**, BSc Eng (Penn), MSc, PhD (Toronto), Biomaterials, Biomedical Engineering

**Mello, I.**, DDS (Brazil), MSc, PhD (UBC), Endodontics

## Assistant Professors

**Kraglund, F.**, BSc (UNB), DDS (Dalhousie), MSc (Toronto), Comprehensive Care

**Lee, C.J.**, BSc, MSc Pharmacy (Ottawa), DDS (Dalhousie), Comprehensive Care

**Li, Y. H.**, Msc (UM), DMD (WU), PhD (UM), Microbiology and Immunology

**Michaud, P. L.**, DMD, MSc and Certificate in Prosthodontics (Montreal), Prosthodontics

**Robertson, C.**, DDS (UWO), MD, MSc (Dalhousie), FRCD(C), Oral and Maxillofacial Surgery

**Wright, T.**, BSc Hon (Guelph), DMD (Manitoba), MSc Anatomy (Queen's), Diploma in Periodontics (Toronto), Periodontics

## Adjunct (FGS)

**Brillant, M.**, BSc, PhD (UNB), Research Development Officer

# Admission Requirements

Candidate must have completed a minimum of an accredited four-year DDS program and be eligible for student licensure in the Province of Nova Scotia (as granted by the Provincial Dental Board of Nova Scotia). A minimum of B + average during the undergraduate dentistry program is required. Candidates whose native language is not English may be required to provide acceptable scores from a recognized English proficiency test (i.e., minimum TOEFL score of 100, minimum IELTS score of 7.5).

# Program Description

This program will be a minimum of three consecutive academic years in length. Basic and clinical sciences instruction will be designed to be relevant to the specialty of Periodontics. Program instruction will consist of formal courses and/or seminars, conferences, reading assignments, hospital rounds, laboratory assignments and experience in either a clinical or laboratory research.

Clinical management of patients will include a variety of experiences. Emphasis will be placed upon thoroughness of patient evaluation and accuracy in diagnosis and treatment planning in the treatment of both routine and complex cases. Students will be trained to the level of proficiency in the management of patients with periodontal diseases and mucogingival defects, including, but not limited to, healthy, geriatric patients and medically compromised patients. They will be trained to the level of proficiency in the management of patients with facial pain. They will become proficient in oral medicine and oral pathology as they relate to the periodontium, in managing patients requiring dental implant therapy and in conscious sedation techniques.

While this program is primarily aimed at developing clinical specialists, it is also intended to ensure students' participation in a research experience related to the specialty of periodontics - either in a clinical or laboratory research topic as both an investigator and author, or in the production of a systematic review with meta-analysis. They will be expected to write a scholarly paper to a standard for publication in a refereed journal. A traditional literature review will not be acceptable. In addition, students may choose to take graduate level courses (selected in consultation with their advisor) that are related to their area of research interest. The other Faculty/School involved will be required to approve the student's participation in the elective courses.

# Degree Program

The successful completion of this program will lead to a Master of Periodontics.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **PERI 5110 Clinical Periodontics I**

CREDIT HOURS: 9

Presented in three didactic, laboratory and clinical modules, this course offers students basic and fundamental skills and knowledge required in treating patients who present with various forms of periodontal disease and those in need of dental implants.

### **PERI 5120 Evidence-Based Dentistry and Biostatistics in Graduate Dentistry**

CREDIT HOURS: 3

This course will outline basic research designs and levels of clinical evidence. The dental clinical epidemiology component of this course will cover the scientific basis for clinical decision making in prognosis, causation, diagnosis, and therapy according to the principles of evidence-based healthcare. Examples from the dental literature are used to illustrate these concepts and their practical application. The Biostatistics section is designed to provide graduate students with a basic understanding of the statistical methods used for data analysis and literature interpretation.

### **PERI 6110 Clinical Periodontics II**

CREDIT HOURS: 9

A continuum of Clinical Periodontics I, this course exposes students to more complex cases requiring more advanced treatment modalities. An evidence-based approach to treatment is emphasized throughout the course. Students are expected to document their cases according to the format established by the Royal College of Dentists of Canada (RCDC).

### **PERI 6160 Oral Medicine, Pathology and Radiology for Graduate Dentistry**

CREDIT HOURS: 3

Various advanced imaging modalities in oral radiology will be presented. Emphasis will be placed on the interpretation of abnormalities in the oral and maxillofacial region encountered in the dental specialty practice. Oral soft and hard tissue pathologies involved in infections, developmental defects, reactive hyperplasia, benign and malignant tumors will be discussed.

### **PERI 6180 Oral and Maxillofacial Pathology**

CREDIT HOURS: 6

This course is presented to students over a 2-year period. Students study the cause, pathogenesis, clinical, radiographic, and microscopic characteristics of diseases affecting the oral and peri-oral structures. Emphasis is placed on recognition of abnormalities, formulation of differential diagnoses, arrival at definitive diagnoses and patient management.

CROSSLISTED: ORAL 5060.06, ORAL 6030.06

### **PERI 7110 Clinical Periodontics III**

CREDIT HOURS: 9

A continuum of Clinical Periodontics I and II, this course exposes students to more complex cases requiring more advanced treatment modalities. An evidence-based approach to treatment is emphasized throughout the course. Students are expected to document their cases according to the format established by the Royal College of Dentists of Canada (RCDC).

### **PERI 7130 Graduate Dentistry Seminars**

CREDIT HOURS: 9

This course covers many aspects of specialty practice not covered in other required courses. Students will present clinical cases they treated in the clinic according to the format established by the Royal College of Dentists of Canada.

FORMATS: Seminar

### **PERI 7140 Hospital Rotation for Graduate Dentistry**

CREDIT HOURS: 3

Special clinical rotations in implants, pediatric dentistry, oral medicine/diagnosis and treatment of facial pain and temporomandibular disorders. Students will also be exposed to training in single drug I.V. sedation techniques, and other conscious sedation methods.

### **PERI 7150 Literature Review in Periodontics**

CREDIT HOURS: 9

Taught in a seminar format, this course exposes students to contemporary periodontal and dental implant literature, drawn from various peer-reviewed journals. Students are expected to read and critique the assigned papers and to be able to convey their findings.

FORMATS: Seminar

### **PERI 7170 Research Practicum in Graduate Dentistry**

CREDIT HOURS: 18

The course is designed to enhance the student's critical analysis and presentation skills and expose students to research methodologies. Students will work directly with a faculty advisor in developing a research project, carrying out the research and preparing a presentation for a scientific audience and a manuscript for publication based on their completed research.

FORMATS: Lab | Seminar

## **Petroleum Engineering**

Location:

Sexton Campus  
5248 Morris Street  
Room A108  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-1288

Fax Number:

Email Address: [gsr@dal.ca](mailto:gsr@dal.ca)

Website: [www.dal.ca/engineering/oilandgas](http://www.dal.ca/engineering/oilandgas)

## **Introduction**

Petroleum engineering at Dalhousie is viewed as a specialized professional discipline focused on the fundamental knowledge and skills associated with the production, transport, and processing of petroleum products. The petroleum industry traditionally distinguishes between its "upstream" and "downstream" sectors. Engineers in the "upstream" sector deal with oil and gas reservoir facilities and operations for exploration and production; engineers in the "downstream" sector focus on the transportation, processing, refining and distribution of petroleum products. This one-year, course-based Masters degree is aimed at giving graduate engineers from a variety of engineering disciplines exposure to Petroleum Engineering. The objective is to allow them to transition into the oil and gas sector. Depending upon the applicants engineering background a qualifying year may be required to gain the necessary prerequisite subject matter.

## **Staff**

### **Graduate Coordinator**

Donaldson, A. A., PhD, PEng

## Faculty

Faculty members with appointments in the various disciplinary departments of the Faculty of Engineering and the Faculty of Science who are directly involved in teaching the core Petroleum Engineering program are:

**Garagash, D.**, PhD (Minnesota). Fracture mechanics

## Engineer

**Kujath, M.**, BEng (Dalhousie), PEng

# Master of Engineering (MEng) Degree in Petroleum Engineering

**Admission to the Petroleum Engineering program is suspended. The program will continue to be delivered to any current students until all students have graduated, or the time allowed for program completion has elapsed, or all students have left the program.**

This degree program is designed primarily for graduate professional engineers seeking a thorough introduction to the field of petroleum engineering. The curriculum (academic year 2010-11) consists of a core set of six prescribed courses, one approved elective, a graduate seminar, and a project.

The core courses in petroleum engineering are:

- PETR 6010.03: Reservoir Engineering
- PETR 6030.03: Natural Gas Reservoirs
- PETR 6040.03: Drilling Engineering
- PETR 6050.03: Production Technology
- PETR 6060.03: Petroleum Geoscience
- PETR 6980.03: Directed Studies

Approved elective courses may be chosen from a variety of subjects to suit each student's disciplinary background, oil and gas industry interests, and professional project area. Subjects include advanced courses in engineering disciplines and courses in law, economics, earth science, environmental studies, and oceanography. Descriptions of these courses are in the Graduate Studies Calendar.

Engineering courses from various disciplines are available as electives for students of petroleum engineering. Examples include:

- CHEE 4803.03: Oil and Gas Processing
- CHEE 6737.03: Chemical Process Control
- CIVL 6144.03: Geotechnical Aspects of Waste Management
- CIVL 6147.03: Advanced Theory of Structures
- FOSC 6333.03: Industrial Rheology
- IENG 6912.03: Introduction to Operations Research
- IENG 6918.03: Decision Analysis
- IENG 6924.03: Capital Investment and Capacity Expansion Planning
- MATL 6014.03: Welding Metallurgy
- MATL 6030.03: Fracture of Metallic Materials
- MECH 6510.03: Advanced Mechanics of Solids
- MINE 6001.03: Advanced Rock Mechanics
- MINE 6008.03: Advanced Petroleum Engineering
- MINE 6009.03: Offshore Drilling and Production
- MINE 6010.03: Solid-Liquid Separation
- PETR 6020.03: Enhanced Oil and Gas Recovery

Selections from this list are expected to be consistent with the student's background, interest, and research or project area. Electives may also be chosen from the following list of courses in related disciplines:

- ECON 5516.03: Resource and Environmental Economics 1 (Resources)

- EARTH 5270.03: Applied Geophysics
- LAWS 2104.03: Environmental Law I
- OCEA 5120.03: Physical Oceanography

Both of these elective lists are illustrative and subject to revision.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### PETR 9000 MEng Project

CREDIT HOURS: 0

## Pharmacology

Location:

Sir Charles Tupper Medical Building  
5850 College Street  
6th Floor  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-1384

Fax Number: (902) 494-1388

Email Address: [pharmacology@dal.ca](mailto:pharmacology@dal.ca)

Website: [pharmacology.medicine.dal.ca/](http://pharmacology.medicine.dal.ca/)

## Admission Requirements

Candidates must satisfy the [general requirements for admission](#) to the Faculty of Graduate Studies.

## Staff

### Head of Department

Sinal, C.J.

### Graduate Coordinator

Langille, M.

### Professors

**Denovan-Wright, E. M.**, BSc, PhD (Dalhousie), Molecular neurobiology, Huntington's Disease, gene expression

**Dupré, D. J.**, BSc, PhD (Sherbrooke), Cannabinoids, signalling, cancer, protein complexes

**Fawcett, J.**, BSc, MSc, MSc (T) (McMaster), PhD (McGill), Axon guidance, proteomics, signal transduction

**Howlett, S. E.**, BSc (Concordia), MSc, PhD (Memorial), Cardiovascular pharmacology and electrophysiology, aging and frailty research, sex hormones and heart health

**Kelly, M. E. M.**, BSc, PhD (Southampton), Drug discovery and therapeutics, endocannabinoid system, receptor pharmacology, retinal neurobiology, ocular pharmacology

**McDougall, J.J.**, BSc (Hons), PhD (Glasgow Univ, Scotland), Arthritis, pain, neurogenic inflammation, proteinase activated receptors, cannabinoids

**McMaster, C.**, PhD (Manitoba), Drug discovery, gene discovery, metabolism, inherited diseases

**Pasumarthi, K. B. S.**, DVM (India), PhD (Manitoba), Cardiac regeneration, cell cycle, myocyte apoptosis, cell transplantation, embryonic stem cells, gene expression, cloning, gene transfer and transgenic mice

**Robertson, G. S.**, BSc, PhD (Dalhousie), Neurodegenerative disorders, apoptosis, gene therapy, inflammation, drug discovery, genetic disease models

**Sawynok, J.**, BSc, MSc (Melb), PhD (Queen's), Adenosine, caffeine and pain; novel topical analgesics

**Sinal, C.J.**, BSc, Bioc (McMaster), PhD (UWO), Nuclear hormone receptor, gene regulation, obesity, metabolism, diabetes, bone, osteoporosis

### **Associate Professors**

**Brunt, K. R.**, BSc (Hons) (Saskatchewan), PhD (Queen's), Experimental therapeutics, stem cells, heme metabolism, aging, nanomedicine, regenerative medicine, medical technology, heart failure, cardiac hypertrophy

**Herder, M.**, BSc (Hons) (Memorial, LLB, LLM (Dalhousie), JSM (Stanford), Health Law and policy, law and technology, intellectual property, law and society

**Langille, M. G. I.**, BSc, BCS (UNB), PhD (Simon Fraser), Human genetics, human microbiome, bioinformatics, metabolism, biomarker discovery, drug discovery

### **Assistant Professors**

**Karakach, T.**, MSc, PhD, (Dalhousie), Chemometrics, translational bioinformatics in pharmacology, oncology, environment, and aquaculture

### **Cross Appointments**

**Goralski, K.**, BSc (Hons), PhD (Manitoba), major appointment in College of Pharmacy

**Lehmann, Ch.**, PhD, MD (Humboldt Univ, Berlin), major appointment in Anesthesia

**Top, D.**, BSc (Hons) (Toronto), PhD (Dalhousie), major appointment in Pediatrics

### **Adjunct (Scholar)**

**Ellis, L.**, BSc (Hons), MSc (Guelph), PhD (McGill), major appointment in NRC

### **Instructor**

**Farrell, S.R.**, BSc (Hons), PhD (Dalhousie)

## **Master of Science (MSc) Pharmacology**

Candidates must satisfactorily complete the following courses or their equivalents: PHAC 5405.03: Advanced Pharmacology, PHAC 5409.03: Pharmacology II, PHAC 5508.03: Pharmacology Graduate Seminar. Thesis research (PHAC 9000.00: MSc Thesis), preparation and oral defense of a thesis are required.

## **Doctor of Philosophy (PhD) Pharmacology**

Candidates must satisfactorily complete the following courses or their equivalents: PHAC 5405.03: Advanced Pharmacology, PHAC 5409.03: Pharmacology II, PHAC 5507.03: PhD Lectures, PHAC 5509.03: Graduate Seminar (PhD), and one 5000 level course. For students transferring from a MSc program to PhD program or for students admitted directly to PhD program, a comprehensive examination (PHDP 8000.00: Doctoral Comprehensive Requirement) should be taken in the second year of the program or not later than the beginning of the third year. Thesis research (PHAC 9530.00: PhD Thesis), preparation and oral defense of a thesis are required.

# Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **PHAC 5405 Advanced Pharmacology**

CREDIT HOURS: 3

This required course is a vehicle for graduate students to gain practical familiarity with research level concepts in receptor pharmacology. The main theme is analysis of receptor-mediated events, both in terms of the interaction of a drug at its binding site and in terms of the transduction of that initial signal. Both classical and modern molecular approaches will be discussed. We will also consider related drug discovery strategies. The course has two sessions/week, one a didactic session to introduce concepts and the second a workshop session for discussion of practical assignments.

PREREQUISITES: Normally required PHAC 5409 (Grade of B- or higher)

FORMATS: Lecture | Discussion

### **PHAC 5409 Pharmacology II**

CREDIT HOURS: 3

This course introduces students to various Pharmacology topics, including cell signaling, pain, hormones, special population pharmacology, chemical carcinogenesis, immunopharmacology, drugs of abuse and multiple sclerosis. In addition, students are required to present assigned research articles.

PREREQUISITES: Instructor's consent.

RESTRICTIONS: Restricted to Graduate Students

EXCLUSIONS: PHAC 4001.03

FORMATS: Lecture | Other (explain in comments)

### **PHAC 5507 Pharmacology Practice Teaching**

CREDIT HOURS: 3

This course is to provide Pharmacology Ph.D. students with a useful pedagogical knowledge base with an aim to develop a University level course. Specific emphasis will be on theoretical design, curriculum development and developing an appropriate examination platform consistent with the teaching modality. Practical development of a lecture and/or lecture series will be emphasized.

PREREQUISITES: The course will be run in the second or third year of the PhD program following the successful completion of the comprehensive examination.

RESTRICTIONS: Registered in PhD program, Department of Pharmacology.

FORMATS: Lecture | Seminar | Discussion

### **PHAC 5508 Pharmacology Graduate Seminar (MSc)**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to PHAC 5509 (PhD).

### **PHAC 5509 Phac Graduate Seminar (PhD)**

CREDIT HOURS: 3

See PHAC 5508.

FORMATS: Lecture

### **PHAC 5626 Special Topics in Pharmacology**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to PHAC 5627/PHAC 5628.



CALENDAR NOTES: Review and discussion of relevant literature recorded through a brief written summary. Additional written component encompassing either a term paper or grant proposal, formal departmental seminar. A written outline of the proposed course of study must be submitted for review prior to final approval.

PREREQUISITES: Enrollment as a Dalhousie graduate student in good standing with permission from the students Supervisory Committee and the Pharmacology Graduate Coordinator. Students from departments other than Pharmacology are eligible to be enrolled but require permission from the Graduate coordinator of their own home department as well as the Pharmacology Graduate Coordinator.

FORMATS: Lecture | Discussion

### **PHAC 5627 Pharmacology Special Topics**

CREDIT HOURS: 3

See PHAC 5626.

### **PHAC 5628 Pharmacology Special Topics**

CREDIT HOURS: 3

See PHAC 5626

### **PHAC 5629 Special Topics in Pharmacology**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to PHAC 5627/PHAC 5628.

CALENDAR NOTES: Review and discussion of relevant literature recorded through a brief written summary. Additional written component encompassing either a term paper or grant proposal, formal departmental seminar. A written outline of the proposed course of study must be submitted for review prior to final approval.

PREREQUISITES: Enrollment as a Dalhousie graduate student in good standing with permission from the students Supervisory Committee and the Pharmacology Graduate Coordinator. Students from departments other than Pharmacology are eligible to be enrolled but require permission from the Graduate coordinator of their own home department as well as the Pharmacology Graduate Coordinator.

FORMATS: Lecture | Discussion

### **PHAC 9000 MSc Thesis**

CREDIT HOURS: 0

### **PHAC 9530 PhD Thesis**

CREDIT HOURS: 0

## **Pharmacy**

Location:

Burbidge Building  
5968 College Street

PO BOX 15000

Halifax NS  
B3H 4R2

Phone Number: (902) 494-2378

Fax Number: (902) 494-1396

Email Address: [pharmacy@dal.ca](mailto:pharmacy@dal.ca)

Website: [www.dal.ca/Pharmacy](http://www.dal.ca/Pharmacy)

## Introduction

The goal of the Master of Science degree in Pharmaceutical Sciences program is to educate students to become high quality research-based scientists who can contribute to drug discovery and development in academia and the pharmaceutical industry.

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. More specifically, the admission requirements and standards will be as follows:

1. Any international student, as applicable, will be required to demonstrate an ability to communicate and write in English (minimum acceptable score of 92 for the TOEFL internet-based test, or 7 for the IELTS).
2. At least two letters of support.
3. Appropriate academic background. Students will be considered for acceptance into the Master of Science in Pharmaceutical Sciences via:
  1. a completed BSc (Pharm) or PharmD degree with a suitable letter of recommendation from a faculty member with first-hand knowledge of the potential students' academic abilities.
  2. a completed BSc (honors) degree (or equivalent demonstrated research experience) in a related scientific field, not limited to pharmacology, biochemistry, chemistry, microbiology, chemical or biochemical engineering, with a suitable letter of recommendation from a faculty member with first-hand knowledge of the potential students' academic abilities (e.g. thesis supervisor).
  3. a completed MD, DVSc, DDS, or equivalent with demonstrated research experience with a suitable letter of recommendation from a faculty member with first-hand knowledge of the potential students' academic abilities (e.g., thesis supervisor).

Students without these prerequisites, that wish to be accepted into the program, may enroll in specific courses at Dalhousie in consultation with a potential graduate supervisor, in order to demonstrate their ability and aptitude. Subsequent entry into the MSc (Pharmaceutical Sciences) in a later academic year will be dependent upon satisfactory performance in the chosen courses and is not guaranteed.

## General Regulations

All graduate students are required to carry out novel, original research. In addition, all graduate students are required, as part of their training, to present and participate in graduate student seminars, and to attend invited speaker seminars. The learning outcomes of this program are as follows:

1. Students will be competent in performing general laboratory techniques as well as techniques specific to their chosen area of research.
2. Students will be able to develop and execute a research project.
3. Students will develop scientific writing skills through the writing of a thesis and scientific paper(s) that result from their research.
4. Students will develop oral presentation skills through their participation in the seminar series and thesis committee meetings.
5. Students will develop the ability and confidence to clearly and succinctly communicate the results of their research to the scientific community.
6. Students will develop clinical thinking skills required of a researcher.

## Staff

### Director of College

**Mansour, S. A.**, BSc (Pharm), MBA (Dalhousie), PhC

### Associate Director Research

**Sketris, I. S.**, BSc (Pharm) (Toronto), PharmD (Minn), MPA (HSA) (Dalhousie)

### Graduate Coordinator

**Jakeman, D. L.**, BSc, PhD (Sheffield)

## Professors

**Agu, R.**, BPharm, MPharm (Pharmacology) (Univ Nigeria), MPharm (Pharmaceutics), PhD (Biopharmaceutics) (Katholieke Universiteit, Belgium)

**Goralski, K.**, BSc (Biochem/Micro), PhD (Pharmacology and Therapeutics) (Manitoba)

**Jakeman, D. L.**, BSc, PhD (Sheffield). Applications of enzymes and carbohydrates, protein engineering, medicinal chemistry

**Jurgens, T.**, BSc (Pharm), MSc (Dalhousie), PhD (Miss)

**Yeung, P. K. F.**, BSc (Pharm), MSc (Man), PhD (Saskatchewan). Pharmacokinetics, Drug Metabolism, and Biomarker Assessment

# Master of Science (MSc) Degree

## Full-time Program

The Master of Science in Pharmaceutical Sciences program will normally be completed in two years of full-time study. Candidates must satisfactorily complete PHAR 5001.03: Pharmaceutical Sciences "From Drug Discovery to Therapeutics" and a minimum of two of the elective courses. Candidates will be permitted to select alternative courses with the permission of the Graduate Coordinator and Research Supervisor. In addition, all students will be required to take the Integrated Health Research Training Program ([www.ihrtp.ca](http://www.ihrtp.ca)). There will be no credit provided for this seminar series but there will be a notation on the student's transcription following successful completion. Following completion of these courses, the students will complete PHAR 9000.00, their MSc thesis. The program will be structured using a combination of courses and thesis-based research, with a supervisor and supervisory committee overseeing progress. Financial support is available for all students accepted into the program, either from the student's supervisor, funding within and available to the College of Pharmacy, or a combination of these sources.

## Part-time Program

The full-time MSc course requirements and thesis regulations apply. The thesis must be supervised by a member of the College of Pharmacy.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

A core graduate course (5001) and advanced courses (6000) are offered. The core course constitutes the main framework of a student's formal course work and is designed to be broad-based but at an advanced level. It is intended to help the student gain a wide understanding in several major areas of the pharmaceutical sciences and thus students are strongly encouraged to take some courses outside their area of specialization. Specialized courses provide the opportunity for in-depth study of selected topics which are more closely related to the student's research area.

## Course Descriptions

### PHAR 5001 Pharmaceutical Sciences "From Drug Discovery to Therapeutics"

CREDIT HOURS: 3

This course discusses the fundamental sciences involved in the discovery and development of new drugs. It presents an overview of the techniques used in each scientific field and the important role each plays in the drug discovery process.

PREREQUISITES: CHEM 3601.03 and BIOC 3200.03 (all grade B or higher) or B.Sc (Pharm) or by instructor's consent

FORMATS: Lecture | Tutorial | Seminar | Discussion

### **PHAR 6010 The Chemistry and Pharmacology of Bioactive Compounds from Plants**

CREDIT HOURS: 3

The chemistry and pharmacology of medicinally important natural health products (NHPs) will be explored. Emphasis will be on factors that affect content of products and the impact on efficacy of NHPs.

PREREQUISITES: PHAR 5001.03 or by instructor's consent

FORMATS: Lecture | Discussion

### **PHAR 6030 Drug Transporters in Pharmacology and Therapeutics**

CREDIT HOURS: 3

Drug transporters exist in every organ in the body and can affect therapeutic responses to medications. Through a combination of lectures and student presentations the course will cover the major drug transporter families and examine the clinical importance of drug transporters with respect to drug absorption, distribution, elimination, efficacy, and toxicity.

PREREQUISITES: PHAR 5001 or PHAC 5406 and PHAC 5409 or PHYL 5323 or equivalent. Consent from the course instructor will be required for those students without these prerequisites

FORMATS: Lecture | Discussion

### **PHAR 6040 Pharmacokinetics, Metabolism and Biomarker for Preclinical and Clinical Drug Development**

CREDIT HOURS: 3

The course provides lectures and laboratory experience in the concepts and techniques involved in pharmacokinetics, metabolism, and biomarker science research for preclinical and clinical drug development.

PREREQUISITES: PHYL 3320.03; PHYL 3120.03; BIOC 3200.03; CHEM 3202.03; MICI 3115.03; FOSC 3010.03; CHEE 2420.03; BIOE 3241.03; BIOL 3050.03; or consent of instructor

FORMATS: Lecture | Lab | Seminar

### **PHAR 6050 Biopharmaceutical Aspects of Preclinical Drug Development**

CREDIT HOURS: 3

The course will cover biopharmaceutical aspects of preclinical drug development including basic and advanced concepts in drug delivery using in vitro, in vivo and in silico approaches.

PREREQUISITES: Undergraduate courses in any of the following disciplines: Pharmaceutics, Pharmacology, Physiology, Biochemistry, Physical chemistry, or other related courses

FORMATS: Lecture | Discussion

### **PHAR 6080 Chemical Biology: Understanding Biological Processes using Chemical Approaches**

CREDIT HOURS: 3

This course discusses the use of chemical methods and techniques to probe biological systems. Examples will include the use of bi-functional molecules for delivery into cell systems to probe cellular function, approaches for affinity-based protein profiling and the use of chemical synthesis to identify potent enzyme inhibitors.

PREREQUISITES: CHEM 3601.03 and BIOC 3200.03 (all grade B or higher) or B.Sc (Pharm) or by instructor's consent

FORMATS: Lecture | Tutorial | Seminar | Discussion

### **PHAR 9001 MSC Thesis 1**

CREDIT HOURS: 0

A research thesis (PHAR 9001.00) comprising publishable work by the student will be carried out under the direct supervision of one of the faculty members of the College of Pharmacy (the principal supervisor) with expertise in the pharmaceutical sciences, subject to the regulations of the Faculty of Graduate Studies. The principal supervisor will be appointed to the College of Pharmacy and have earned a Ph.D. or have equivalent research experience, as judged by the faculty members of the College of Pharmacy and be a member of the Faculty of Graduate Studies at Dalhousie University.

### **PHAR 9002 MSc Thesis 2**

CREDIT HOURS: 0

A research thesis (PHAR 9002.00) comprising publishable work by the student will be carried out under the direct supervision of one of the faculty members of the College of Pharmacy (the principal supervisor) with expertise in the pharmaceutical sciences, subject to the regulations of the Faculty of Graduate Studies. The principal supervisor will be appointed to the College of Pharmacy and have earned a Ph.D. or have equivalent research experience, as judged by the faculty members of the College of Pharmacy and be a member of the Faculty of Graduate Studies at Dalhousie University.

# Philosophy

Location:

6135 University Avenue

PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: (902) 494-3810  
Fax Number: (902) 494-3518  
Email Address: [dalphil@dal.ca](mailto:dalphil@dal.ca)  
Website: [www.philosophy.dal.ca](http://www.philosophy.dal.ca)

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

**Application Deadline: we encourage applicants to have material submitted by January 15th. The absolute deadline for receipt of applications is January 31st.**

## Staff

### Chair of Department

Hymers, M.

### Graduate Coordinator

Scherkoske, G.

### Professors Emeriti

**Campbell, R. M.**, BA (Harvard), PhD (Cornell). Interests: Moral theory, epistemology, feminist theory, and philosophy of biology

**Schotch, P.K.**, PhD (Waterloo), Munro Professor of Metaphysics (ret)

**Sherwin, S. B.**, BA (York), PhD (Stanford), FRSC, University Research Professor. Interests: Feminist theory, bioethics, ethics

### Professors

**Hymers, M.**, BSc, MA (Dalhousie), PhD (Alberta). Interests: Epistemology, philosophy of language, Wittgenstein, Munro Professor in Metaphysics

**MacIntosh, D.**, BA (Hons) (Queens), MA (Waterloo), PhD (Toronto). Interests: Philosophy of language and science, meta-ethics, decision theory, action theory, metaphysics

### Associate Professors

**Abramson, D.**, BA (Hons) (Toronto), MSc, PhD (Indiana). Interests: Philosophy of computing, philosophy of cognitive science, and philosophy of mind

**Borgerson, K.**, BA (Saskatchewan), MA, PhD (Toronto). Interests: Philosophy of medicine, bioethics, philosophy of science, feminist philosophy

**Fenton, A.**, BA Hons (Acadia), MA (Dalhousie), PhD (Calgary). Interests: Animal Ethics, Naturalized Epistemology, Neuroethics, Philosophy of Animal Behaviour and Cognition.

**Jeffers, C.**, BA (Hons) (York), PhD (Northwestern). Interests: Africana Philosophy, Philosophy of Race, Ethics, Social and Political Philosophy

**Meynell, L.**, BA (Hons) (York), MA (Calgary), PhD (Western). Interests: Philosophy of science, epistemology, feminist philosophy, and aesthetics

**Scherkoske, G.**, BA (Hons) (Clark), MA (Simon Fraser), PhD (Cambridge). Interests: Moral and political philosophy, practical reasoning.

### Assistant Professors

**Hildebrand, T.**, BA (Pacific Lutheran), PhD (Colorado at Boulder). Interests: Metaphysics and Epistemology

**Kapusta, S.**, MA (Western), PhD (Imperial College, UK), PhD (Frankfurt AM Main, Germany), PhD (Western). Interests: Feminist Philosophy, Social and Political Philosophy, Ethics

### **Cross-listed Faculty**

**Frappier, M.**, BScA, MA (Laval), PhD Western

**McOuat, G.**, BA, MA, PhD (Toronto)

### **Cross-Appointments**

**Baylis, F.**, BA (McGill), MA, PhD (Western), CM, ONS, FRSC, FCAHS, University Research Professor, cross appointment with the Faculty of Medicine.

**Diamond, E.**, BA (Vind), MA (Dalhousie), PhD (Northwestern), cross appointment with the Department of Classics

**Doolittle, F.**, PhD (Stanford)

### **Adjunct (FGS)**

**Barresi, J.**, BS (Brown), MA (Southern California), MS, PhD (Wisconsin)

**Brett, N. C.**, BA (New Hampshire), MA, PhD (Waterloo)

**Burns, S. A. M.**, BA (Hons) (Acadia), MA (Alberta), PhD (London)

**Burrow, S.**, BA (Dal), MA (Alberta), PhD (Western)

**Campbell, R. M.**, BA (Harvard), PhD (Cornell)

**Gannett, L.**, BSc, MA, PhD (Western)

**Kernohan, A.**, MA (Dalhousie), PhD (Toronto)

**Maitzen, S. A.**, BA (Northwestern), MA, PhD (Cornell)

**Schellenberg, J.**, BA, MA (Calgary), DPhil (Oxford)

**Sherwin, S. B.**, BA (York), PhD (Stanford) FRSC

**Skitolsky, L.**, BA (Skidmore College), PhD (Emory University)

**Vinci, T.**, BA (Toronto), PhD (Pittsburgh)

**Watkins, M.**, BA, MA (Tennessee), PhD (Ohio State)

**Wein, S.**, BA Hons, MA, PhD (Waterloo)

## **Master of Arts (MA)**

For minimum time required to complete this program, see the [Faculty of Graduate Studies Regulation 1.3.1](#) in this calendar

### ***One Year***

For students with an Honours BA or equivalent in philosophy. Requirements include 18 credit hours (of which at least nine credit hours are Seminar Courses) and a thesis.

### ***Two Year***

For those with an honours degree in a related field. Requirements include 24 credit hours in the first year, 18 credit hours (of which at least nine credit hours are Seminar Courses) in the second year, and a thesis.

### ***Part-Time***

A part-time MA over a longer period is available for fully qualified students.

## **Doctor of Philosophy (PhD)**

For students with an MA in philosophy.

For minimum time required to complete this program, see the Faculty of Graduate Studies regulations. Doctoral students are required to take 18 credit hours including at least four Seminars (see “[Course Descriptions](#)” below) beyond the requirements for the MA. The program includes four comprehensive examinations in the second year. Where a student’s thesis research demands it,

reading knowledge will be required in one language other than English in which a significant body of philosophical literature exists. Completion of the program requires original research on a project of substantial dimensions, culminating in the submission and oral defence of a thesis. This research should be in an area already well-established as a specialty by members of the department, such as, epistemology, ethics, bioethics, philosophy of mind, feminist philosophy, political and social philosophy, and philosophy of language. Doctoral students are expected to present two papers at Departmental colloquia as part of their program of studies.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

The Philosophy Department offers three kinds of graduate courses: General, Seminar, and Directed Study. *General* courses survey a wide range of topics and are designed to acquaint students with the major theories and developments in a field. They are suitable for those who have not specialized in the field as an undergraduate. *Seminar* courses, which assume some previous exposure to the subject, are central to the graduate program. Students in the MA program must take a minimum of nine credit hours as part of their total (18 credit hours). Students in the PhD program must take at least 12 credit hours as part of their total (18 credit hours). These Seminars are designed to deepen the student's understanding of an area by focusing on a specific theme or problem. *Directed Study* courses are developed jointly by a student and the instructor in special cases to suit individual interests and needs. For example, a student with no previous training in modern symbolic logic would complete a directed study course. This may include attending a course that provides a comprehensive introduction to the subject and completing some additional work. These courses are subject to departmental approval.

NOTE: The courses listed are half-year, unless otherwise indicated, and not all are given in any one year. Instructors in seminar courses are likely to vary from year to year. Consult the department for further information.

## Course Descriptions

### PHIL 5051 Epistemology

CREDIT HOURS: 3

A study of fundamental issues in the theory of knowledge. The course examines skepticism, and investigates the nature of knowledge, belief, meaning, evidence, and truth. Questions are raised about perception and memory and their relation to knowledge as are questions about our knowledge of ourselves and other people.

CROSSLISTED: PHIL 3051.03

FORMATS: Lecture | Discussion

### PHIL 5055 Topics in Epistemology

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in epistemology and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

CROSSLISTED: PHIL 4055.03

FORMATS: Seminar

### PHIL 5070 Topics in Philosophical Psychology

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in the philosophy of psychology and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the web.

CROSSLISTED: PHIL 4070.03

FORMATS: Seminar

### **PHIL 5105 Ethics**

CREDIT HOURS: 3

A systematic study of the foundation of morality, including readings from central sources in both classical and contemporary moral theory.

EXCLUSIONS: Phil 3105 (co-located)

FORMATS: Lecture | Discussion

### **PHIL 5110 History of Ethics: Plato to Epicurus**

CREDIT HOURS: 3

In this course we will carefully read a number of seminal works in the history of Western Moral Philosophy covering Plato, Aristotle, Stoicism and Epicureanism.

CROSSLISTED: PHIL 3110.03

### **PHIL 5111 History of Ethics: Kant's Moral Theory**

CREDIT HOURS: 3

In this course we will look closely at one of the most seminal thinkers in the history of Western Moral Philosophy. The course will explore Kant's own writing, some of his most important predecessors, and contemporary commentators. The course will aim to develop a plausible understanding of Kantian ethics - including both its normative and meta-ethical commitments. A primary concern will be the relevance of Kant's views for contemporary moral reflection.

CROSSLISTED: PHIL 3115.03

### **PHIL 5115 Topics in Ethics I**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in ethical theory and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

CROSSLISTED: PHIL 4115.03

FORMATS: Seminar

### **PHIL 5120 Theory of Rational Decision**

CREDIT HOURS: 3

How would rational people choose which actions to do given what they desire? We will see that theories about this have evolved to respond to such toy problems as the Prisoner Dilemma and The Deterrence Paradox. We then explore the relationship between rationality and other phenomena. e.g., is it always rational to be moral? Are persons necessarily rational? (What about those with mental health issues?) Would rational persons always be prudent, i.e., always make choices now in light of desires they expect to have, not just those they currently have? Are good laws necessarily ones people would find it rational to accept and follow? We eventually examine whether rationality is grounded in people's actual desires, or whether there are objective constraints on desires it is rational to have and to choose from, whether desires are relevant at all, and whether there can be a single standard of rationality for all times and all people. Throughout we apply philosophical accounts of rationality to selected issues of moment, e.g., to issues in war, governance, democracy, intelligence, and cyber ethics, many of these dealt with as they arise in processing issues being mooted by the American think tank, the Center for Ethics and the Rule of Law. The association between that think tank and the class means that students can expect to have influence at the highest levels of government and policy.

EXCLUSIONS: PHIL 4120.03

FORMATS: Seminar

### **PHIL 5125 Topics in Ethics II**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in ethics and investigate it in detail when the course is offered. The topic is assigned by the department at the end of the preceding academic year and is then posted at the department and in the faculty's timetable on the Web.

CROSSLISTED: PHIL 4125.03

FORMATS: Seminar



**PHIL 5140 Logic: Logical Theory I**

CREDIT HOURS: 3

An introduction to metalogic, with special attention to the soundness and completeness of formal systems, and to the philosophical evaluation of non-classical logics.

PREREQUISITES: PHIL 2130.03 or equivalent

CROSSLISTED: PHIL 3140.03

FORMATS: Lecture | Discussion

**PHIL 5150 Contemporary Metaethics**

CREDIT HOURS: 3

This seminar course surveys contemporary work in metaethics – the branch of moral philosophy concerned with the metaphysical, epistemological, semantic, and psychological commitments of moral discourse and practice.

CROSSLISTED: PHIL 4150.03

FORMATS: Seminar

**PHIL 5165 Logic: Logical Theory II**

CREDIT HOURS: 3

Devoted primarily to the study of formal semantics and its relation to symbolic language.

PREREQUISITES: Permission of the instructor.

EXCLUSIONS: Phil 4165 (co-located)

FORMATS: Lecture | Discussion

**PHIL 5170 Contemporary Feminist Theories**

CREDIT HOURS: 3

Contemporary feminism is not a single theory but comprises multiple theoretical perspectives, reflecting both a diversity in women's experience of subordination and a diversity of interests and approaches. This course aims to present some of the richness and variety in feminist theory while offering students the opportunity for sustained critical engagement with influential feminist thinkers.

CROSSLISTED: GWST 3500.03, PHIL 3170.03

FORMATS: Lecture | Discussion

**PHIL 5190 Topics in the History of Philosophy I: Wittgenstein**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in the History of Philosophy and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

CROSSLISTED: PHIL 4190.03

FORMATS: Seminar

**PHIL 5191 Topics in the History of Philosophy II**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in Modern Philosophy (e.g., the work of Descartes or Spinoza) and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

CROSSLISTED: PHIL 4191.03

FORMATS: Seminar

**PHIL 5192 Topics in the History of Philosophy III**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in Modern Philosophy (e.g., the work of Locke or Hume) and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

CROSSLISTED: PHIL 4192.03

FORMATS: Seminar

### **PHIL 5200 Topics in Normative Theory**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in Normative Theory (e.g., Environmental Justice, Meta-Ethics, Peace and War, Evolutionary Ethics) and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

CROSSLISTED: PHIL 4200.03

FORMATS: Seminar

### **PHIL 5211 Philosophy of Law**

CREDIT HOURS: 3

Is coercion central to law? How are law and morality related? What justification can be given for punishment? What is the appropriate scope of individual liberty? These and other issues relating to the analysis and evaluation of law will be considered. The course will examine the competing claims of the Positivist, Realist, and Natural Law accounts of law before turning to some normative issues concerning the justification of legal practice.

CROSSLISTED: PHIL 3211.03

FORMATS: Lecture | Discussion

### **PHIL 5220 Contemporary Philosophical Issues**

CREDIT HOURS: 3

Intensive study of a few topics which are currently being debated and may fall outside of or cut across standard classification of areas of interest. Examples are: evolution and value, philosophical accounts of "race" and culture, artificial intelligence, theories of causation, supervenience.

CROSSLISTED: PHIL 4220.03

FORMATS: Seminar

### **PHIL 5300 Philosophy of Language**

CREDIT HOURS: 3

How is it possible for this string of marks to ask you a question? What is it for a word to have a meaning? Is the meaning of a word an idea that you associate with it? Is it the objects in the world that it picks out? Is it an abstract "object" of some kind? What is the relationship between language and the world? Between words and sentences? Between what I mean and what I say? Between saying and acting? Between what I say and what you understand? Between meaning and linguistic use? Between meaning and behaviour? Between meaning and truth? Between the literal and the metaphorical? Is there any fact of the matter about what a linguistic expression means? Is there any such thing as linguistic meaning at all? This introduction to some major themes in the Philosophy of Language will explore answers to such questions as these, focusing on the work of such figures as Locke, Frege, Russell, Wittgenstein, Carnap, Quine, Chomsky, Austin, Langton, Saul, Searle, Hesse and Davidson.

PREREQUISITES: Two previous classes in philosophy including one logic course, half or full year

EXCLUSIONS: PHIL 3300.03

FORMATS: Lecture | Discussion

### **PHIL 5420 Philosophy of Biology**

CREDIT HOURS: 3

This course provides an up-to-date examination of central issues in the philosophy of biology. Topics typically include: How far can the Darwinian paradigm be taken to explain adaptive complexity? Is the new emphasis on developmental theory likely to revolutionize evolutionary theory? What are the most fundamental units of selection? Can the concept of biological function be understood without attributing purpose to nature? Why is the concept of species so elusive? Is there a human nature? Is genuine altruism possible given the forces of selection? Is there progress in evolution? How should clashes between faith and reason over the nature of our evolution be resolved?

EXCLUSIONS: BIOL 3580.03, PHIL 3420.03

FORMATS: Lecture | Discussion

### **PHIL 5445 Philosophy of Mind: The Mind-Body Problem**

CREDIT HOURS: 3

This course will critically examine philosophical and scientific articles, and possibly short works of fiction, which explore various theories, problems, and arguments regarding the status of minds in the physical world and the relationships between mind, body and world. We will explore and discuss controversies regarding the thesis that the mind is (nothing but?) the brain, and issues such as the theoretical foundations of artificial intelligence, the problem of subjectivity and consciousness, "naturalized" intentionality (how thoughts--if they are physical things or processes-- can have the property of being about other things), and animal cognition.

PREREQUISITES: Two previous courses in philosophy  
EXCLUSIONS: PHIL 5440.03 and PHIL 3445.03 (co-located)  
FORMATS: Lecture | Discussion

### **PHIL 5450 Philosophy of Emotions**

CREDIT HOURS: 3

We will concentrate on the resurgence of philosophical interest in the emotions over the last twenty years. Although it is obvious that much human action is emotionally driven, traditionally many philosophers have expressed skepticism about the value of emotions to rational and ethical conduct. Recently, philosophers such as Martha Nussbaum, Amelie Rorty and Ronald De Sousa have argued that rationality requires emotions. Other philosophers have argued that we need a renewed assessment of the epistemic importance of emotion in revealing power and value. Topics will include emotional rationality; emotion and value; first person authority; cognitive, social constructivist and psycho-evolutionary approaches; emotion and feminist epistemology; emotion, power, and racial construction.

PREREQUISITES: Two previous courses in philosophy

CROSSLISTED: PHIL 3450.03

FORMATS: Lecture | Discussion

### **PHIL 5470 Contemporary Liberalism and Democracy**

CREDIT HOURS: 3

Liberalism takes a variety of forms and includes many topics including the rule of law, limited government, the free exchange of goods, entitlement to property, the self, and individual rights. Its philosophical and political assumptions provide the intellectual context within which its account of the individual, its vision of the community and its preferred allocation of resources will be assessed. Recent work in democratic theory will also be explored.

CROSSLISTED: POLI 5479.03

EXCLUSIONS: PHIL 4470.03, POLI 4479.03

FORMATS: Seminar

### **PHIL 5476 Liberalism and Global Justice**

CREDIT HOURS: 3

This is a course in normative political theory. We will critically examine some recent normative political theory, and then examine the prospects and perils of attempts by recent liberal theory to articulate a principled vision of global justice. We will consider Rawls' original bounded theory of justice and examine some challenges it faces from both cosmopolitan theories of justice and proponents of nationalism. Next, we will consider rival political conceptions of liberal international justice, and Rawls' response in the form of his recent "The Law of Peoples." Concluding, we will examine specific issues of applied political justice (namely, human rights and immigration) as well as issues of economic and social justice and poverty.

PREREQUISITES: 1 credit in Philosophy or Political Science or permission of instructor

EXCLUSIONS: PHIL 3476, POLI 3476.03 (co-located)

FORMATS: Lecture | Discussion

### **PHIL 5500 Topics in Feminist Philosophy**

CREDIT HOURS: 3

In this course we shall explore some of the current research in a focused area of feminist philosophy. Previous topics have included feminist ethics, feminist epistemology, postmodern feminism, the feminist sexuality debates, and ecofeminism.

CROSSLISTED: GWST 5500.03, PHIL 4500.03

FORMATS: Seminar

### **PHIL 5510 Topics in Philosophy of Language**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in the Philosophy of Language and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

CROSSLISTED: PHIL 4510.03

FORMATS: Seminar

### **PHIL 5520 Philosophy of Social Science**

CREDIT HOURS: 3

Can people from different cultures understand each other? What is it to be a member of a culture? Are societies best thought of as collections of individuals, or are individuals constituted by societies? In what sense are the social sciences "sciences"? Are societies describable by explanatory laws?

What counts as an explanation of human behaviour? This course explores these and related questions through a reading of classic and contemporary philosophers and social theorists.

CROSSLISTED: PHIL 3520.03, POLI 3496.03

FORMATS: Lecture | Discussion

### **PHIL 5530 Freedom, Action, and Responsibility**

CREDIT HOURS: 3

An investigation of the nature of action, seeking criteria for individuating, describing, and explaining actions. Topics may include the roles of volitions, intentions, motives, and reasons in actions; responsibility for actions and the concept of free action.

CROSSLISTED: PHIL 3530.03

FORMATS: Lecture | Discussion

### **PHIL 5630 History of Philosophy: Kant**

CREDIT HOURS: 3

In this course we study Kant's theoretical philosophy, centering on the two editions of the Critique of Pure Reason, the Prolegomena and some of the earlier writings, including the 1768 (pre-critical) writing, *Regions of Space*.

CROSSLISTED: PHIL 3630.03

FORMATS: Lecture | Discussion

### **PHIL 5635 History of Philosophy: 19th-Century Philosophy**

CREDIT HOURS: 3

This course will study the major figures in 19th-century philosophy between Kant and Russell: Fichte, Hegel, Schopenhauer, Marx, Kierkegaard, Mill, Nietzsche, James, and Bradley. Attention will also be paid to some important figures in related arts and sciences (e.g., Beethoven, Wagner, Ibsen, Feuerbach, Darwin, Freud, Wollstonecraft, Frege). We shall trace the main lines of development in epistemology and metaphysics as well as in ethics and political philosophy.

CROSSLISTED: PHIL 3635.03

FORMATS: Lecture | Discussion

### **PHIL 5640 History of Philosophy: Twentieth-Century Philosophy**

CREDIT HOURS: 3

The Twentieth Century has been a period of revolutionary change in Anglophone philosophy. This course surveys the most influential figures, including Wittgenstein, Quine, Moore, and Austin.

CROSSLISTED: PHIL 3640.03

FORMATS: Lecture | Discussion

### **PHIL 5660 Postmodern Philosophy**

CREDIT HOURS: 3

Modern philosophy is a philosophical perspective in which individuals and their conscious thoughts are paramount. Postmodern philosophy rejects this perspective, replacing it with one in which language and society are paramount. We shall study this perspective in the writings of post-Wittgenstein philosophers like Rorty in the English-speaking world as well as those like Derrida, Irigaray and Habermas on the Continent.

CROSSLISTED: PHIL 3660.03

FORMATS: Lecture | Discussion

### **PHIL 5670 Philosophy of Science**

CREDIT HOURS: 3

This course offers an advanced survey of issues in the philosophy of science. Topics typically include: The demarcation between science and pseudo-sciences; scientific method and explanation; metaphysical assumptions of science and the role of values in scientific method and practice. Particular attention will be paid to key episodes in 20th Century philosophy of science. No scientific background is presupposed.

PREREQUISITES: At least two previous courses in philosophy, including one half-or full-year logic course such as PHIL 2660.03

CROSSLISTED: PHIL 3670.03

FORMATS: Lecture | Discussion

### **PHIL 5680 Topics in the Philosophy of Science**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in the Philosophy of Science and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

CROSSLISTED: PHIL 4680.03

FORMATS: Seminar

### **PHIL 5700 Philosophy of Race**

CREDIT HOURS: 3

This course explores the metaphysics and ethics of race. Topics covered include: what "race" means; how old the concept is; whether races exist; what kinds of thing races are and what counts as racism.

PREREQUISITES: At least two previous credits in Philosophy or permission of instructor

EXCLUSIONS: PHIL 4700 (co-located)

FORMATS: Seminar

### **PHIL 5801 Topics in Ethics and Health Care**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in Ethics and Health Care and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

PREREQUISITES: Graduate student or permission of the instructor.

CROSSLISTED: PHIL 4801.03, BIOT 5801.03

FORMATS: Seminar

### **PHIL 5805 Philosophy of Medicine**

CREDIT HOURS: 3

Is medicine a science? How should we define health and disease? Do definitions of disease help us to understand cognitive disabilities or disorders? Is a risk for a disease, for instance high cholesterol, itself a disease or is this a misuse of the concept? Should health care professionals provide care whenever a patient claims to be suffering or only when the patient has a recognized disease or disorder? What are the implications of classifying too much of normal human experience as disordered? Are screening tests, for instance, mammography, typically a good idea because it is better to be safe than sorry? Should health care providers aim to practice evidence-based medicine? Should complementary and alternative medicine be held to the same epistemic standards as mainstream medicine? In this class, we consider these questions, among others. This course aims to explore perspectives on the most important philosophical issues in the emerging field of philosophy of medicine, with particular attention to medical epistemology and metaphysics.

PREREQUISITES: Two previous credits in Philosophy (including ideally Philosophy 2805 and 2810)

CROSSLISTED: PHIL 3800

FORMATS: Seminar

### **PHIL 5851 Metaphysics**

CREDIT HOURS: 3

A study of topics such as the nature of substance and change, body and mind, cause and effect, and the concept of existence.

CROSSLISTED: PHIL 3851.03

FORMATS: Lecture | Discussion

### **PHIL 5855 Topics in Metaphysics**

CREDIT HOURS: 3

In this seminar course, students focus on a particular topic in Metaphysics and investigate it in detail. When the course is offered, the topic is assigned by the Department at the end of the preceding academic year and is then posted at the Department and in the Faculty's timetable on the Web.

CROSSLISTED: PHIL 4855.03

FORMATS: Seminar

### **PHIL 9000 MA Thesis**

CREDIT HOURS: 0

## **PHIL 9530 PhD Thesis**

CREDIT HOURS: 0

# **Physics and Atmospheric Science**

Location:

Sir James Dunn Science Building

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2337

Fax Number: (902) 494-5191

Email Address: [physics@dal.ca](mailto:physics@dal.ca)

Website: [www.physics.dal.ca](http://www.physics.dal.ca)

## **Introduction**

The Department of Physics and Atmospheric Science offers Masters and Doctoral degree programs in physics, as well as Masters, Doctoral and Certificate programs in medical physics.

Research in physics has an interdisciplinary approach with major activities in: Atmospheric Science, Biophysics, Condensed Matter Physics, Materials Science, Surface Science, Photonics, and Computational Physics and involves collaborations with other units such as Biomedical Engineering, Chemistry, Mathematics, Medicine, and Oceanography, as well as government and industrial laboratories. Research facilities include a large array of sample preparation and analytical tools as well as extensive computational facilities.

Research avenues in medical physics include precision radiotherapy and radio surgical techniques in the treatment of cancer patients, image guidance, and innovation in magnetic resonance and nuclear medicine imaging. Graduate students may conduct their work in state-of-the art hospital treatment and imaging facilities and within dedicated laboratories. Coursework in medical physics meet the standards defined by the Commission on Accreditation of Medical Physics Education Programs (CAMPEP).

The most up-to-date information about our graduate programs, admission requirements, academic regulations, graduate courses and research activities is available at our website [www.physics.dal.ca](http://www.physics.dal.ca)

## **Staff**

### **Chairperson of Department**

Hill, Ian (902) 494-2218

### **Graduate Coordinator**

Monchesky, T. L. (902) 494-3582 [theodore.monchesky@dal.ca](mailto:theodore.monchesky@dal.ca)

### **Coordinator, Atmospheric Science**

Chang, R. (902) 494-2832

### **Coordinator, Diploma in Meteorology**

Folkins, I. (902) 494-1292

### **Coordinator, Co-op Program**

Labrie, D. (902) 494-2322

### **Professors Emeriti**

**Drummond, J.R.,** BA, MA PhD (Oxford) FRSC-Canada Research Chair, Remote Sounding Atmosphere  
**Dunlap, R.A.,** BS (Worcester), AM (Dartmouth), PhD (Clark) - Research  
**Jericho, M. H.,** BSc, MSc (Dalhousie), PhD (Cantab), FRSC  
**Kreuzer, H. J.,** MSc, DSc (Bonn), FRSC, A.C. Fales Professor of Theoretical Physics  
**Stroink, G.,** BSc, MSc (Delft), PhD (McGill), PEng

## **Professors**

**Beyea, S.,** BSc, PhD (UNB), primary appointment in the Department of Diagnostic Radiology  
**Dahn, J. R.,** BSc (Dalhousie), MSc, PhD (UBC), FRSC, NSERC/3M Canada Inc. Industrial Research Chair, Canada Research Chair in Materials for Batteries and Fuel Cells, cross appointment with Chemistry, cross appointment with Process Engineering and Applied Science  
**Drummond, J. R.,** BA, MA, PhD (Oxford), FRSC-Canada Research Chair, Remote Sounding of Atmospheres  
**Dunlap, R. A.,** BS (Worcester), AM (Dartmouth), PhD (Clark) - Research  
**Geldart, D. J. W.,** BSc (Acadia), PhD (McMaster), FRSC - Research  
**Hall, K. C.,** MSc, PhD (Toronto), Canada Research Chair in Ultra-Fast Science  
**Hewitt, K.,** BSc (Toronto), PhD (Simon Fraser), PPHYS  
**Hill, I. G.,** BSc, PhD (Queen's)  
**Johnson, E.R.,** BSc(Carleton), PhD (Queen's)  
**Kreplak, L.,** MSc (Supelec), PhD (Univ Paris XI)  
**Martin, R. V.,** BS (Cornell), MSc (Oxford), MS, PhD (Harvard), cross appointment with Environmental Programs, Chemistry, Arthur B. MacDonald Chair  
**Monchesky, T. L.,** BAsC (Toronto), PhD (Simon Fraser)  
**Rotermund, H. H.,** PhD (Berlin), George Munro Professor of Physics  
**Rutenberg, A. D.,** BSc (Toronto), PhD (Princeton)  
**Zwanziger, J. W.,** BA (Chicago), PhD (Cornell), Canada Research Chair in NMR Studies of Materials, primary appointment with Chemistry

## **Associate Professors**

**Duck, T.,** BSc, PhD (York)  
**Folkins, I.,** BSc (Dalhousie), MSc, PhD (Toronto)  
**Kyriakidis, J.,** BSc, MSc (Dalhousie), PhD (Basel)  
**Labrie, D.,** BSc (Montreal), MSc, PhD (McMaster)  
**Lesins, G.B.** PhD (Toronto)  
**Maksym, G. N.,** PhD (McGill), primary appointment in the School of Biomedical Engineering  
**Robar, J.,** MSc (McGill), PhD (UBC), primary appointment with Radiation Oncology

## **Assistant Professors**

**Bardouille, T.,** BSc (Queens), MASc (Dalhousie), PhD (Toronto)  
**Bowen, C.,** PhD (UWO) Institute for Biodiagnostics, NRC  
**Chang, R. Y. W.,** BASc, MASc, PhD (Toronto)  
**Wells, S. M.,** BSc (Western), PhD (Toronto), joint appointment with Biomedical Engineering  
**Maassen, J.,** BEng, (Ecole Polytechnique), MASc (Ecole Polytechnique de Montreal), PhD (McGill)

## **Instructors**

**Payne, S. H.,** BSc, PhD (Canterbury)

## **Adjunct (FGS)**

**Bennett, C.,** PhD (Waterloo), Physics, Acadia University  
**Grabtschak, S.,** PhD (UPEI)  
**Hornridge, D.,** PhD (Saskatchewan), Physics, Mount Allison University  
**Isaac, G.,** BSc, MSc, PhD (McGill)  
**Kanungo, R.,** PhD (Calcutta Univ), Astronomy and Physics, Saint Mary's University  
**Pierce, J.,** BS (Northeastern), PhD (Carnegie Mellon)  
**Ritchie, H. C.,** MSc, PhD (McGill), Meteorological Service of Canada-Atlantic  
**Robertson, M.,** PhD (Waterloo), Physics, Acadia University  
**Sarty, A.,** PhD (Saskatchewan), Astronomy and Physics, Saint Mary's University

## **Adjunct (Retired)**

**White, M. A.**, BSc (UWO), PhD (McMaster), FRSC, University Research Professor, primary appointment with Chemistry

## **Postdoctoral Fellows**

**Cakmakyapan, S.**, PhD (Bilkent)

**Cao, Y.**, PhD (Tsinghua)

**Chaubey, J.**, PhD (Kerala)

**Cheng, J.**, PhD (National Taiwan)

**Cooper, M.**, PhD (Dalhousie)

**Croft, B.**, PhD (Dalhousie)

**DeBay, D.**, PhD (Dalhousie)

**Genovese, M.**, PhD (Toronto)

**Hammer, M.**, PhD (Dalhousie)

**McDuffie, E.**, PhD (Colorado)

**Monfared, Y.**, PhD (Dalhousie)

**Nagare, B.**, PhD (ETH Zurich)

**Song, W.**, PhD (Maryland)

**Sosa, P.**, PhD (Glasgow)

**Tamang, A.**, PhD (Jacobs)

**Tom, J.**, PhD (Dalhousie)

**Vaeli, R.**, PhD (Tartu)

**Valitova, I.**, PhD (Ecole Polytechnique de Montreal)

**Weagle, C.**, PhD (Dalhousie)

**Xu, J.**, PhD (Dalhousie)

## **Admission Requirements**

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. An MSc is the normal admission requirement for the PhD program. It is recommended that all international students provide the Department with an official copy of the Advanced Graduate Record Examination in Physics. In some cases, this will be made a precondition to consideration of the student's application for admission.

## **Master of Science (MSc)**

For minimum time required to complete this program, see the [Faculty of Graduate Studies Regulation 1.3.1](#).

At least 12 credit hours are normally required.

Research, preparation, and oral defense of a thesis are required.

## **Doctor of Philosophy (PhD)**

For minimum time required to complete this program, see the [Faculty of Graduate Studies regulations](#).

At least nine credit hours are normally required, and additional courses may be specified by supervisory committees.

A preliminary oral examination must be completed successfully.

Research and the preparation and oral defense of a thesis are required.



The PhD degree will be granted primarily on the basis of the candidate's ability to carry through original investigation. Part of the evidence of this will be acceptance of scientific material for publication in refereed journals and the preparation of a satisfactory thesis.

## Medical Physics

The Medical Physics MSc and PhD programs in the Department of Physics and Atmospheric Science aim to provide complete didactic education in medical physics with a strong focus on research. Graduates will be prepared to enter clinical residency training programs in medical physics or to pursue research and academic careers in the field. The specific objectives of the MSc and PhD programs in Medical Physics are:

1. Through comprehensive coursework, to provide broad-based educational foundations in physics as applied to medicine that meet or exceed standards set by the Commission on Accreditation of Medical Physics Education Programs (CAMPEP, [www.campep.org](http://www.campep.org)). This training will prepare graduates for subsequent career development in clinical medical physics or related research.
2. To provide rich and in-depth experiences conducting innovative research and development, ultimately preparing students to become independent and motivated researchers. The academic plan allows for focus on thesis research following coursework. Thesis research provides the skills, knowledge and capacity for independent thought required to pursue further research, but also transferrable, analytic approaches to solving problems.
3. To provide a clear understanding of the possible career options as well as corresponding requirements, knowledge of professional aspects of medical physics, ethics, and effective interpersonal communication.
4. To allow graduates to be highly competitive for entry into clinical residency training programs in Medical Physics. While the approach is to defer clinical training to the Residency stage, students have options of pursuing research that is immediately translatable and highly relevant to clinical service.

### Certificate Program in Medical Physics

The Certificate program in Medical Physics is designed to provide one year of didactic coursework to candidates who hold a PhD in physics, in an area other than medical physics. The curriculum addresses CAMPEP standards.

### Description of Facilities

In completing their thesis research, graduate students in Medical Physics access advanced platforms for medical imaging, delivery of radiation therapy and radiosurgery, and associated clinical and experimental apparatus. Resources at Capital Health include seven state-of-the-art clinical linear accelerators, image-guidance and robotics systems, brachytherapy after loaders, grid computing resources, various radiation detectors as well as CT, PET/CT, and MRI imaging systems.

### Admission Requirements

For the **MSc degree in Medical Physics** the requirements are:

1. Completion of a four-year Bachelor degree (for MSc) in Physics or Engineering Physics granted by a university in recognized standing;
2. A minimum cGPA of 3.0; and
3. Where required, English proficiency as evidenced by internet based TOEFL score of 92, written TOEFL score of 580 or IELTS score of 7.0.

For the **PhD degree in Medical Physics** the requirements are:

1. Completion of a first-class thesis-based Masters degree or equivalent (for PhD) in physics or medical physics granted by a university in recognized standing;
2. A minimum cGPA of 3.0; and
3. Where required, English proficiency as evidenced by internet based TOEFL score of 92, written TOEFL score of 580 or IELTS score of 7.0.

For the **Certificate program in Medical Physics** the requirements are:

1. Completion of a PhD in physics granted by a university in recognized standing. Normally the specialization of the PhD will be in a branch of physics other than medical physics.

## Degree Requirements

The MSc program is a 2-year program. Graduation requirements are:

1. Completion of core medical physics graduate courses:
  - PHYC 6400: Medical Imaging Physics (Part I)
  - PHYC 6410: Medical Imaging Physics (Part II)
  - PHYC 6416: Seminars in Medical Physics
  - PHYC 6421: Radiological Physics
  - PHYC 6423: Radiation Therapy Physics
  - PHYC 6424: Special Topics in Medical Physics
  - PHYC 6430: Radiation Biology
  - PHYC 6431: Radiation Safety and Protection in Medicine
  - PHYC 6450: Computational Methods in Medical Physics
2. Completion of research-based MSc thesis (PHYC 9000); and
3. Successful thesis defense.

The PhD program is nominally a 4-year program. Graduation requirements are:

1. Completion of core medical physics graduate courses:
  - PHYC 6400: Medical Imaging Physics (Part I)
  - PHYC 6410: Medical Imaging Physics (Part II)
  - PHYC 6416: Seminars in Medical Physics
  - PHYC 6421: Radiological Physics
  - PHYC 6423: Radiation Therapy Physics
  - PHYC 6424: Special Topics in Medical Physics
  - PHYC 6430: Radiation Biology
  - PHYC 6431: Radiation Safety and Protection in Medicine
  - PHYC 6450: Computational Methods in Medical Physics

*\*The PhD program requires one year of core courses and, typically, three years of thesis research. Students who have completed the above courses during their MSc in Medical Physics at Dalhousie University may apply for Advanced Placement during their first academic term to have some or all of these requirements waived. PhD candidates from other institutions may need to take additional courses. Our courses provide students with the medical physics foundations specified within the Commission on Accreditation of Medical Physics standards.*
2. Completion of PHYC 9520: Preliminary Doctoral Examination;
3. Completion of research-based PhD thesis (PHYC 9530); and
4. Successful thesis defense.

## Certificate requirements

The Certificate program is a 1-year program. Graduation requirements are:

1. Completion of core medical physics graduate courses:
  - PHYC 6400: Medical Imaging Physics (Part I)
  - PHYC 6410: Medical Imaging Physics (Part II)
  - PHYC 6416: Seminars in Medical Physics
  - PHYC 6421: Radiological Physics
  - PHYC 6423: Radiation Therapy Physics
  - PHYC 6424: Special Topics in Medical Physics
  - PHYC 6430: Radiation Biology
  - PHYC 6431: Radiation Safety and Protection in Medicine
  - PHYC 6450: Computational Methods in Medical Physics

# Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

5000-level courses are fourth-year undergraduate courses which may be taken for graduate credit in certain circumstances. They are normally taken by new graduate students having background deficiencies in specific areas. 6000-level courses are full graduate courses.

All graduate students are required to attend and participate in regular departmental seminars.

A selection of the following graduate courses will be offered subject to demand.

## Course Descriptions

### **MEDP 6400 Medical Imaging Physics (Part I)**

CREDIT HOURS: 3

This course is the first of a two-part Medical Imaging Physics course. In this course students become familiar with the fundamental science of medical imaging systems. Topics covered include X-ray radiography imaging, linear systems, signal and noise transfer theories, and the physics and applications of computed tomography (CT).

COREQUISITES: PHYC 6421.03 or MEDP 6421.03

CROSSLISTED: PHYC 6400.03

FORMATS: Lecture

### **MEDP 6410 Medical Imaging Physics (Part II)**

CREDIT HOURS: 3

This course is the second of a two-part Medical Imaging Physics course that introduces a variety of medical imaging methodologies such as Nuclear Medicine Imaging, Magnetic Resonance Imaging (MRI), and Ultrasound (US). Various topics such as the fundamental physics, hardware, specialized techniques, image quality, and safety will be covered. Additional topics include advanced applications such as vascular and cardiac imaging techniques.

PREREQUISITES: PHYC 6400.03 or MEDP 6400.03

CROSSLISTED: PHYC 6410.03

RESTRICTIONS: Graduate students

FORMATS: Lecture

### **MEDP 6416 Seminars in Medical Physics**

CREDIT HOURS: 0

A seminar in various topics of medical physics. Students will be required to present journal articles from the field of medical physics and participate in the subsequent discussion. This course will allow the students to develop their presentation, discussion, and critical appraisal skills.

PREREQUISITES: MEDP 6424.03

CROSSLISTED: PHYC 6416.00

FORMATS: Seminar

### **MEDP 6421 Radiological Physics**

CREDIT HOURS: 3

The material in this course is designed to teach a graduate in physics (or engineering, with strong physics and math) the basics of radiological physics and dosimetry. Quantities and units are introduced early so that radioactive decay and radiation interactions can then be discussed, with emphasis on energy transfer and dose deposition. Exponential attenuation under both narrow and broad-beam conditions must be understood before a student can go on a

shielding design in a health physics course.

CROSSLISTED: PHYC 6421.03

FORMATS: Lecture

### **MEDP 6423 Radiation Therapy Physics**

CREDIT HOURS: 4

The course covers ionizing radiation generation and use in radiation therapy to cause controlled biological effects in cancer patients. Topics include external beam radiation therapy, brachytherapy, treatment planning, radiation therapy devices, special techniques in radiotherapy, radiation therapy with neutrons, protons, and heavy ions.

PREREQUISITES: PHYC 6421.03 or MEDP 6421.03

CROSSLISTED: PHYC 6423.04

FORMATS: Lecture

### **MEDP 6424 Special Topics in Medical Physics**

CREDIT HOURS: 3

This course covers topics in Medical Physics that are not covered in other courses, including: safety; introduction to medical linear accelerations; bioethics; professional ethics; conflict of interest; scientific misconduct; clinical research; anatomy and physiology; grant writing; intellectual property; statistics; and scientific communications.

CROSSLISTED: PHYC 6424.03

FORMATS: Lecture | Seminar

### **MEDP 6430 Radiation Biology**

CREDIT HOURS: 3

Radiobiology topics include: basic physical and chemical mechanisms, cellular radiation biology, mechanisms of cancer induction, the effects of radiation on normal tissues and malignant cells, and competing treatment modalities. Radiation protection and health physics topics include: risk versus benefit, radiation shielding properties and design, and radiation monitoring of personnel.

PREREQUISITES: Permission of instructor

CROSSLISTED: PHYC 6430.03

FORMATS: Lecture

### **MEDP 6431 Radiation Safety and Protection in Medicine**

CREDIT HOURS: 3

This course is concerned with the hazards of ionizing and non-ionizing radiations and with safe handling and use of radiation sources. Covered are: basic principles; safety codes; laws and regulations; organization; shielding design; and practical safety measures and procedures.

PREREQUISITES: (PHYC 6421.03 or MEDP 6421.03) and (PHYC 6430.03 or MEDP 6430.03)

CROSSLISTED: PHYC 6431.03

FORMATS: Lecture

### **MEDP 6450 Computational Methods in Medical Physics**

CREDIT HOURS: 3

This course offers an introduction to established and emerging computational methods in radiation therapy physics, with emphasis on modeling of radiation dose deposition. Topics include empirical, analytic and Monte Carlo methods for dose calculation, as well as image co-registration and treatment planning. Weekly lectures are followed by practical laboratory assignments.

PREREQUISITES: Permission of instructor

CROSSLISTED: PHYC 6450.03

FORMATS: Lecture | Lab

### **MEDP 9000 Master's Thesis**

CREDIT HOURS: 0

**MEDP 9520 Preliminary Doctoral Exam**

CREDIT HOURS: 0

**MEDP 9530 Doctoral Thesis**

CREDIT HOURS: 0

**PHYC 5100 Electromagnetism**

CREDIT HOURS: 3

Topics will normally include electrostatics and magnetostatics, boundary value problems, fields in matter, time-dependent phenomena. Maxwell's equations, electromagnetic waves, radiation.

PREREQUISITES: PHYC 2510.03, 4160.03; MATH 3110.03/3120.03; or the permission of the instructor

FORMATS: Lecture

**PHYC 5151 Quantum Physics II**

CREDIT HOURS: 3

This course is a continuation of PHYC 3640.03. Topics include: time-independent perturbation theory, the variational principle, the WKB approximation, time-dependent perturbation theory, scattering, Born approximation.

PREREQUISITES: PHYC 3640.03

**PHYC 5160 Mathematical Methods of Physics**

CREDIT HOURS: 3

Topics discussed include: complex variable theory, Fourier and Laplace transform techniques, special functions, partial differential equations.

PREREQUISITES: PHYC 2140.03, MATH 3120.03 or permission of the instructor

FORMATS: Lecture

**PHYC 5170 Topics in Mathematical Physics**

CREDIT HOURS: 3

This course is a continuation of PHYC 5160.03 and deals with special topics in mathematical physics selected from areas such as the Green's function technique for solving ordinary and partial differential equations, scattering theory and phase shift analysis, diffraction theory, group theory, tensor analysis, and general relativity.

PREREQUISITES: PHYC 5160.03, or permission of the instructor

FORMATS: Lecture

**PHYC 5180 Nuclear and Particle Physics**

CREDIT HOURS: 3

This is an introductory course in nuclear physics. Topics discussed include: nucleon-nucleon interactions, nuclear structure, gamma transitions, alpha decay, beta decay, nuclear reactions and elementary particle physics.

PREREQUISITES: PHYC 3640.03 or permission of the instructor

FORMATS: Lecture

**PHYC 5230 Introduction to Solid State Physics**

CREDIT HOURS: 3

An introduction to the basic concepts of solid-state physics which are related to the periodic nature of the crystalline lattice. Topics include crystal structure, X-ray diffraction, phonons and lattice vibrations, the free electron theory of metals, and energy bands.

PREREQUISITES: PHYC 3640.03, PHYC 3210.03, or permission of the instructor

FORMATS: Lecture

### **PHYC 5250 Topics in Numerical Computing**

CREDIT HOURS: 3

This class focuses on discrete and stochastic techniques of computational physics. Topics may include stochastic methods, global optimization techniques, spectral methods, linear algebra, correlations, and computational modelling.

PREREQUISITES: PHYC 1280.03/1290.03 or equivalent, MATH 1010.03 or equivalent, PHYC 3210.03 (Statistical Physics) or equivalent. A laptop and some familiarity with the command line is helpful.

EXCLUSIONS: PHYC 4250

FORMATS: Lecture

### **PHYC 5311 Fluid Dynamics**

CREDIT HOURS: 3

An introduction to the theory of fluid dynamics with some emphasis on geophysically important aspects. Topics include kinematics, equations of motion, viscous flow, potential flow, and basic aerodynamics.

PREREQUISITES: Permission of the instructor

CROSSLISTED: OCEA 5311.03

FORMATS: Lecture

### **PHYC 5330 Crystallography and Physical Properties**

CREDIT HOURS: 3

The course covers an introduction to space groups, single crystal diffraction, powder x-ray and neutron diffraction as well as Rietveld profile refinement methods. The impact of structure on physical properties of solids will be examined. There will be hands-on experimental activities in addition to lectures.

PREREQUISITES: PHYC 3140.03 or permission of the instructor

FORMATS: Lecture

### **PHYC 5411 Atmospheric Dynamics I**

CREDIT HOURS: 3

The basic laws of fluid dynamics are applied to studies of atmospheric motion, including the atmospheric boundary layer and synoptic scale weather disturbances (the familiar highs and lows on weather maps). Emphasis will be placed on the blend of mathematical theory and physical reasoning which leads to the best understanding of the dominant physical mechanisms.

PREREQUISITES: Permission of the instructor

CROSSLISTED: OCEA 5411.03

FORMATS: Lecture

### **PHYC 5412 Atmospheric Dynamics II**

CREDIT HOURS: 3

The approach is the same as for PHYC 5411.03, with emphasis on synoptic-scale wave phenomena, frontal motions, and the global circulation. Additional topics including tropical meteorology, middle atmospheric dynamics, severe storms, mesoscale meteorology and numerical weather prediction may be included.

PREREQUISITES: PHYC 5411.03, or permission of the instructor

CROSSLISTED: OCEA 5412.03

FORMATS: Lecture

### **PHYC 5460 Advanced Optics**

CREDIT HOURS: 3

This course covers a selection of topics in advanced optics, that may include: a quantum treatment of light-matter interactions, strong field effects, quantum optics, nonlinear optics, optical resonators, laser physics, laser dynamics, and photonic devices.

CROSSLISTED: PHYC 4460.03

FORMATS: Lecture

### **PHYC 5505 Atmospheric Physics**

CREDIT HOURS: 3

Moist thermodynamics is applied to a variety of atmospheric phenomenon. These include aerosols, cloud droplets, precipitation formation, convection, supercells, hurricanes, lightning, and the boundary layer. We also discuss the radar equation and the interpretation of radar images.

PREREQUISITES: PHYC 5520 or permission of the instructor

CROSSLISTED: OCEA 5505.03, PHYC 4505.03, OCEA 4505.03

FORMATS: Lecture

### **PHYC 5520 Introduction to Atmospheric Science**

CREDIT HOURS: 3

This general overview of the atmosphere provides the student with an understanding of the composition and thermal structure of the atmosphere, air mass and frontal theory and weather generating physical processes and their consequences. Other topics include atmospheric radiation, dynamic meteorology, climatology and the physics of clouds and storms.

PREREQUISITES: At least one 3rd year physics course or permission of the instructor

CROSSLISTED: OCEA 5520.03

FORMATS: Lecture

### **PHYC 5540 Synoptic Meteorology I**

CREDIT HOURS: 3

This course introduces the practical skills of meteorological observation and analysis. Emphasis is on developing skills in drawing and interpreting weather maps, and on studying the three-dimensional structure of weather systems. Satellite and radar remote sensing of the atmosphere is also introduced. Case studies of atmospheric systems and processes are carried out during the tutorial-laboratory period.

PREREQUISITES: At least 1 third-year physics course

CROSSLISTED: OCEA 5541.03, PHYC 4540.03

FORMATS: Lecture | Lab | Tutorial

### **PHYC 5550 Synoptic Meteorology II**

CREDIT HOURS: 3

This course extends the analysis and diagnosis of atmospheric dynamics and weather processes introduced in PHYC 4540.03. Emphasis is on the practical application of meteorological theory, particularly in the area of diagnosing the cases of weather events. Modern computer and statistical methods are discussed, and students receive an introduction to weather forecasting.

PREREQUISITES: PHYC 5540.03

CROSSLISTED: OCEA 5550.03, PHYC 4550.03

FORMATS: Lecture | Lab | Tutorial

### **PHYC 5570 Light Scattering, Radiative Transfer, and Remote Sensing**

CREDIT HOURS: 3

The equations of radiative transfer are developed and applied to the interaction of solar and terrestrial radiation with molecules, aerosols, and clouds in the atmosphere. Emphasized topics include satellite remote sensing, scattering and absorption, and the Earth radiation budget.

CROSSLISTED: OCEA 5570.03

### **PHYC 5595 Atmospheric Chemistry**

CREDIT HOURS: 3

A fundamental introduction to the physical and chemical processes determining the composition of the atmosphere and its implications for climate, ecosystems, and human welfare. Origin of the atmosphere. Nitrogen, oxygen, carbon, sulfur cycles. Climate and the greenhouse effect. Atmospheric transport and turbulence. Stratospheric ozone. Oxidizing power of the atmosphere. Regional air pollution: aerosols, smog, acid rain.

CROSSLISTED: OCEA 5595.03, PHYC 4595.03, OCEA 4595.03

FORMATS: Lecture

### **PHYC 5650 General Relativity**

CREDIT HOURS: 3

A review of differential geometry will be given followed by an introduction to the general theory of relativity. Various topics will be discussed, including: linearized theory and gravitational radiation, spherically symmetric metrics and the Schwarzschild Solution, gravitational collapse, black holes, and cosmology.

PREREQUISITES: MATH 3050.06 or permission of the instructor

CROSSLISTED: MATH 5650.03

FORMATS: Lecture

**PHYC 5660 Cosmology**

CREDIT HOURS: 3

A self-contained introduction to cosmology will be given and no prior knowledge of differential geometry of general relativity will be assumed (although some knowledge or elementary differential equations will be useful). A cosmological model is a model of the universe, as a whole, on the largest scales; the emphasis of the course will be on the modelling aspects of cosmology.

PREREQUISITES: Permission of the instructor

CROSSLISTED: MATH 5410.03

FORMATS: Lecture

**PHYC 6121 Quantum Theory**

CREDIT HOURS: 3

Selected topics in quantum mechanics: field theoretic and computational techniques.

PREREQUISITES: PHYC 4151.03 and 4152.03, or permission of the instructor

FORMATS: Lecture

**PHYC 6201 Solid State Physics**

CREDIT HOURS: 3

Topics covered include crystal structures, reciprocal lattices, space groups, x-ray scattering, Debye scattering formalism, lattice vibrations, phonon dispersion, specific heat of solids, electronic structure, free electron model and nearly-free electron model.

PREREQUISITES: PHYC 4151.03 and 4230.03, or permission of the instructor

FORMATS: Lecture

**PHYC 6202 Solid State Physics II**

CREDIT HOURS: 3

This course is a continuation of PHYC 6201.03 and covers the physical properties of solids at a more advanced level.

PREREQUISITES: PHYC 6202.03

FORMATS: Lecture

**PHYC 6203 Soft Matter**

CREDIT HOURS: 3

Soft-matter physics focuses on self-assembled materials in which entropic effects are strong. These materials are typically mechanically soft and dynamic and have tunable properties. They are enormously important in industry, in the lab, and in nature. Canonical examples that we will consider include polymers, surfaces, random walks, and liquid crystals. They are the materials relation of statistical mechanics and statistical physics, and the entropic relation of condensed matter physics and materials science. This course introduces soft-matter systems, but also calculational approaches towards them. Physical examples and simple models will be discussed throughout the course

PREREQUISITES:

FORMATS: Lecture

**PHYC 6225 Topics in Condensed Matter Physics**

CREDIT HOURS: 1.5

This course explores current research topics in condensed matter research. Topics vary according to student interests and the current literature, but could include graphene, topological insulators, organic electronics, dilute magnetic semiconductors, and new-high T<sub>c</sub> superconductors.

PREREQUISITES: PHYC 5230 or permission of the instructor

FORMATS: Lecture

**PHYC 6226 Microstructures in Condensed Matter**

CREDIT HOURS: 1.5

This course will develop models to describe the self-assembled microstructures that are observed in condensed matter systems. It will focus will largely focus on a description of liquid crystals and ferromagnetism in terms of a classical continuum theory. The goal is to provide students with a deeper understanding of textures in the classical fields that describe condensed matter systems.



### **PHYC 6230 Nanophotonics: Principles and Applications**

CREDIT HOURS: 3

Introduction to a multidisciplinary field covering the following topics: near-field interactions and microscopy, quantum-confined materials, plasmonics, photonic crystals, nanoparticles, nanofabrication and characterization, applications of nanophotonics, sensors, nano-biophotonics, nanoparticles in light-activated therapy and optical imaging modalities.

PREREQUISITES: Ant of the following: PHYC 3540, ECED 3300, ECED 4421, MICI/BIOL 3024, or permission of the instructor

FORMATS: Lecture

### **PHYC 6250 Experimental Techniques in Material Science**

CREDIT HOURS: 3

An introduction to six experimental techniques used in materials science will be given. Examples of techniques that may be covered include x-ray diffraction, x-ray photoelectron spectroscopy, Raman spectroscopy, Mössbauer spectroscopy, neutron diffraction, nuclear magnetic resonance.

PREREQUISITES: PHYC 3640.03, 3210.03, 4230.03, or permission of the instructor

FORMATS: Lecture

### **PHYC 6261 Statistical Mechanics I**

CREDIT HOURS: 3

Statistical mechanics describes the equilibrium properties of systems. Really it is about how to model properties of soft systems in the face of fluctuations. We will start with a review of the basic formalism, then discuss mean-field theories, critical phenomenon, diffusion, and stochastic models. Depending on interest and time, we may also discuss topological defects, non-equilibrium phenomenon, and computational techniques. Physical examples and simple models will be discussed throughout the course.

PREREQUISITES: PHYC 3210.03 and 4151.03, or permission of the instructor

FORMATS: Lecture

### **PHYC 6301 Electrodynamics I**

CREDIT HOURS: 3

Topics will normally include: boundary-value methods for problems in electrostatics and magnetostatics, multipolar expansions for the electrostatic and magnetostatic fields, Maxwell equations, plane electromagnetic waves and wave propagation in a variety of media, reflection and transmission of electromagnetic waves at an interface, simple radiating systems, elementary Mie scattering theory.

PREREQUISITES: PHYC 4110.03, or permission of the instructor

FORMATS: Lecture

### **PHYC 6400 Med. Img. Physics (Part I)**

CREDIT HOURS: 3

This course is the first of a two-part Medical Imaging Physics course. In this course students become familiar with the fundamental science of medical imaging systems. Topics covered include X-ray radiography imaging, linear systems, signal and noise transfer theories, and the physics and applications of computed tomography (CT).

COREQUISITES: PHYC 6421.03 or MEDP 6421.03

CROSSLISTED: MEDP 6400.03

FORMATS: Lecture

### **PHYC 6401 Fundamentals on Nonlinear Optics**

CREDIT HOURS: 3

Introduction covering the following topics: nonlinear refractive index, nonlinear wave equations, some indifference frequency generation, second harmonic generation, optical solitons and their propagation in nonlinear fibres, resonant matter interaction, self-induced transparency, electromagnetically induced transparency, quantum theory of nonlinear optical susceptibility.

PREREQUISITES: ECED 3300 and ECED 4502 or equivalent; ENGM 2062 recommended; or instructor approval

CROSSLISTED: ECED 6400.03

### **PHYC 6416 Seminars in Medical Physics**

CREDIT HOURS: 0

A seminar in various topics of medical physics. Students will be required to present journal articles from the field of medical physics and participate in the subsequent discussion. This course will allow the students to develop their presentation, discussion, and critical appraisal skills.

PREREQUISITES: MEDP 6424.03

CROSSLISTED: MEDP 6416.00

FORMATS: Seminar

### **PHYC 6421 Radiological Physics**

CREDIT HOURS: 3

The material in this course is designed to teach a graduate in physics (or engineering, with strong physics and math) the basics of radiological physics and dosimetry. Quantities and units are introduced early so that radioactive decay and radiation interactions can then be discussed, with emphasis on energy transfer and dose deposition. Exponential attenuation under both narrow and broad-beam conditions must be understood before a student can go on a shielding design in a health physics course.

CROSSLISTED: MEDP 6421.03

FORMATS: Lecture

### **PHYC 6423 Radiation Therapy Physics**

CREDIT HOURS: 4

The course covers ionizing radiation generation and use in radiation therapy to cause controlled biological effects in cancer patients. Topics include external beam radiation therapy, brachytherapy, treatment planning, radiation therapy devices, special techniques in radiotherapy, radiation therapy with neutrons, protons, and heavy ions.

PREREQUISITES: PHYC 6421.03 or MEDP 6421.03

CROSSLISTED: MEDP 6423.04

FORMATS: Lecture

### **PHYC 6424 Special Topics in Medical Physics**

CREDIT HOURS: 3

This course covers topics in Medical Physics that are not covered in other courses, including: safety; introduction to medical linear accelerations; bioethics; professional ethics; conflict of interest; scientific misconduct; clinical research; anatomy and physiology; grant writing; intellectual property; statistics; and scientific communications.

CROSSLISTED: MEDP 6424.03

FORMATS: Lecture | Seminar

### **PHYC 6430 Radiation Biology**

CREDIT HOURS: 3

Radiobiology topics include: basic physical and chemical mechanisms, cellular radiation biology, mechanisms of cancer induction, the effects of radiation on normal tissues and malignant cells, and competing treatment modalities. Radiation protection and health physics topics include: risk versus benefit, radiation shielding properties and design, and radiation monitoring of personnel.

PREREQUISITES: Permission of instructor

CROSSLISTED: MEDP 6430.03

FORMATS: Lecture

### **PHYC 6431 Radiation Safety and Protection in Medicine**

CREDIT HOURS: 3

This course is concerned with the hazards of ionizing and non-ionizing radiations and with safe handling and use of radiation sources. Covered are: basic principles; safety codes; laws and regulations; organization; shielding design; and practical safety measures and procedures.

PREREQUISITES: (PHYC 6421.03 or MEDP 6421.03) and (PHYC 6430.03 or MEDP 6430.03)

CROSSLISTED: MEDP 6431.03

FORMATS: Lecture

### **PHYC 6440 Magnetic Resonance Imaging (MRI) Physics**

CREDIT HOURS: 3

The physics principles involved with Magnetic Resonance Imaging (MRI) will be introduced. Topics such as elementary NMR signal formation and detection,

nuclear interactions that produce image contrast/artifacts, introductory spin manipulation, MRI hardware, and advanced techniques in signal excitation, manipulation and reception will be discussed.

PREREQUISITES: Permission of instructor

FORMATS: Lecture

### **PHYC 6450 Computational Methods in Medical Physics**

CREDIT HOURS: 3

This course offers an introduction to established and emerging computational methods in radiation therapy physics, with emphasis on modeling of radiation dose deposition. Topics include empirical, analytic and Monte Carlo methods for dose calculation, as well as image co-registration and treatment planning. Weekly lecture are followed by practical laboratory assignments.

PREREQUISITES: Permission of instructor

CROSSLISTED: MEDP 6450.03

FORMATS: Lecture | Lab

### **PHYC 6560 Atmospheric Boundary Layers**

CREDIT HOURS: 1.5

A detailed mathematical description of atmospheric boundary layers. After developing the fundamental equations for turbulence, Monin-Obukov similarity theory is used to predict profiles and fluxes. Topics include surface properties, energy fluxes, convective and stable conditions, cloud-topped layers, tracer diffusion, time-dependent effects, and parameterizations for large scale models.

PREREQUISITES: Permission of instructor

FORMATS: Lecture

### **PHYC 6576 Topics in Atmospheric Physics**

CREDIT HOURS: 3

This course will focus on current research topics in atmospheric science. Fundamental theories of atmospheric science will be applied to selected topics.

PREREQUISITES: Permission of Instructor

FORMATS: Seminar | Discussion

### **PHYC 6580 Cloud Physics**

CREDIT HOURS: 3

A detailed examination of the behaviour of condensed water in the atmosphere. Topics include nucleation, hydrodynamics of cloud and precipitation particles, ice physics, mechanisms of precipitation formation, electrical and radiative properties. Cloud dynamics will include effects of latent heating feedback, thunderstorm structure, precipitation efficiency, mixed-phased storms and cloud models.

PREREQUISITES: Permission of the instructor

CROSSLISTED: OCEA 5580.03

FORMATS: Lecture

### **PHYC 6585 Advanced Remote Sensing**

CREDIT HOURS: 3

Topics involving the remote sensing of the atmosphere and surface using space and ground-based instrumentation and radiative transfer theory will be covered.

PREREQUISITES: Permission of Instructor

FORMATS: Lecture

### **PHYC 6600 Topics in Physics**

CREDIT HOURS: 3

Topics selected will depend on the current interests of the instructor and the students.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture

### **PHYC 6601 Topics in Physics**

CREDIT HOURS: 3

Topics selected will depend on the current interests of the instructor and the students.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture

### **PHYC 6602 Topics in Physics**

CREDIT HOURS: 3

Topics selected will depend on the current interests of the instructor and the students.

PREREQUISITES: Permission of the instructor

FORMATS: Lecture

### **PHYC 6801 Physics and Atmospheric Science MSc Seminar Series**

CREDIT HOURS: 0

The goal of this course is to develop the students' oral presentation skills — a critical component of their education. Students are required to give one seminar per year to their peers on a topic related to their field of study. The student will register for the course each year and will receive a pass/fail grade for the course in the final year of their program. The class will nominally meet weekly in the Fall and Winters terms.

CALENDAR NOTES: This course is taught together with PHYC 6802. MSc students register for PHYC 6801, and PhD students register for PHYC 6802.

FORMATS: Seminar

### **PHYC 6802 Physics and Atmospheric Science PhD Seminars**

CREDIT HOURS: 0

The goal of this course is to develop the students' oral presentation skills — a critical component of their education. Students are required to give one seminar per year to their peers on a topic related to their field of study. The student will register for the course each year and will receive a pass/fail grade for the course in the final year of their program. The class will nominally meet weekly in the Fall and Winters terms.

CALENDAR NOTES: This is taught together with PHYC 6801. MSc students register for PHYC6801; PhD students enroll in PHYC6802.

FORMATS: Seminar

### **PHYC 9000 MSc Thesis**

CREDIT HOURS: 0

### **PHYC 9520 Prelim Doctoral Exam**

CREDIT HOURS: 0

### **PHYC 9530 PhD Thesis**

CREDIT HOURS: 0

## **Physiology and Biophysics**

Location:

Sir Charles Tupper Medical Building

5850 College Street

Room 3-B1

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3517  
Fax Number: (902) 494-1685  
Email Address: [graduate.physiology@dal.ca](mailto:graduate.physiology@dal.ca)  
Website: [www.dal.ca/academics/graduate\\_programs/physiology-and-biophysics.html](http://www.dal.ca/academics/graduate_programs/physiology-and-biophysics.html)

## Staff

**Head of Department**  
**Cowley, E.A.**

**Graduate Coordinator**  
**Quinn, T.A.**

## Professors

**Brown, R. E.**, BSc (Victoria), MA, PhD (Dalhousie), major appointment in Department of Psychology and Neuroscience. Olfaction; hormones, parental behaviours; learning and memory; developmental psychobiology; psychopharmacology

**Chappe, V.**, BSc (Univ Aix-Marseille), MSc, PhD (Université de Provence-Marseille, France). Structure, function, recycling, and regulation of the CFTR chloride channels; Cystic Fibrosis causing mutations; second messengers; protein kinases; protein interactions; receptors and signalling pathways.

**Chauhan, B.**, PhD (Wales), major appointment Department of Ophthalmology and Visual Sciences. Experimental models of optic nerve and retinal damage, visual function in health and disease, structural and functional assessment of glaucoma, risk factors for the progression of glaucoma

**Cowley, E. A.**, BSc (London), PhD (Leicester). Oxidative stress in lung disease. Role of K<sup>+</sup> channels in transepithelial secretion

**Croll, R. P.**, BSc (Tufts), PhD (McGill). Physiology and functional anatomy of invertebrate nervous systems; analyses of motor program generation; regeneration, development, and evolution of identified neurons

**Fine, A.**, AB (Harvard), VMD, PhD (Penn). Neural plasticity; learning and memory, development, and regeneration; optical monitoring of neural activity and plasticity; neural transplantation

**French, A. S.**, MSc, PhD (Essex). Sensory transduction and adaptation; epithelial ion transport; ion channel biophysics

**Lehmann, C.**, MD, PhD (Humboldt-Univ, Germany), FRCDC (Dalhousie), major appointment with Department of Anesthesia, Pain Management and Perioperative Medicine

**Linsdell, P.**, BSc (London), PhD (Leicester). Ion channel biophysics; chloride channel structure and function; epithelial transport; cystic fibrosis

**Meinertzhagen, I. A.**, BSc (Aberdeen), PhD (St. Andrews), major appointment in Department of Psychology and Neuroscience. Neurobiology of simple nervous systems, particularly the visual system in *Drosophila*: neural development and plasticity

**Torkkeli, P. H.**, BSc, MSc, LcSc (Oulu), PhD (Alta). Mechanosensitive, voltage- and ligand-gated ion channels in mechanosensory neurons, central control of mechanosensation

**Wang, J.**, BS (Nanjing Medical College), MA (Nanjing Railway Medical College), MA, PhD (SUNY), major appointment in School of Human Communication Disorders. Central auditory and cochlear physiology/pathology

## Associate Professors

**Anini, Y.**, PhD (Paris, France), Prohormones processing. Role of new enteric peptides and adipokines in the regulation of pancreatic secretions and adipogenesis. Hormonal regulation of energy homeostasis. Type 2 diabetes. Obesity

**Dong, X.**, PhD (Univ Sci Tech, China). Ion channel biophysics; lysosomal ion channels in endocytosis, phagocytosis, autophagy, calcium signaling, and iron homeostasis; lysosomal ion channels in lysosomal storage diseases, neurodegenerative diseases, and ischemia/stroke

**Krueger, S.**, PhD (Zurich). Synaptic physiology; development and plasticity of synapses in the central nervous system; regulation of neurotransmitter release

**Quinn, T.A.**, PhD (Columbia, New York). Cardiac mechanics, electrophysiology, and mechano electric coupling; cardiac arrhythmogenesis and disease; optimisation of device-based therapies; *in vivo* and isolated heart/tissue/cell structure-function studies; computational modelling.

**Tremblay, F.**, BSc, PhD (Montréal), major appointment, Department of Ophthalmology and Visual Sciences. Neurobiology of vertebrate retina, neuroprotection

## Assistant Professor

**El Hiani, Y.**, BSc (Ibn Zohr, Morocco), MSc, PhD (UPJV, Amiens-France). Oxidative stress in breast cancer and opportunities for pharmacological intervention. Membrane electrophysiology, ion channel biophysics and structure function; transient receptor potential channels, calcium channels; calcium influx; calcium signaling)

### **Adjunct (FGS)**

**Baratte, J.**, MSc, PhD (Univ Pierre et Marie Curie, Paris)

Information on research interests in the Department and openings for graduate and post-PhD or post-MD study should be requested from the Graduate Coordinator of the Department.

## **Admission Requirements**

General requirements for admission to the Faculty of Graduate Studies are given in the Faculty Regulations section of this calendar. A paper-based TOEFL score of at least 600 (computer-based TOEFL score of at least 250) is required of applicants whose native language is not English (see [Faculty of Graduate Studies regulations](#)). We also accept IELTS Academic score of 7.5. Consult the Physiology and Biophysics Handbook for further details and additional requirements.

## **General Regulations**

The Department accepts applicants with degrees in physiology, biology, (bio)physics, chemistry, and related biomedical sciences. Applicants with an average GPA of  $\geq 3.7$  over the last two years of their undergraduate program or over their entire undergraduate career will be considered for admission. Applicants with a GPA  $< 3.7$  may be considered in some circumstances. Entering graduate students are expected to acquire a firm understanding of the basic principles of physiology at the systems, cellular and molecular levels that will provide a solid foundation for career development. Students who have not completed advanced undergraduate or graduate level courses in these subjects may be required to take appropriate courses. Advanced knowledge within a specialty is developed by formal courses and/or guided study via directed reading courses arranged for each student through consultation with a supervisory committee. Thesis supervisory committees consisting of the research supervisor and at least two members of the Faculty of Graduate Studies knowledgeable in the field are appointed to guide course selection and to oversee the research of graduate candidates. MSc students may elect to transfer to the PhD program after completion of the first year of study, pending approval of the supervisory committee. Entering PhD candidates must have demonstrated the ability to carry out research of high quality. A Comprehensive Examination in areas relevant to the general field of the thesis research (see [Faculty of Graduate Studies regulations](#) and the Physiology and Biophysics Graduate Handbook) is required in the PhD program. All graduate students participate in the Physiology seminar series each year (PHYL 5517.03). There may also be opportunities to give lectures and to supervise laboratory components of non-medical undergraduate courses.

## **Master of Science (MSc)**

For the minimum time required to complete this program, see the Faculty of Graduate Studies regulations. However, students should expect to spend two years working towards the MSc Degree.

Students must complete enough graduate level courses to equal a total of nine credit hours plus a research thesis. A thesis, reporting original research must be submitted and defended orally. A detailed description of examination procedures and possible outcomes is available from the Faculty of Graduate Studies.

Physiology - PHYL 5517.03: Physiology and Biophysics Graduate Seminar is a mandatory component of the MSc program.

## **Doctor of Philosophy (PhD)**

For the minimum time required to complete this program, see the Faculty of Graduate Studies regulations. Students should expect to spend a minimum of four years working towards the PhD degree.

A comprehensive examination in subjects relevant to the general field of research is required. The comprehensive examination consists of (1) a written paper, (2) an oral synopsis of the paper, and (3) oral examination of the student on matters related to the topic of the paper. The comprehensive examination must be completed within two years of entering the PhD program. Students must satisfy the examining committee in all three areas in order to pass the examination.

A thesis, reporting original research must be submitted and defended orally. The PhD thesis examination will follow the rules and regulations of the Faculty of Graduate Studies.

Physiology - PHYL 5517.03: Physiology and Biophysics Graduate Seminar is a mandatory component of the PhD program.

## Teaching Requirements

Teaching undergraduate physiology, in laboratories, tutorials, or reviews is considered an important part of graduate training. Students may have the opportunity to perform a minimum amount of undergraduate teaching, regardless of the source of their financial support.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

Most courses normally require a minimum enrolment of four students. If less students are interested, it is left to the discretion of the instructor to offer the course in a different format or not offer the course for that year.

## Course Descriptions PHYL

### **PHYL 5504 Advanced Topics in Respiration**

CREDIT HOURS: 3

This course is directed to students interested in increasing their understanding of aspects of pulmonary biology and pathologies. Examples of typical topics which will be examined in depth include epithelial transport, airway smooth muscle, pulmonary function testing, gas exchange, and the effects of exercise on the respiratory system. DIRECTOR: E.A. Cowley

CALENDAR NOTES: Next offered in 2019/2020

PREREQUISITES: PHYL 2032.03 or PHYL 2044.03 or equivalent plus permission of the course coordinator

FORMATS: Lecture | Tutorial

### **PHYL 5508 Directed Readings in Physiology and Biophysics**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to PHYL 5509/PHYL 5510.

PREREQUISITES: Permission of the Director

### **PHYL 5509 Directed Readings in Physiology and Biophysics**

CREDIT HOURS: 3

See PHYL 5508.

### **PHYL 5510 Directed Readings in Physiology and Biophysics**

CREDIT HOURS: 3

See PHYL 5508.

### **PHYL 5513 Endocrine Physiology**

CREDIT HOURS: 3

Offered every second year, or on demand. This course provides an in-depth survey of Endocrinology with emphasis on recent developments. This course focuses on modern technologies involved in the study of the physiology and molecular endocrinology of a number of hormonally regulated systems. The overall objective of the course is to become familiar with a diverse selection of topics in hormone signaling. Topics include: mechanisms of hormone and neuro-peptides synthesis, secretion and action; signal transduction and transcriptional regulation. Seminars will deal with fundamental as well as advanced aspects of these topics derived from reading very recent review articles and research papers. Endocrine disorders will be addressed throughout the course. Students will be expected to make presentations based upon appropriate literature listed by the teaching faculty. DIRECTOR: Y. Anini  
PREREQUISITES: PHYS 2044.03 completed or concomitant, or equivalent, or permission of director

### **PHYL 5517 Physiology and Biophysics Graduate Seminar**

CREDIT HOURS: 3

A mandatory course that all graduate students must complete in order to graduate. Satisfactory performance in the course components is required throughout the degree programs in order for the student to be permitted to register for the course in their final year. The main objectives of the course are to assimilate and evaluate scientific information presented by others, as well as to develop a breadth of knowledge in areas of Physiology and Biophysics research that may be outside their own area of interest. There are four components to the course: 1. The Physiology and Biophysics Departmental Seminar Series. There are several seminars per year and attendance is mandatory for all graduate students. Students will meet informally with guest speakers as a group. Graduate students are also expected to attend relevant seminars in other Faculty of Medicine and University Departments. 2. Graduate Student Research Day of the Department of Physiology and Biophysics. Students must present their work, either orally or in poster format at the Annual Graduate Student Research Day. 3. Graduate Student Research Day of the Faculty of Medicine. MSc students are required to present a poster at the annual Graduate Student Research Day of the Faculty of Medicine in their second year of study (and annually thereafter for as long as they are in the program). PhD students must participate in the Graduate Student Research Day of the Faculty of Medicine in their second year of study and yearly thereafter. If a student for valid reasons cannot meet the date of Graduate Student Research Day of the Faculty of Medicine, presentation of a poster at a national or international conference is considered as equivalent. 4. Students must present at least one Departmental Seminar over the course of their programs. Each student seminar is monitored by a faculty committee selected by the Graduate Education Committee to ensure that the students receive oral and written feedback on their presentation. DIRECTOR: Y. El Hiani

### **PHYL 5519 Molecular Physiology of Ion Channels**

CREDIT HOURS: 3

This course focuses on the molecular properties of ion channels and includes an overview of the techniques used to study ion channel structure and function, ion permeation and selectivity, channel gating and modulation, the mechanisms by which channels are affected by drugs and toxins, and genetic diseases causing channel dysfunction. DIRECTOR(S): P. Linsdell  
PREREQUISITES: PHYL 3320.03 or equivalent plus permission of the course director  
FORMATS: Lecture

### **PHYL 5568 Advanced Cardiovascular Physiology**

CREDIT HOURS: 3

This course provides a detailed overview of key concepts of cardiovascular physiology and disease, including discussion of current research in the field. Students will be expected to make presentations based on appropriate literature. Topics include: cardiac anatomy/structure; electrophysiology; excitation-contraction coupling; mechanics; pump-function and regulation of the vasculature. Director: T. A. Quinn  
PREREQUISITES: Permission of the course director  
CROSSLISTED: BMNG 5270.03 Advanced Cardiovascular Physiology  
EXCLUSIONS: PHYL 4680.03 Cardiovascular Physiology  
FORMATS: Lecture | Discussion | Other (explain in comments)

### **PHYL 5608 Directed Readings in Physiology and Biophysics**

CREDIT HOURS: 6

NOTE: Course Details listed here also apply to PHYL 5609/PHYL 5610.

PREREQUISITES: Permission of the Director



### **PHYL 5609 Directed Readings in Physiology and Biophysics**

CREDIT HOURS: 6

See PHYL 5608.

### **PHYL 5610 Directed Readings in Physiology and Biophysics**

CREDIT HOURS: 6

See PHYL 5608.

### **PHYL 9000 MSc Thesis**

CREDIT HOURS: 0

MSc students should register for this “course” each year.

### **PHYL 9530 PhD Thesis**

CREDIT HOURS: 0

PhD students should register for this “course” each year.

## **Course Descriptions NESC**

### **NESC 6101 Principles of Neuroscience: Cellular and Molecular Neuroscience**

CREDIT HOURS: 3

Neuroscience 6101.03 and 6102.03 are Neuroscience 6100X/Y.06 divided into terms A and B for suitable incorporation into non-Neuroscience programs.

NESC 6101 will focus on cellular and molecular neurobiology and will cover topics such as membrane potentials, synaptic transmission, second messengers, trophic factors, cell differentiation and neurodegeneration. Evaluation will be based on quizzes, several oral presentations prepared throughout the year, and grant proposals.

### **NESC 6102 Principles of Neuroscience: Systems and Behavioral Neuroscience**

CREDIT HOURS: 3

Neuroscience 6101.03 and 6102.03 are Neuroscience 6100X/Y.06 divided into terms A and B for suitable incorporation into non-Neuroscience programs.

NESC 6102 will focus on systems and behavioural neurobiology and will cover topics such as visual and somatosensory systems, motor program generation, autonomic and neuroendocrine functions, motivation, learning, circadian rhythms and sleep/wake cycles and cognitive neuroscience. Evaluation will be based on quizzes, several oral presentations prepared throughout the year, and grant proposals.

## **Physiotherapy**

Location:

Forrest Building

4th Floor

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2524

Fax Number: (902) 494-1941

Email Address: [physiotherapy@dal.ca](mailto:physiotherapy@dal.ca)

Website: [www.physiotherapy.dal.ca](http://www.physiotherapy.dal.ca)

## **Introduction**

The School of Physiotherapy offers two Masters level graduate programs, as well as a joint degree option:

The **Master of Science (Physiotherapy)** degree provides the professional education required to obtain a license to practice physiotherapy. The profession of Physiotherapy (or Physical Therapy) offers a varied, interesting, and worthwhile career in a variety of settings. Upon graduation, physiotherapists may work in hospital-based departments rotating through various areas of interest prior to becoming more deeply involved in any specific area, or, opportunities are increasingly available in rehabilitation centres, extended care units, special schools, local government agencies, industrial health units, sports clubs, and private clinics.

The **Master of Science (Rehabilitation Research)** degree provides the skills and knowledge to design and implement research in diverse areas of rehabilitation science and requires the completion and defense of a thesis. Graduates may hold careers in academia, government, the private sector, or self-employment.

The School of Physiotherapy offers a **Joint MScPT-Rehabilitation Research** combined program for eligible students with an interest in entry-to-practice Physiotherapy and Rehabilitation Research. This degree combination allows students the opportunity to obtain both degrees (MSc Physiotherapy and MSc Rehabilitation Research) in a period of three years. Graduates may hold careers in clinical practice, clinical research, academia, and research related inquiry through PhD studies. To be eligible for this intensive three-year period of study, students must be admitted into both the MSc Physiotherapy and MSc Rehabilitation Research programs in the same application year. Please see information pertaining to these two programs for further information.

## Staff

## Staff

### **Director (Interim) (July 2019-June 2022)**

**Shaw, L.**, BScOT (Western), MScOT, (Western), PhD, Rehabilitation Science (Western)

### **Associate Director (Interim) (July 2019 to June 2022)**

**Rutherford, D.**, BSc (UWO), BSc PT (Toronto), MSc, PhD (Dalhousie)

### **MSc PT Graduate Coordinator**

**Earl, M.**, BSc PT (UWO), BSc, MSc, PhD (Waterloo)

### **MSc RR Graduate Coordinator**

**Kozey, C.**, BPE (UNB) MSc (Waterloo), PhD (Dalhousie)

### **Professor Emeritus**

**Walker, J.**, Cert. Phys. Ther. (NZ), DipTP, BPT, MA (Manitoba), PhD (McMaster)

### **Professors**

**Aiken, A.**, BSc (Ottawa), BSc PT (Dalhousie), MSc, PhD (Queen's), CD

**Kozey, C. L.**, BPE (UNB), MSc (Waterloo), PhD (Dalhousie)

### **Associate Professors**

**Boe, S.**, BPhEd (Brock), MPT, PhD (Western)

**Curwin, S.**, Dip PT, BSc PT, MSc (Dalhousie), PhD (USC)

**Rutherford, D.**, BSc (UWO), BSc PT (Toronto), MSc, PhD (Dalhousie)

### **Assistant Professors**

**Dechman, G.**, BSc PT (Queen's), PhD (McGill)

**Earl, M.**, BSc PT (UWO), BSc, MSc, PhD (Waterloo)

**Kehler, S.**, BPE, BKin, MSc, PhD (UofM)

**McArthur, C.**, BScKin (Waterloo), MScPT (Toronto), PhD (Waterloo)

**Moyer, R.**, BPHE, BSCh (Queen's), MPT, PhD (UWO)

### **Cross Listed Faculty**

**Blanchard, C.**, BA (UPEI), MSc, PhD (Alberta)

**Dithurbide, L.**, BA (SMU), MA (Brock), PhD (Michigan State)

**Hughes, D.**, BSc (UNB), MD (Dalhousie), FRCPC  
**Kamal, N.**, BSc (Calgary), MSc (UBC), PhD UBC)  
**Keats, M.**, BA (Calgary), MSc (Alberta), PhD (Calgary)  
**MacKenzie, D.**, BSc (Saskatchewan), BSc (OT) (Alberta), MA (Ed) (MSVU)  
**Moreside, J.**, BSc (OT/PT) (UBC), MHK (Windsor), PhD (Waterloo)  
**Neyedli, H.**, BSc (Dalhousie), MAS (Toronto), PhD (Toronto)  
**Westwood, D.**, BSc, MA, PhD (Waterloo)

### **Adjunct (FGS)**

**Harman, K.**, BSc PT (Toronto), MSc (Ottawa), PhD (Carleton)  
**McPhee, J.**, BSc, MSV, BSc (PT), PhD (Pharm) (Dalhousie)  
**Ploughman, M.**, BSc PT (Dalhousie), MSc, PhD (Memorial)  
**Rennie, S.**, DipPT, BPT, MSc, PhD (Alberta)  
**Walker, J.**, Cert Phys Ther (NZ), DipTP, BPT, MA (Manitoba), PhD (McMaster)

### **Lecturers**

**Creaser, G.**, BSc PT (Dalhousie), MEd (MSVU)

### **Instructors**

**Bourret, D.**, BScMedSc (Western) MScPT (Toronto)  
**Grosweiner, K.**, BScChem (UNB) BScPT (Dalhousie) PME (Queen's)  
**Kelly, B.**, DipPT (Dublin), BScPT (Dal), MScRR (Dalhousie)  
**Quigley, A.**, BScKin (Saskatchewan), MScPT (Toronto), PhD (Dalhousie)

### **Academic Coordinator of Clinical Education**

**Pereira, D.**, BSc PT (Manipal Univ), MPT (Manipal Univ)

### **Provincial Clinical Coordinators**

**Caldwell, B.**, Prince Edward Island  
**Hurtubise, K.**, Newfoundland and Labrador

## **Master of Science (Physiotherapy) (MSc Physiotherapy)**

The MSc (Physiotherapy) entry to practice program is full-time and offered over a continuous 25-month period. The curriculum prepares students with the professional education and experience necessary to apply for the national licensing examination. The School of Physiotherapy at Dalhousie is the only school serving Atlantic Canada; as such, a provincial quota system is in place with a specified number of seats allocated annually for residents of New Brunswick, Prince Edward Island, Newfoundland, and Nova Scotia. A small number of seats are open to non-residents. Therefore, admission is offered on a competitive basis and enrolment is limited.

### **Admission Requirements**

- Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.
- A four-year undergraduate degree or equivalent in any field of study from Dalhousie University or from a recognized academic institution with a minimum grade point average of 3.3 or letter grade of B+ in the last 60 undergraduate credit hours. Degrees that have a focus in Neuroscience, Psychology, Kinesiology, Human Movement Science, Exercise Science, Human Physiology, Health Promotion, Ergonomics and Anatomy are favorable backgrounds for the study of Physiotherapy.
- The completion of [Altus Assessments CASPER examination](#). Please see [School of Physiotherapy website](#) for more details pertaining to this admissions requirement.
- The following courses or their equivalents are prerequisites for admission:
  - Statistics (three credit hours, e.g., Statistics, Research Design, Research Methods)
  - Human Physiology (six credit hours, equivalent to PHYL 1010.06: Human Physiology)

- Human Anatomy (three credit hours, equivalent to ANAT 1010.03: Basic Human Anatomy)
- Languages and Humanities and/or Social Sciences (six credit hours, e.g., Sociology, Economics, Psychology, History, Fine Arts, English, Classical Studies, Music, Dance, Film Studies, Philosophy, Religion, Anthropology, Political Science. **At least 3 credit hours must be Psychology**)
- Life Sciences (three credit hours, e.g., Biology, Chemistry, Cell Biology, Biochemistry, Biophysics, Neuroscience, Biomedical Engineering)
- **Strongly recommended:** to take Physics and/or Biomechanics in Human Movement (three or six credit hours) to prepare for studies in Physiotherapy at Dalhousie University.
- Reference Letters - two academic, confidential reference letters.
- 40 hours of community volunteer experience over the last two years
- Clinical Education Requirements - In order to satisfy the requirements for the clinical internship components of the program, students must provide proof of immunization to the Coordinator of Clinical Education for: Diphtheria-Tetanus, Measles, Mumps, Rubella and Hepatitis B. Before students can enter the clinical setting, they must provide verification of a Tuberculosis skin test and serology for Measles, Rubella, Varicella and Hepatitis B. In addition, a recent satisfactory criminal record check, including a vulnerable sector survey, and a valid CPR (level C) certificate, is required prior to our start date in September.
- Equitable & Inclusion Admissions Policy- The School of Physiotherapy is committed to increasing the admission of and number of graduates from historically underrepresented groups: persons of Aboriginal/Indigenous ancestry, members of racialized groups, persons of African descent, Acadians, persons with dis/Abilities, and persons belonging to minority sexual orientation and/or gender identity (SOGI) groups. Admission prerequisites are required for all applicants. However, applicants who apply under the Equitable Admissions Policy are considered on the basis of their qualifications for graduate study in physiotherapy rather than in relation to other candidates. The School of Physiotherapy encourages applicants who wish to apply under the Equitable Admissions Policy to indicate so on the Graduate Application Form and their Supplementary Application Form.
- Applicants who meet the above minimum requirements are eligible for interview consideration. The interview score is based on communication and problem-solving analysis (eligibility for interview is based on the GPA). Fulfillment of the minimum requirements does not guarantee an interview.

Deadline for application is January 31.

## Physiotherapy Registration

Physiotherapists educated in Canada must be registered with the appropriate regulatory body. The school itself has no jurisdiction in matters related to regulation, and Dalhousie University cannot accept responsibility for changes in regulatory regulations which may occur from time to time.

The degree program at Dalhousie University is designed to fulfill the present registration requirements by the time students graduate. A Physiotherapy Competency Examination was implemented in 1993. Successful completion of the national competency exam is required for registration in all provinces except Quebec. Graduates are strongly advised to seek further information and clarification from the appropriate provincial College of Physiotherapists.

## Association Membership

Information regarding membership in various Physiotherapy Associations can be obtained from the following sources:

The Canadian Physiotherapy Association  
955 Green Valley Crescent, Suite 270  
Ottawa, ON K2C 3V4

The Chartered Society of Physiotherapy  
14 Bedford Row  
London, WC1R 4ED, England

The American Physical Therapy Association  
1111 North Fairfax Street  
Alexandria, Virginia, 22314-1488 USA

## Accreditation

The Master of Science (Physiotherapy) program at Dalhousie University has completed the accreditation review process administered by Physiotherapy Education Accreditation Canada (PEAC). PEAC is an incorporated body under the Canada Not-for-profit Corporations Act and operates as the accrediting agency for physiotherapy education programs in Canada. The status of Accreditation – Probationary was granted to the program on April 30, 2020. A description of Accreditation – Probationary follows.

## Accreditation – Probationary

- A program is non-compliant in a CORE criterion OR
- A program is in compliance with less than 50% of the accreditation criteria in one standard OR
- A program is in compliance with less than 80% of the accreditation criteria in more than two standards OR
- A program fails to demonstrate progress in addressing the identified concerns in its required Progress Report(s)

### STUDENTS - IMPORTANT TO NOTE:

- If a program loses its accreditation status, its students may not be considered graduates of an accredited physiotherapy education program.
- Students must be considered graduates from an accredited physiotherapy education program in Canada in order to be eligible to write the Physiotherapy Competency Exam and be licensed to practice physiotherapy in Canada.
- The program's accreditation status is important to graduating students with regards to becoming licensed to practice physiotherapy in Canada. It is recommended that students contact the Canadian Alliance of Physiotherapy Regulators ([alliancept.org](http://alliancept.org)) for information regarding the process to become licensed as a physiotherapist in Canada following graduation.

More details regarding the definitions of the levels of accreditation are available at <http://www.peac-aepc.ca/english/accreditation/levels-of-accreditation.php> or by contacting Physiotherapy Education Accreditation Canada, Suite 26, 509 Commissioners Road West, London, Ontario, N6J 1Y5, (226) 636-0632, [www.peac-aepc.ca](http://www.peac-aepc.ca)

## Practicum/Fieldwork Placements Outside Halifax

Students enrolled in entry-to-practice graduate programs of study in the Faculty of Health Professions are advised that they may have to do some or all of their required clinical education/fieldwork at sites outside Halifax, and hence may have to incur additional personal expenses for travel and temporary accommodation.

In some situations, sites may require a payment to the site for support of clinical education/fieldwork supervision, and some sites may require separate disability insurance in lieu of eligibility for Worker Compensation coverage. Such costs are the responsibility of the student.

## Interprofessional Health Education

Students are required to maintain enrolment in IPHE 5900 for the duration of their studies. Please register in IPHE 5900.00 (section 4). Successful completion of this course is a requirement for graduation and will be recognized further with the awarding of a special Certificate in Interprofessional Collaboration to be presented by the Faculty of Health Professions. Students are asked to consult with their individual school/college to determine the specific guidelines and expectations regarding the required portfolio.

## Master of Science (Rehabilitation Research - Physiotherapy) (MSc)

The Master of Science (Rehabilitation Research -Physiotherapy) is a thesis program designed to provide graduates with skills and knowledge to design and implement research in diverse areas of rehabilitation science, supporting the future of evidence-based practice in our health care system.

The Master of Science (Rehabilitation Research-Physiotherapy) does not prepare graduates to take the physiotherapy licensure exams; applicants who want to study to become physiotherapists need to apply to the MSc (Physiotherapy) program.

Individuals seeking enrichment for their professional development may also apply for admission to single graduate level courses, through the Special Student-[Graduate Studies](#) category as detailed in Section 5.7.7.

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. In addition, an applicant's four-year Bachelor's degree must be in an area of study related to the MSc RRPT program, including (but not limited to) physiotherapy, kinesiology, psychology, neuroscience, and health sciences. Students with degrees unrelated to the MSc RRPT program should contact the school to determine eligibility.

## Application

### Applicants must

1. Complete the application form for admission to the Faculty of Graduate Studies
2. Include a one-page statement of their experience, their goals and objectives, and the area of physiotherapy research to be studied.
3. Meet the English language competency requirements as outlined by Graduate Studies.
4. Include two academic references. A work reference from someone who may comment objectively on your goals may be included in addition to the two required academic references.
5. Include two official transcripts from universities attended, sent directly to the School of Physiotherapy from the Registrar's Office of the home institution.

In addition, applicants are strongly advised to:

1. Include a copy of a recent paper authored in the area in which the applicant is planning to pursue studies (if available)
2. Submit a recent GRE score

### Scholarship Deadlines

A minimum GPA of 3.7 (out of 4.3) is required for scholarship consideration, for students enrolled in full-time studies.

Applicants who wish to be considered for scholarships are strongly urged to contact potential supervisors in the fall of the year preceding their application year, as deadlines for external agencies are usually late fall.

Applications completed by January 31 will be considered for FGS and School level scholarships, however applicants are expected to seek external funding before other sources will be considered. Further information for sources of funding may be obtained from the Graduate Studies office.

For more information regarding admission and program requirements, please write to the Graduate Coordinator, School of Physiotherapy, Dalhousie University, Halifax, NS B3H 3J5 or email [ptadmissions@dal.ca](mailto:ptadmissions@dal.ca)

## Program Requirements

Students registered in the program will be expected to obtain a minimum of 24 credit hours as follows: Thesis - 12 credit hours, Course work - 12 credit hours.

### Course Work

Nine credit hours are obtained via required courses. A minimum of an additional three credit hours of elective courses will be selected based on the individual program of study approved by the Supervisory Committee.

### Residency

For full-time students, the typical duration of the program is two years, as it is expected upon completion of course work that an additional year will be required to complete the thesis. Part of the residency period may, with permission, include time off campus. There are options to complete the program on a part-time basis.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

### Master of Science (Physiotherapy) Courses

- PHYT 5101.01: Introduction to the Physiotherapy Profession (Module 1)
- PHYT 5103.03: Movement and Exercise Science (Module 3)
- PHYT 5104.06: Cardiorespiratory Physiotherapy and Health Promotion (Module 4)
- PHYT 5105.12: Musculoskeletal Physiotherapy (Module 5)
- PHYT 5202X/Y.03: Scientific Inquiry I
- ANAT 5217.06: Functional Human Anatomy
- PHYT 5460.03: Advanced Exercise Physiology
- PHYT 5501.03: Clinical Placement (Cardiorespiratory)
- PHYT 5502.03: Clinical Placement (Musculoskeletal)
- PHYT 6106.03: Professional, Ethical, and Management Issues in Physiotherapy (Module 6)
- PHYT 6107.06: Neurological Physiotherapy Practice for the Entry-Level Clinician (Module 7)
- PHYT 6108.12: Integrated Practice in Acute, Rehabilitation and Home/Community Settings (Module 8)
- PHYT 6140.06: Neuroscience for Physiotherapy Students
- PHYT 6202X/Y.06: Scientific Inquiry II
- PHYT 6501.03: Clinical Placement (Neurotherapeutics)
- PHYT 6502.03: Clinical Placement (Integrated Practice)
- PHYT 6503.03: Senior Clinical Placement

### Master of Science (Rehabilitation Research - Physiotherapy) Courses

Required Courses:

- PHYT 5040X/Y.03: Graduate Seminar Series: Basic and Applied Aspects of Rehabilitation
- PHYT 5590.03 Measurement and Instrumentation (or equivalent as determined by the Supervisory Committee)
- Three credit hours in Research Design and Biostatistics (i.e., NURS 5100.03, HINF 6030.03)
- PHYT 9000.00: Thesis

Electives:

- PHYT 5010.03: Special Topics in Musculoskeletal II
- PHYT 5020.03: Introduction to Computers for Data Acquisition and Processing
- PHYT 5030.03: Special Topics in Neurology I
- PHYT 5050.03: Special Topics in Cardiac Rehabilitation III
- PHYT 5070.03: Directed Study
- PHYT 5080.03: Directed Study
- PHYT 5300.03: Skeletal Muscle Function through Surface Electromyography
- PHYT 5572.03: Topics in Human Performance: Motor Control

## Course Descriptions

### PHYT 5010 Special Topics in Musculoskeletal II

CREDIT HOURS: 3

This course is designed to provide in depth study of the evidence guiding physiotherapy assessments and interventions for the prevention and treatment of designated musculoskeletal impairments. Current theories and practices will be examined using examples such as disorders that are associated with the electronic workplace, arthritic conditions, or low back pain.

### **PHYT 5020 Introduction to Computers for Data Acquisition and Processing**

CREDIT HOURS: 3

This course provides a basic knowledge of data acquisition and processing methods through the use of MatLab® and LabVIEW® technical computing environments. This course is divided into 1 lecture hour and 4 tutorial hours per week and is intended to introduce these programs to individuals who begin their graduate studies with minimal background knowledge in mathematics, computer programming and data management.

FORMATS: Lecture | Tutorial

### **PHYT 5030 Special Topics in Neurology I**

CREDIT HOURS: 3

In this course, students will conduct a critical analysis of the evidence supporting physiotherapy management of people with functional disabilities arising from diseases or conditions that affect neurological control of movement. The course will emphasize topics such as the sensory-motor and neuromuscular control processes that affect gait, balance, and functional abilities of a variety of populations (e.g., aging adults, and people with functional impairments due to Parkinson's, cerebrovascular accident, or arthritic conditions).

### **PHYT 5040 Graduate Seminar Series: Basic and Applied Aspects of Rehabilitation**

CREDIT HOURS: 3

The objective of this seminar is to expose students to topics in rehabilitation; it consists of students and invited guest's presentations of the latest findings in rehabilitation. Seminars will provide knowledge in basic/applied aspects of rehabilitation in and outside physiotherapy while helping students develop the ability to present in an academic/professional setting.

RESTRICTIONS: Restricted to students enrolled in MSc Rehabilitation Research program

FORMATS: Seminar

### **PHYT 5050 Special Topics in Cardiac Rehabilitation III**

CREDIT HOURS: 3

Students will conduct an advanced analysis of the theories and tenets underlying physiotherapy management of cardiovascular disorders. Scientific evidence will be applied to support assessment and intervention strategies to address cardio-respiratory function or cardiovascular fitness. Examples will be based on topics such as health-promotion, cardiac rehabilitation, and cardiovascular function following cerebral stroke.

### **PHYT 5070 Directed Study**

CREDIT HOURS: 3

This course explores physiotherapy practice and the physiotherapy profession. Through an understanding of the history and background of the profession and an up-to-date view of current practice, students will form opinions regarding the direction the profession is taking, and vehicles for change that are available. Various aspects of current and past physiotherapy culture, practice, leadership, and academia will be discussed. Students will have the opportunity to present their own perspectives and issues.

### **PHYT 5080 Directed Study**

CREDIT HOURS: 3

Individual students work with a designated faculty member to conduct an in-depth examination of a topic that is chosen to address a specific educational need. The content, resources, and evaluation methods are customized to address a specific learning issue that relates to the student's research area.

### **PHYT 5101 Introduction to Physiotherapy Practice**

CREDIT HOURS: 1

This introductory course will provide the student with an orientation to the entire curriculum by: discussing expectations, evaluation, structure and process; helping to familiarize the student with the healthcare context of the practice of physiotherapy; introduce students to the profession of physiotherapy through discussion and site visits; instructing and providing opportunity to practice interpersonal skills and professional behaviours that will continue to develop throughout the two years and that will prepare graduates to be professionals. Subsequent courses will deepen students understanding and apply in practice many of the concepts presented in this orientation course.

FORMATS: Lecture | Lab | Tutorial | Seminar



### **PHYT 5103 Movement and Exercise Science**

CREDIT HOURS: 3

The purpose of this course is to provide students with an understanding of the theories and principles associated with the study of human movement and exercise science so they can apply these to solve clinical problems encountered in physiotherapy practice. Understanding these concepts as they apply to normal movement and exercise will precede a discussion of clinical problems. The movement and exercise science course will provide the foundation for applying anatomy, biomechanics, and movement assessments to evaluate motor function.

FORMATS: Lecture | Lab

### **PHYT 5114 Cardiorespiratory Physiotherapy/Health Promotion I**

CREDIT HOURS: 3

The purpose of this course is for students to develop the competencies needed to provide safe, effective, evidence-based, patient-centered interventions for people with acute cardiopulmonary impairments and associated disabilities. Clinical reasoning is a key skill to achieving this goal. Students will be expected to use knowledge of anatomy, physiology, pathophysiology, and movement science to inform and enhance their understanding of normal function of the respiratory and cardiovascular systems and the interactions between these and other organ systems that affect patients' health and well-being. Communication is another key skill needed to develop a therapeutic relationship with patients and their support networks, and to facilitate behavior change, a key component in the prevention and treatment of disease.

RESTRICTIONS: MScPT students, Year 1

FORMATS: Lecture | Lab | Discussion

### **PHYT 5115 Musculoskeletal Physiotherapy I**

CREDIT HOURS: 3

This course will cover basic concepts and skills that apply to the practice of musculoskeletal physiotherapy. Emphasis is placed on physiological, mechanical, and clinical concepts that underpin the practice of musculoskeletal physiotherapy. The course will consist of lectures, labs, self-directed readings and assignments. The course also will introduce electrophysical agents (EPAs) used in physiotherapy practice.

FORMATS: Lecture | Lab

### **PHYT 5202 Scientific Inquiry I**

CREDIT HOURS: 3

The purpose of this course is to develop fundamental knowledge and skills for evidence-based physiotherapy. The focus is on application of scientific principles in physiotherapy practice, including critical appraisal and synthesis of best-available evidence for translation to patient-centered physiotherapy practice. The emphasis is on integration of patient values/circumstances with the best-available evidence, and clinical expertise to establish and implement evidence-based physiotherapy. This course provides a foundation and framework for using scientific inquiry in concurrent, and all subsequent course work including clinical experiences; this approach confirms our philosophy that critical appraisal and best practice is core to physiotherapy practice.

CALENDAR NOTES: Registration in both Fall and Winter terms of Year 1.

EXCLUSIONS: PHYT 5102.09

FORMATS: Lecture | Lab | Seminar | Discussion

### **PHYT 5214 Cardiorespiratory Physiotherapy /Health Promotion II**

CREDIT HOURS: 3

The purpose of this course is for students to develop the competencies needed to provide safe, effective, evidence-based, patient-centered interventions for people with complex and chronic diseases based on three content themes: chronic pulmonary disease (chronic obstructive lung disease, cystic fibrosis, idiopathic pulmonary fibrosis), chronic cardiac disease (coronary artery disease, congenital heart disease, heart failure), and critical care and survivorship in adults and children. They will consider how multi-morbidity and frailty, in adults and children, impact patients' quality of life, life goals and thus physiotherapy management. The role of an interprofessional team in care for people with complex and chronic diseases will be an overarching theme throughout the course. Students will be challenged to build on the knowledge and skills, including clinical reasoning, developed in PHYT 5114 to meet the course objectives. The course runs parallel to PHYT 5460 (Advanced Exercise Physiology) and students will need to use this information to patient assessment and management strategies. This course will address the role of rehabilitation programs in enhancing exercise capacity, self-management, and quality of life in people with chronic diseases. Students will learn to use communication for behavior change techniques as part of physiotherapy management. Students' appreciation for the challenges of living a meaningful life with chronic disease will be a springboard to explore the role of disease prevention in physiotherapy practice and the health care system at large.

COREQUISITES: PHYT 5460.03

PREREQUISITES: Successful completion of all MScPT Year 1 fall term courses.

FORMATS: Lecture | Lab

### **PHYT 5215 Musculoskeletal Physiotherapy II**

CREDIT HOURS: 6

This course will cover diagnosis, assessment, and treatment techniques for disorders of the musculoskeletal system. The course will consist of lectures, labs, group discussion, self-directed readings, and assignments. The course also will continue the use of electrophysical agents (EPAs) in physiotherapy.

PREREQUISITES: Successful completion of all MScPT Year 1 fall term courses.

FORMATS: Lecture | Lab | Discussion

### **PHYT 5300 Skeletal Muscle Function through Surface Electromyography**

CREDIT HOURS: 3

Electromyography provides an extracellular view of the processes associated with skeletal muscle activation, and thus an important link to physiology when studying human movement. The objective of this course is to provide the student with the theoretical foundation for EMG studies, practical experience in acquiring EMG data and with an opportunity to critically evaluate the current literature that uses surface EMG to study muscle function on topics such as pathological gait, dynamic stability of the spine, therapeutic exercise assessment and functional impairments. The course will consist of small group sessions, seminars, and laboratory experiences.

### **PHYT 5460 Advanced Exercise Physiology**

CREDIT HOURS: 3

The course covers the cellular basis of metabolism and the immediate and long-term effects of exercise on the cardiopulmonary, endocrine, and neuromuscular systems. This knowledge is applied to exercise training.

PREREQUISITES: Successful completion of all MScPT Year 1 fall term courses.

FORMATS: Lecture | Lab | Tutorial

### **PHYT 5500 Clinical Placement (Orientation)**

CREDIT HOURS: 1

The main purpose of the placement is to introduce students to basic clinical skills and build confidence through clinical experience early in the program. The placement would be advantageous in familiarizing students to a therapeutic environment, preparing students for subsequent placements and enhancing the student's appreciation of the relevance of content delivered during the academic courses.

PREREQUISITES: Successful completion of Year 1, final clinical examinations.

FORMATS: Experiential Learning

### **PHYT 5501 Clinical Placement (Cardiorespiratory)**

CREDIT HOURS: 3

The clinical component of the program provides for the integration and application of learning in current academic studies to the clinical environment leading to the development of clinical competence in Cardiorespiratory practice. Each student is required to complete six weeks of full-time clinical practice in the cardiorespiratory practice area to gain an understanding of the scope and role of cardiorespiratory physiotherapy practice in tertiary, community, and primary healthcare environments.

PREREQUISITES: Successful completion of all MScPT Y1 fall and winter term courses.

FORMATS: Lecture | Lab | Experiential Learning

### **PHYT 5502 Clinical Placement (Musculoskeletal)**

CREDIT HOURS: 3

The clinical component of the program provides for the integration and application of learning in current academic studies to the clinical environment leading to the development of clinical competence in musculoskeletal practice. Each student is required to complete six weeks of full-time clinical practice with exposure to a variety of practice areas in physiotherapy. It is expected that the student will gain an understanding of the scope and role of musculoskeletal physiotherapy practice in tertiary, community and primary healthcare environments.

PREREQUISITES: Successful completion of MScPT Y1 winter term courses.

FORMATS: Lecture | Lab | Experiential Learning

### **PHYT 5572 Topics in Human Performance: Motor Control**

CREDIT HOURS: 3

This course is intended to be a graduate level seminar which attempts to provide careful examination of published research and other written work in the area of motor control. The first portion of the course will consist of a brief review of the mechanical and physiological foundations of motor control and an illustration of some of the most useful and popular paradigms in the field. The second portion of the course will turn to classic problems and current theoretical and empirical attempts to solve them. The last portion of the course will involve presentations by members of the seminar group. The format of the presentations can vary according to individual and the topic under consideration. Some suggestions would include: 1) a literature review of a specific

topic, 2) a grant proposal for a research project and 3) the results of a study conducted during the course.

CROSSLISTED: KINE 5572.03

### **PHYT 5590 Measurement and Instrumentation in Human Movement Analysis**

CREDIT HOURS: 3

This class will provide students with both a theoretical and practical understanding of the many issues related to instrumentation in human movement studies. Students will be required to apply the fundamentals of measurement therapy to specific instruments. Small experiments will be conducted, and students will be required to submit a written report demonstrating their understanding of how particular instruments are used, and how results are interpreted.

CROSSLISTED: KINE 5590.03

### **PHYT 6106 Professional, Ethical, and Management Issues in Physiotherapy**

CREDIT HOURS: 3

This course builds on professional and communication objectives embedded throughout the program. Emphasis is placed on professional behaviours based on the current ethical and legal framework for practice and the role physiotherapy plays as an integral component of Canadian healthcare. Students will engage in dialogue and debate on issues of healthcare management, reform, and the business of physiotherapy.

PREREQUISITES: Successful completion of all year 1 courses/modules

FORMATS: Lecture | Seminar | Discussion

### **PHYT 6107 Neurological Physiotherapy Practice for the Entry-Level Clinician (Module 7)**

CREDIT HOURS: 6

This academic module gives students the opportunity to acquire knowledge and develop the competencies and professional behaviors in preparation for physiotherapy practice for individuals with neurologic disorders. Neurophysiological concepts and neurotherapeutic approaches to assessment and management of conditions across the lifespan and across the continuum of care are introduced in an integrated manner. Students are required to draw on their knowledge of anatomy, neuroanatomy, physiology, exercise physiology, and therapeutic exercise as they explore topics in neurological physiotherapy. Emphasis is placed on understanding theoretical principles and developing assessment and treatment skills through critical analysis of case studies, laboratory practice, clinical visits, and self-directed learning. The International Classification of Functioning, Disability and Health (ICF) and the Clinical Reasoning Model serve as theoretical frameworks to prepare students for effective practice. This academic module is followed by a six-week clinical placement in neurological physiotherapy.

COREQUISITES: PHYT 6140

PREREQUISITES: Successful completion of all Year 1 courses/modules

FORMATS: Lecture | Lab | Seminar | Discussion

### **PHYT 6115 Musculoskeletal Physiotherapy III**

CREDIT HOURS: 3

This course will apply and expand concepts from MSK I and MSK II to areas of special focus in musculoskeletal conditions, including sports injuries, paediatric orthopaedics, and psychosocial conditions. Using individual cases from recent clinical placements, students will reflect on the patient treatment program and revise this program to include further knowledge in manual therapy and psychosocial factors that can be used in future to improve students' treatment of musculoskeletal conditions.

CALENDAR NOTES: Beginning of Y2 MScPT program.

PREREQUISITES: PHYT 5501/5502

FORMATS: Lecture | Lab | Discussion

### **PHYT 6118 Integrated Practice I**

CREDIT HOURS: 8

This is the first of two senior courses in which students develop knowledge, understanding, and skills to address the health issues faced by those who live with complex, chronic health conditions in the context of diverse personal and environmental factors. Structured PBL-focused learning activities, augmented by lectures, labs, and clinical interactions, are specifically designed for students to integrate knowledge and skills developed in previous courses, for development, use, and evaluation of client-centered, evidence-based physiotherapy services across the continuum of care. Multi-system analysis and clinical reasoning, applied within the ICF framework, are emphasized, in concert with development of skills for sensitive, effective collaborative learning and practice.

COREQUISITES: PHYT6202, PHYT6106, IPHE

PREREQUISITES: PHYT 6501, PHYT6140, PHYT6107

FORMATS: Lecture | Lab | Tutorial | Seminar

### **PHYT 6140 Neuroanatomy for Physiotherapy Students**

CREDIT HOURS: 6

This graduate level course in neuroscience will expose entry-level physiotherapy students to the foundational and advanced neuroanatomical and neurophysiological concepts and knowledge needed for evidence-based practice in neurorehabilitation.

COREQUISITES: PHYT 6107

PREREQUISITES: Successful completion of all Year 1 course/modules

FORMATS: Lecture | Lab | Seminar

### **PHYT 6202 Scientific Inquiry II**

CREDIT HOURS: 6

Students are required to successfully complete an independent Major Project. The project is comprised of a series of written components which, when consolidated, will culminate in the completion of a Research Proposal suitable for submission to an Ethical Review Board.

PREREQUISITES: Successful completion of all Year 1 courses/modules

FORMATS: Lecture | Lab | Seminar | Discussion

### **PHYT 6218 Integrated Practice II**

CREDIT HOURS: 4

This capstone course is the second of the two senior courses in which students develop knowledge, understanding, and skills to address the health issues faced by those who live with complex, chronic health conditions in the context of diverse personal and environmental factors. Having complete the first of their two senior clinical placements, use of case-based learning is progressed to further develop the student's ability to identify and address their own learning issues related to the development, use, and evaluation of collaborative, client-centered, evidence-based physiotherapy services across the continuum of care. There is continued emphasis on the use of multi-system analysis and clinical reasoning, within the ICF framework, in concert with skills for sensitive, effective collaborative learning and practice, as appropriate for the senior student who is nearing readiness for independent practice.

COREQUISITES: PHYT6202 , PHYT6106, IPHE

PREREQUISITES: PHYT 6501, PHYT6140, PHYT6107, PHYT6118, Integrated Practice Placement #1

FORMATS: Lecture | Lab | Tutorial | Seminar

### **PHYT 6501 Clinical Placement (Neurotherapeutics)**

CREDIT HOURS: 3

The clinical component of the program provides for the integration and application of learning in current academic studies to the clinical environment leading to the development of competence in neurotherapeutics practice. Each student is required to complete six weeks of full-time clinical practice with exposure to a variety of practice areas in physiotherapy. It is expected that the student will gain an understanding of the scope and role of neurotherapeutic physiotherapy practice in tertiary, community, and primary healthcare environments.

PREREQUISITES: PHYT 6107, PHYT 6140

FORMATS: Lecture | Lab

### **PHYT 6502 Clinical Placement (Integrated Practice)**

CREDIT HOURS: 3

The clinical component of the program provides for the integration and application of learning in current academic studies to the clinical environment leading to the development of clinical competence. The student will gain understanding of the theoretical and practical application of physiotherapy in complex conditions in all practice areas. This builds upon the previous placements in cardiorespiratory, musculoskeletal and neurotherapeutics, and allows the student to assess and treat patients with multiple problems in co-morbidities. This will include the areas of geriatrics, pediatrics, private practice, industry, community practice, innovative practice and/or any area that enhances previous clinical and academic experience. Examples of placements are: - Geriatrics (Assessment, long term care or day hospital)-Home Care or Community Care-Regional Hospital for a mixture of In and Outpatient care-Pediatrics-Private Practice

PREREQUISITES: PHYT 6108

FORMATS: Lecture | Lab

### **PHYT 6503 Clinical Placement (Senior)**

CREDIT HOURS: 3

The clinical component of the program provides for the integration and application of learning in current academic studies to the clinical environment leading to the development of clinical competence. The purpose of the placement is to provide the student with an opportunity to learn consultation skills, to engage in program development and evaluation, and to educate others about the role of physiotherapy. Through working independently and advocating for their professional role, students learn skills that will serve them well as they enter the profession. Examples of placements/liaisons:-Injury Prevention-Chronic disease management-Primary Healthcare-Workers Compensation Board

PREREQUISITES: PHYT 6108

**PHYT 9000 Thesis**  
CREDIT HOURS: 0

# Planning

Location:  
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Phone Number: (902) 494-3260  
Fax Number: (902) 423-6672  
Email Address: [planning@dal.ca](mailto:planning@dal.ca)  
Website: [www.dal.ca/planning](http://www.dal.ca/planning)

## Introduction

The School of Planning is the hub of planning education in Atlantic Canada. The school offers two graduate degree programs in planning: the Master of Planning (MPlan), a first professional degree accredited by the Professional Standards Board for the planning profession in Canada and recognized by the Canadian Institute of Planners, and the research-focused, non-accredited Master of Planning Studies (MPS).

The Master of Planning (MPlan) program prepares students to become professional planners. Many graduates will work for private firms, for government, or in non-governmental organizations. Others will find that the education provides a solid foundation for careers in multidisciplinary spheres such as environmental protection, transportation planning, community development or urban design. Planning provides knowledge, a skill set, and a way of thinking with broad application. Applicants seeking a first-professional graduate degree in planning should consider the Master of Planning degree program.

The Master of Planning Studies (MPS) is a research-focused graduate degree that provides opportunities for graduate students to conduct advanced research in planning, contribute to the development of knowledge in the field, and complete sophisticated supervised research in the specialized field of study. The MPS program will appeal to highly qualified candidates who would like to pursue graduate thesis research in planning and obtain specific training in a specialized area within the discipline (e.g., transportation planning, climate change adaptation planning, urban design, etc.). Applicants must demonstrate capacity for advanced research and present a compelling research topic that matches the research expertise and interests of a faculty member in the School of Planning as part of their application. The Master of Planning Studies is not an accredited professional degree: it does not provide a direct route to the Planning profession for those without professional planning designation.

Planners are involved in activities that shape the future of communities, the quality of the environment, and the character of daily life. In their work for government, planners engage and motivate the public, help to develop a wide range of policies affecting the character and potential of communities, and act as guardians of the environment and of our built heritage. Working as consultants in the private sector, planners undertake a wide variety of tasks ranging from physical design and transportation planning, to creating strategies for sustainable or “smart” development. Planners work throughout the world, from the heart of Canada's towns and cities to the fields and villages of the developing countries.

The School of Planning encourages initiative, resourcefulness, and creative questioning of received doctrine. The curriculum of the school emphasizes: (a) specialized knowledge of theory and practice of planning; (b) up-to-date skills; (c) a sound appreciation of the environmental, social, and economic processes that shape the form and character of communities; (d) the active contribution of students in confronting and resolving contemporary planning problems in local communities; and (e) the development of personal capabilities suited to the leadership roles that planners assume.

Through environmental and community-centered learning, teaching, research and practice, faculty members and students in the school engage in the planning and design of settlements in various scales and contexts. Central to the professional planning program are studio courses (where learning is gained through working on real projects based in the community). Studio course content is delivered in a way that meets academic objectives within the practice of dealing with community planning issues. Thus the studio integrates theory and practice. Students also have opportunities to participate in field trips within the region and to international cities to learn about planning outside of Halifax.

## Staff

### Director

**Habib, M. A.**, BURP, MURP, (BUET), PhD (Toronto)

### Professor Emeriti

**Grant, J.**, BA (UWO), MA (McMaster), MA, PhD (Waterloo), FCIP

**Palermo, F.**, BArch (Toronto), MArchUD (Harvard), FCIP, LPP, FRAIC

### Professors

**Macedo, J.**, B.Arch&Urb (UFPR), MCP (UC), PhD (UF), AICP

**Manuel, P.**, BA (Carleton), MSc (McGill), PhD (Dalhousie), MCIP, LPP

### Associate Professors

**Habib, M. A.**, BURP, MURP, (BUET), PhD (Toronto)

**Rapaport, E.**, BSc (Wisconsin-Madison), MSc, PhD (RIT Stockholm), MCIP, LPP

### Assistant Professor

**Berglund, L.**, BSc (University of Michigan), MSc (Royal Institute of Technology), PhD (UCLA)

**Terashima, M.**, BSc (Michigan State), MSc (UBC), PhD (Dalhousie)

**Thomas, R.**, BLArch (Toronto), MA, PhD (UBC) MCIP RPP

### Instructor

**Hostovsky, C.**, BA (Toronto), MES (York), PhD (Waterloo), Cert (McMaster), MCIP, RPP

### Cross-appointed Faculty

**Beazley, K.**, major appointment in Resource and Environmental Studies

**Boxall, J.**, major appointment as Map and Geospatial Information Librarian, Killam Library

**Rainham, D.**, major appointment in Environmental Science, Faculty of Science

**Radice, M.**, major appointment in Sociology and Social Anthropology

**Wright, T.**, major appointment in College of Sustainability

### Adjunct (FGS)

**Allen, B.**, BComm (SMU), LLB (Dalhousie)

**Bergel A.**, BA (Columbia), MSc (NYU)

**Greene, K.**, BAH (Acadia), MURP (Dalhousie), MCIP, LPP

**Lovitt, N.**, OCD (Fanshawe), BCD (Dalhousie), DULE (UBC), LPP, MCIP, CPT

**McDonald, J.**, BSc (McGill), MSc (Guelph)

**Thompson, K.**, BSc (UPEI), BDes (NSCAD), MPS (Dalhousie)

**Whitcomb, C.**, BA (Guelph), MA (Waterloo)

## Admission Requirements

### Minimum Academic Requirements

The school seeks students with high scholastic standing and demonstrated academic interests or community experience pertinent to planning. All candidates must meet the Admissions Regulations of the Faculty of Graduate Studies (3.0 minimum cumulative GPA in a four-year undergraduate degree). In special circumstances where mature applicants are involved, applications supported by significant career experience may be considered.

### ***Master of Planning***

Admission to the MPlan program requires an undergraduate degree in any discipline with high scholastic standing. The MPlan is a first professional degree at the graduate level; an undergraduate degree in planning is not required for admission.

### ***Master of Planning Studies***

Admission to the MPS program requires one of the following:

- four-year undergraduate degree in planning
- four-year undergraduate degree in a related discipline (such as engineering, geography, geomatics, environmental sciences, architecture, etc.)
- four-year undergraduate degree in any subject with four years of planning work experience to make the candidate eligible for membership in a professional planning institute.

Entrance will be limited according to the school's ability to offer appropriate faculty supervision. Only those candidates with research interests compatible with those of faculty members will be eligible for admission. Enrolment may begin in either January or September.

### ***Inquiries***

Please contact the School of Planning or go to the school website for an application package and additional information about graduate programs in planning. (The school's telephone number, email address and website are shown at the beginning of this calendar section.) Please contact the Dalhousie University Registrar's Office for information on admission status or registration.

### ***Application Deadlines***

There is no cutoff date for the consideration of applications. However, candidates for MPlan should normally submit their application by January 31st. Admission is very competitive, and some scholarships are only available to highly qualified candidates whose application has been received by the 31st of January.

Students in the Master of Planning begin their courses in September. Only in exceptional circumstances are students permitted to enter the MPlan program at other times.

For the Master of Planning Studies (MPS) admission, applications may be considered at any time but can take at least two months to process. Candidates who apply by January 31st may be considered for some scholarships.

International applicants must ensure that their complete application has arrived by January 31st to allow sufficient time for visa processing.

### ***Transfer Students***

Applicants who have completed part of another graduate planning program may be considered for transfer credit by the Admissions Committee. A transfer student must complete a minimum of 30 credit hours of courses including PLAN 6000: Planning Project and Seminar (independent) within the MPlan program to qualify for the degree.

### ***English Language Competency***

Applicants whose native language is not English must meet the Faculty of Graduate Studies requirements for English Language Competency (see [FGS calendar section 3.4](#)). Students admitted to the program may be required to take further training in English in Canada, in the summer preceding the start of the program.

## **Academic Regulations**

In addition to the Faculty of Graduate Studies regulations, the following policies apply to the School of Planning.

### ***Readmission***

A student who wishes to be readmitted to the program after withdrawing or failing to register for three consecutive terms, must reapply as though he/she were a new applicant to the program.

### ***Transfer credits***

A student who wishes the school to consider transfer credits must apply no later than October 1 of the year the student enters the program. Graduate level credits earned outside of a completed degree program may be accepted as electives if (a) the school accepts them as electives relevant to a planning education, and (b) the student earned a grade of B or better.

# Master of Planning (MPlan)

The Masters program is a 20-month program with a work term in the summer (third) semester. The program consists of 45 credit hours of required course work, and 15 credit hours of elective course work. The work term is a non-credit co-op academic requirement. The program may also be completed through part-time study over a longer period of time (maximum seven years).

Because of the interactive nature of the core studio and course curriculum, students must be present on campus during the terms they register for required courses, except for the work term.

The required courses provide the fundamental elements of a planning education. They cover planning theory, history, practice, law, and methods, and provide community-based project experience that allows students to understand the institutional, social, and environmental contexts within which planners work. Courses allow students to develop planning skills and knowledge and to apply them to real community problems.

In the second year of the MPlan program, all students take on two major research-based projects: one individual and one team project.

The elective courses enable students to pursue individual interests and areas of specialized knowledge relevant to their studies in planning. Courses offered within the school focus on community design, urban design, environmental planning, land use planning, urban and environmental history, land economics, transportation planning, housing, and land development. Students must take at least half of their elective credit hours from offerings within the School of Planning.

Electives may be taken in other Dalhousie departments, or at other universities in Halifax, with the permission of the Graduate Coordinator. In some cases, elective credit hours may be given for suitable courses taken at other universities in Canada or abroad. Students wishing to take courses outside the school need permission of the Graduate Coordinator.

## Work Term

The program includes a work term (during the summer after the first academic year) that provides students with practical experience in planning. The Director of Career Services for the Faculty of Architecture and Planning assists students in preparing their search for suitable work term placements; students should note, however, that they are responsible for securing appropriate placements. In recent years, planning students have been employed throughout Atlantic Canada and most other Canadian provinces, and some have chosen to work abroad (e.g., in the United States and Europe). Students are encouraged to begin their search for work-term placements early in their first year of study in the program, and to be prepared to travel outside of the Halifax area to obtain work experience.

## Professional Certification

On completion of the MPlan degree and obtaining employment in planning, graduates are eligible to apply for Candidate membership in one of the Provincial or Territorial Institutes or Associations of professional planners as the first step to becoming a registered or licensed professional planner. The certification process that follows is administered on behalf of the institutes or the associations by the Professional Standards Board for the Planning Profession in Canada using national standards for certification. Foreign applicants are advised to contact the Professional Standards Board about requirements for professional registration.

# Master of Planning Studies (MPS)

The Master of Planning Studies (MPS) program is a research-oriented graduate degree intended for highly qualified applicants who wish to conduct graduate thesis research in planning. The program consists of 15 credit hours of course work and a thesis. The program may be completed in 12 to 24 months of full-time study, or a longer period of time for part-time study (up to five years).

The curriculum includes compulsory and elective courses. The compulsory courses are PLAN 6505.03: Seminar: Theories, Ideas, Debates in Planning, and PLAN 8000.06: MPS Thesis Proposal. The student selects an additional six credit hours of elective courses based on the needs and interests of the graduate student to support the thesis research focus. One of the elective courses must be a graduate-level research methodology course chosen from the approved list of methodology courses or another methods course with the approval of the thesis supervisor and graduate coordinator.



Students select a thesis topic in consultation with the thesis supervisor. PLAN 9000.00: Master of Planning Studies Thesis is a requirement for the MPS degree. Students must complete a thesis to the satisfaction of the thesis supervisory committee and in accordance with the rules and procedures of the Faculty of Graduate Studies.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Offerings

### Course Offerings

Some required subjects may be interchanged between academic terms or years, depending on the availability of instructors. Elective courses are not offered every year.

The school attempts to schedule electives to be available at least once within a two-year period; when possible. Some courses have enrollment limits or pre-requisites.

### *Other Electives*

Students should discuss their elective choices with their faculty advisor.

Up to half of the elective credits may be taken outside the school. All such choices need the approval of the Graduate Coordinator, and if the course is at another university, a Letter of Permission must be completed before the student enrolls in the course.

Up to two senior level (3000, 4000) undergraduate courses may be included in the program if comparable graduate courses are not available. Students need the permission of the Graduate Coordinator to register for undergraduate courses.

No more than two Directed Studies courses may be included in the program. Students need the permission of the Graduate Coordinator to register for a Directed Studies course.

## Course Notes

### Course Numbers

Graduate courses are at the 5000 level and above. When courses are cross listed with senior undergraduate courses, graduate students must enroll under the graduate number. In such courses, the assignments and expectations are modified appropriately for graduate work.

### Planning Courses

Students in the MPlan program take 60 credit hours, or equivalent, and complete a work term. The distribution of courses throughout the two years of the planning program is outlined below.

Full-time students normally register for 12 to 18 credit hours per semester. Course credit hours are shown after the decimal place in the course number: e.g., “.03” means three credit hours; in a one-semester lecture course, the number of credit hours is roughly equal to the weekly contact hours; there is an expectation of about double that time of work outside course hours. Note that studio courses are six credit hours, though only one semester long.

**Required courses: 45 credit hours (11 courses)**

- PLAN 5000.06: Planning Studio 1
- PLAN 5035.03: Application of Planning Law
- PLAN 5101.03: History and Philosophy of Planning
- PLAN 5102.03: Planning Practice
- PLAN 5201.00: Work Term (non-credit)
- PLAN 5303.03: Planning Methods
- PLAN 5304.03: Planning Research Methods
- PLAN 5500.06: Planning Studio 2
- PLAN 6000.09: Planning Project and Seminar
- PLAN 6500.06: Integrative Team Project
- PLAN 6505.03: Seminar on Theories, Ideas, and Debates in Planning
- Elective credits: 15 credit hours (five half courses, or equivalent).

Students select 15 credit hours of electives over the course of their studies.

### ***Program of Study for Master of Planning***

#### **Year 1 - Term 1 (Fall)**

- PLAN 5000.06: Planning Studio 1
- PLAN 5101.03: History and Philosophy of Planning
- PLAN 5102.03: Planning Practice
- PLAN 5303.03: Planning Methods
- electives

#### **Year 1 - Term 2 (Winter)**

- PLAN 5035.03: Application of Planning Law
- PLAN 5304.03: Planning Research Methods
- PLAN 5500.06: Planning Studio 2
- electives

#### **Year 1 - Term 3 (Summer)**

- PLAN 5201.00: Work Term

#### **Year 2 - Term 4 (Fall)**

- PLAN 6000.09: Planning Project and Seminar
- electives

#### **Year 2 - Term 5 (Winter)**

- PLAN 6500.06: Integrative Team Project
- PLAN 6505.03: Seminar: Theories, Ideas, and Debates in Planning
- electives

#### **Planning Electives**

- PLAN 5005.03: Cities and the Environment in History
- PLAN 5015.03: Site Infrastructure
- PLAN 5020.03: Landscape Design
- PLAN 5025.03: Representation in Design
- PLAN 5040.03: Reading the Suburbs
- PLAN 5050.03: Topics in Community Design
- PLAN 6101.03: History and Theory of Urban Design

- PLAN 6103.03: Urban Ecology
- PLAN 6105.03: Land Development Economics
- PLAN 6106.03: Transportation Planning
- PLAN 6108.03: History and Theory of Landscape Architecture
- PLAN 6111.03: Housing Theory
- PLAN 6120.03: Citizen Engagement and Consultation
- PLAN 6125.03: Negotiation and Conflict Management
- PLAN 6150.03: Topics in Planning
- PLAN 6201.03: Directed Studies
- PLAN 6202.03: Directed Studies 2
- PLAN 6250.015 - PLAN 6253.015: Field Trip: Maritimes
- PLAN 6255.015 - PLAN 6258.015: Field Trip: International
- PLAN 6304.015 (to PLAN 6309.015) Mid-term Conference Module
- PLAN 6600.06: Special Project Studio
- PLAN 6601.06: Special Project Studio: Environmental Planning
- PLAN 6602.06: Special Project Studio: Urban Design

### ***Program of Study for Master of Planning Studies***

The program consists of 15 credit hours of courses and a thesis.

#### **Compulsory courses: 9 credit hours**

- PLAN 6505.03: Seminar in Theories, Ideas and Debates in Planning
- PLAN 8000.06: MPS Thesis Proposal

#### **Elective courses: 6 credit hours**

- graduate-level research methodology course
- elective

#### **Approved Research Methodology courses**

- PLAN 5303.03: Planning Methods
- PLAN 5304.03: Planning Research Methods
- ENGM 6671.03: Applied Regression Analysis
- CIVL 6139.03: Transport Operations
- INTE 7100.03: Research Methods from management, policy, and science
- OCCU 5030.03: Advanced Research Theory and Methods for Occupational Therapy
- ENVI 5001.03: Environmental Assessment
- PLAN 6106.03: Transportation Planning

Other methods courses may be considered depending on the student's research interests and the course offerings at Dalhousie in a given year (alternatives require approval).

### ***Sample Program***

#### **Scenario A**

	Fall	Winter	Summer
Year 1	Methodology course	PLAN 6505.03: Seminar	PLAN 9000.00: Thesis
	Elective	PLAN 8000.06: Thesis Proposal	
Year 2	PLAN 9010.03: Thesis continuation		

## Scenario B

	Fall	Winter	Summer
	Methodology course	PLAN 6505.03: Seminar	
Year 1	PLAN 8000.06: Thesis	elective	PLAN 9000.00: Thesis
Year 2	Elective PLAN 9010.03: Thesis continuation	[thesis research]	

## Scenario C

	Fall	Winter	Summer
		PLAN 6505.03: Seminar	
Year 1		Methodology course	PLAN 8000.06: Thesis proposal
		elective	[thesis research]
Year 2	PLAN 9000.00: Thesis	PLAN 9010.03: Thesis continuation	

Actual sequencing may change on time of admission and length of time for preparation of a thesis. Students will determine the appropriate sequence for them in consultation with the Supervisor.

# Course Descriptions

## PLAN 5000 Planning Studio 1

CREDIT HOURS: 6

The studio introduces land planning and development. The course investigates fundamental aspects of planning in community and environmental context in the urban region. Specific community projects are used to explore the procedural, physical, social, and polemical context for decision making; to apply skills in information gathering, analysis, and synthesis; to develop communication techniques. The course will concentrate on documenting the existing situation, formulating strategies for intervention, developing concepts and plans, and assessing the consequences of proposed changes.

RESTRICTIONS: Master of Planning students or permission of instructor

FORMATS: Seminar | Studio

## PLAN 5005 Cities and the Environment in History

CREDIT HOURS: 3

The contemporary landscape reflects a long history of human activities on the land, and design and planning interventions through time. Civilizations rise and fall, often because of their degradation of the ecosystems that support them. This course examines the relationship of cities with the environment to enhance our understanding of landscape change, urban form, and patterns in human settlements through the ages.

CROSSLISTED: PLAN 3005.03

FORMATS: Lecture | Seminar

## PLAN 5012 Reading the City

CREDIT HOURS: 3

Any city reflects the history of its topography, cultural traditions, and design interventions. This course introduces the principles, theories, and methods of urban form analysis in the local urban context. Students explore the local urban environment to interpret what the city means, and how it comes to take the shape it does.

CROSSLISTED: PLAN 3002.03

FORMATS: Lecture | Seminar

**PLAN 5015 Site Infrastructure**

CREDIT HOURS: 3

The course examines the role of infrastructure in community design and site planning. Students are introduced to principles of grading, access, service provision, and cost estimating. Key exercises allow students to apply theory to practical projects.

CROSSLISTED: PLAN 3015.03

FORMATS: Lecture | Lab

**PLAN 5020 Landscape Design**

CREDIT HOURS: 3

The course introduces principles and methods of site design. It pays special attention to social, natural, and technical components as factors in adapting sites for human use. Practical projects allow students to develop deeper insight into the challenges and opportunities of landscape design.

CROSSLISTED: PLAN 3020.03

FORMATS: Lecture | Lab

**PLAN 5025 Representation in Design**

CREDIT HOURS: 3

The course explores techniques of representation in community design work. It examines design drawing conventions such as orthographic, praline, and perspective projections. It helps students develop their awareness of design approaches and their skills in design presentation.

CROSSLISTED: PLAN 3025.03

FORMATS: Lecture | Lab

**PLAN 5035 Application of Planning Law**

CREDIT HOURS: 3

This course explores the application of planning law in the field of community-planning. It introduces students to the legal processes and statutory requirements for land use planning in Canada, with particular reference to Nova Scotia.

PREREQUISITES: Master of Planning program

CROSSLISTED: PLAN 4035.03

FORMATS: Lecture

**PLAN 5040 Reading the Suburbs**

CREDIT HOURS: 3

An increasing proportion of Canadians live in the suburbs. This course explores issues related to planning and designing the suburbs and develops techniques for analyzing and developing community form in the suburban environment.

CROSSLISTED: PLAN 3040.03

FORMATS: Lecture

**PLAN 5050 Topics in Community Design**

CREDIT HOURS: 3

This course provides opportunities to examine selected topical issues in community design.

CROSSLISTED: PLAN 3050.03

FORMATS: Lecture | Seminar

**PLAN 5051 Topics in Community Design 2**

CREDIT HOURS: 3

This course provides opportunities to examine selected topical issues in community design.

CROSSLISTED: PLAN 3051.03

FORMATS: Lecture | Seminar

### **PLAN 5052 Topics in Community Design 3**

CREDIT HOURS: 3

This course provides opportunities to examine selected topical issues in community design.

CROSSLISTED: PLAN 3052.03

FORMATS: Lecture | Seminar

### **PLAN 5053 Topics in Community Design 4**

CREDIT HOURS: 3

This course provides opportunities to examine selected topical issues in community design.

CROSSLISTED: PLAN 3053.03

FORMATS: Lecture | Seminar

### **PLAN 5101 History and Philosophy of Planning**

CREDIT HOURS: 3

The course offers an intensive examination of traditions, ideas, and philosophies that provide an underpinning to contemporary planning. The course traces the historic development of modern planning (since the late 19th century) and examines the philosophical foundations of the planning profession.

RESTRICTIONS: Master of Planning students or permission of instructor

FORMATS: Lecture | Seminar

### **PLAN 5102 Planning Practice**

CREDIT HOURS: 3

The course explores the role of the planner and the planning process through lectures, seminars and case studies. The focus is on understanding the institutional framework for planning, including social, political, and economic dimensions; examining approaches to community involvement, negotiation, and policy formulation; and developing effective communication skills. It will consider significant current issues facing planners (including ethical questions).

RESTRICTIONS: Master of Planning students, or permission of instructor

FORMATS: Lecture | Seminar

### **PLAN 5104 Planning Law**

CREDIT HOURS: 3

The course introduces the legislation, case law, and government authority applicable to planning and development control. Zoning and subdivision controls, development control, expropriation, planning appeals and the process of establishing and implementing plans will be examined. Attention is paid to the roles of all the primary players in planning: private citizens, special interest groups, corporations, and municipal, provincial and federal government departments.

RESTRICTIONS: Master of Planning students, or permission of instructor. Note: This course is offered by the Faculty of Law

FORMATS: Lecture | Seminar

### **PLAN 5115 Social Justice**

CREDIT HOURS: 3

This is a seminar exploring principles and theories of social justice as they apply to planning practice and research. The course is designed to develop an understanding of how theoretical understandings of equity, diversity, inclusiveness, affordability and social justice influence planning processes, plans, and policies. Students will study specific tools and strategies that municipalities, non-profit and community-based organizations and other actors use to address complex and long-standing issues of social justice. Students will engage with and respond to a variety of guest lecturers, videos, films, and other resources.

CROSSLISTED: PLAN 3115

RESTRICTIONS: Students must have completed 60 credit hours to enroll in this course.

FORMATS: Seminar

### **PLAN 5201 Work Term**

CREDIT HOURS: 0

The work term provides an opportunity for students to integrate practical work experience within the educational environment. A student must complete a work term of not fewer than 15 weeks (at least 500 hours) in an employment placement approved by the School of Planning. The student maintains a work journal during the work term and prepares a synthesis paper at the end of the work term reflecting on the lessons learned during the work term. The student makes a presentation within the school upon completion of the work.

RESTRICTIONS: Master of Planning students

### **PLAN 5303 Planning Methods**

CREDIT HOURS: 3

The course introduces methods used in planning. This may include spatial analysis, population forecasting, survey methods, computer tools, and other appropriate techniques.

RESTRICTIONS: Master of Planning students or permission of instructor

EXCLUSIONS: PLAN 5301.015

FORMATS: Lecture | Seminar

### **PLAN 5304 Planning Research Methods**

CREDIT HOURS: 3

The course provides an overview of planning and research methods and research design. This includes techniques for qualitative, quantitative, and mixed methods approaches to data collection and analysis. Each student will develop a proposal for conducting an independent planning project.

RESTRICTIONS: Master of Planning students or permission of instructor

EXCLUSIONS: PLAN 5302.015

FORMATS: Lecture | Seminar

### **PLAN 5500 Planning Studio 2**

CREDIT HOURS: 6

The studio continues the lessons of Studio 1. The studio adopts an environmental perspective in approaching planning issues and challenges. The course will concentrate on techniques of evaluating the suitability of land for proposed land uses, and methods of assessing the impacts of proposed planning policies and developments on landscapes.

PREREQUISITES: PLAN 5000

RESTRICTIONS: Master of Planning students or permission of instructor

FORMATS: Seminar | Studio

### **PLAN 6000 Planning Project and Seminar**

CREDIT HOURS: 9

Each student completes an independent planning project under the guidance of a project supervisor and participates in the weekly planning project seminar with the course instructor. The course provides an opportunity for independent research and analysis in a community-based planning project context. The seminar provides an opportunity for reflection on the connections between theory and practice and sets challenges and deadlines for project completion.

Students present their work at several points during the term.

PREREQUISITES: PLAN 5500.06, 5304.03

FORMATS: Seminar | Studio

### **PLAN 6007 GIS Applications in Planning**

CREDIT HOURS: 3

Planners use Geographical Information Systems (GIS) for data collection, coordination, and analysis; to properly interpret and use GIS data to inform decision-making. This course explores the application of GIS in planning within a project-centred setting. Students learn to use GIS to address and use and site planning issues. The course also considers mapping standards used within the field of planning, and examines legal, privacy, and ethical implications of using GIS data in the public realm.

### **PLAN 6101 History and Theory of Urban Design**

CREDIT HOURS: 3

The course introduces the history and theory of urban design as a distinct area of professional knowledge and skill within the spectrum of planning and design concerns and specialties.

CROSSLISTED: PLAN 4101.03

RESTRICTIONS: Honours or graduate students in the Faculty of Architecture and Planning, or permission of instructor

FORMATS: Lecture | Seminar

### **PLAN 6103 Urban Ecology**

CREDIT HOURS: 3

More than three-quarters of Canadians, and more than half the world's population, now live in urban settings. This course treats the urban system as habitat made by and for people and takes an ecological approach to the flows of energy and materials which make urban life possible. Students study their own behaviour and surroundings, comparing their observations with data from Canada, North America, and the rest of the world. This leads to discussions about the health and sustainability of urban communities.

CROSSLISTED: PLAN 3010.03

FORMATS: Lecture | Seminar

### **PLAN 6105 Land Development Economics**

CREDIT HOURS: 3

This course applies basic techniques for analyzing the financial feasibility of land development projects. Case studies focus particular attention on methods of financing and organizing real-estate development within the planning framework.

CROSSLISTED: PLAN 4105.03

RESTRICTIONS: Graduate students in the Faculty of Architecture and Planning, or permission of instructor

FORMATS: Lecture | Seminar

### **PLAN 6106 Transportation Planning**

CREDIT HOURS: 3

This course analyses transportation trends, the transport needs associated with different activities and the impact of transport facilities on land development to offer a critical analysis of the interplay between land uses and transportation. Technology, the costs of supplying transport facilities and the demand outlook for different modes are examined. The emphasis is on urban transportation, mobility demands and the supply of efficient and environmentally sound transport facilities.

CROSSLISTED: PLAN 4106.03

RESTRICTIONS: Graduate students in the Faculty of Architecture and Planning, or permission of instructor

FORMATS: Lecture | Seminar

### **PLAN 6108 History and Theory of Landscape Architecture**

CREDIT HOURS: 3

The course deals with changing landscapes and perceptions of the natural world during the past 250 years. It discusses the effects of technology and resource use on the design of landscapes as small as a private garden and as large as a bioregion, and examines the changing role of landscape architects, their writings, and their collaboration with architects and planners.

CROSSLISTED: PLAN 4108.03

RESTRICTIONS: Graduate students in the Faculty of Architecture and Planning, or permission of instructor

FORMATS: Lecture | Seminar

### **PLAN 6111 Housing Theory**

CREDIT HOURS: 3

An introduction to the history and theory of contemporary practice in housing design and production. The focus is on the quality of housing and the residential environment. A comparative analysis of significant past and current examples is used to provide insight into the way houses and neighborhoods are designed. This understanding is placed in the context of differing economic, political, and housing market situations.

CROSSLISTED: ARCH 5102.03, PLAN 4111.03

RESTRICTIONS: Graduate students in the Faculty of Architecture and Planning, or permission of instructor

FORMATS: Lecture | Seminar

### **PLAN 6120 Citizen Engagement and Consultation: The Opportunities and Challenges of Public Engagement**

CREDIT HOURS: 3

This course examines the conceptual foundations and practice of citizen participation, especially in the context of planning and development decisions by municipal and provincial governments, and the techniques or methods that can be used to more effectively involve individual citizens and stakeholder groups in community decisions.

CROSSLISTED: PLAN 4120.03, PUAD 6120.03

### **PLAN 6125 Negotiation and Conflict Management: Personal Practice Foundations**

CREDIT HOURS: 3

This course explores the world of interpersonal communication, conflict and negotiation and the variety of approaches and range of skills needed to solve



problems, reach agreements, and maintain relationships. It will enable participants to understand the positive and negative dimensions of conflict, analyze the dynamics of formal and informal negotiations, and interact with others with greater awareness, intention, and skill.

PREREQUISITES: Permission of graduate or undergraduate advisor, and instructor

CROSSLISTED: PLAN 4125.03, MGMT 4610.03

FORMATS: Lecture

### **PLAN 6150 Topics in Planning**

CREDIT HOURS: 3

6151.03, 6152.03, 6153.03 This course provides opportunities to examine selected topical issues in planning in a seminar discussion.

CROSSLISTED: PLAN 4150.03

RESTRICTIONS: Graduate students in the Faculty of Architecture and Planning, or permission of instructor

FORMATS: Seminar

### **PLAN 6201 Directed Studies**

CREDIT HOURS: 3

A student wishing to pursue an advanced aspect of planning study for which no suitable course is offered may request a Directed Studies. The course is taken under a School of Planning faculty member.

RESTRICTIONS: Master of Planning students or permission of Director of School of Planning

### **PLAN 6202 Directed Studies 2**

CREDIT HOURS: 3

A student wishing to pursue an advanced aspect of planning study for which no suitable course is offered may request a second Directed Studies course. The course is taken under a School of Planning faculty member. No further directed studies are permitted.

PREREQUISITES: PLAN 6201.03

RESTRICTIONS: Master of Planning students, permission of Director of School of Planning

### **PLAN 6250 Field trip: Maritimes 1**

CREDIT HOURS: 1.5

This intensive course involves a field trip within the Maritimes region to explore the current and historic state of planning in the region.

RESTRICTIONS: Master of Planning students or permission of the instructor

### **PLAN 6251 Field Trip: Maritimes 2**

CREDIT HOURS: 1.5

This intensive course involves a field trip within the Maritimes region to explore the current and historic state of planning in the region.

RESTRICTIONS: Master of Planning Students

### **PLAN 6252 Field Trip: Maritimes 3**

CREDIT HOURS: 1.5

This intensive course involves a field trip within the Maritimes region to explore the current and historic state of planning in the region.

RESTRICTIONS: Master of Planning Students

### **PLAN 6253 Field Trip: Maritimes 4**

CREDIT HOURS: 1.5

This intensive course involves a field trip within the Maritimes region to explore the current and historic state of planning in the region.

RESTRICTIONS: Master of Planning Students

### **PLAN 6255 Field trip: International 1**

CREDIT HOURS: 1.5

This intensive course involves a field trip to an international city to explore the current and historic state of planning in the city.

RESTRICTIONS: Master of Planning students or permission from the Director of School of Planning

### **PLAN 6256 Field Trip: International 2**

CREDIT HOURS: 1.5

This intensive course involves a field trip to an international city to explore the current and historic state of planning in the city.

RESTRICTIONS: Master of Planning Students, or permission from the Director of School of Planning

### **PLAN 6257 Field Trip: International 3**

CREDIT HOURS: 1.5

This intensive course involves a field trip to an international city to explore the current and historic state of planning in the city.

RESTRICTIONS: Master of Planning Students, or permission from the Director of School of Planning

### **PLAN 6258 Field Trip: International 4**

CREDIT HOURS: 1.5

This intensive course involves a field trip to an international city to explore the current and historic state of planning in the city.

RESTRICTIONS: Master of Planning Students, or permission from the Director of School of Planning

### **PLAN 6304 Mid-Term Conference Module**

CREDIT HOURS: 1.5

NOTE: Course Details listed here also apply to PLAN 6305/PLAN 6306/PLAN 6307/PLAN 6308/PLAN 6309.

RESTRICTIONS: Graduate students in the Faculty of Architecture and Planning, or permission of instructor

### **PLAN 6305 Mid-Term Conference Module 2**

CREDIT HOURS: 1.5

See PLAN 6304.

### **PLAN 6306 Mid-Term Conference Module 3**

CREDIT HOURS: 1.5

See PLAN 6304.

### **PLAN 6307 Mid-Term Conference Module 4**

CREDIT HOURS: 1.5

See PLAN 6304.

### **PLAN 6308 Mid-Term Conference Module 5**

CREDIT HOURS: 1.5

See PLAN 6304.

### **PLAN 6309 Mid-Term Conference Module 6**

CREDIT HOURS: 1.5

See PLAN 6304.

### **PLAN 6500 Integrative Team Project**

CREDIT HOURS: 6

In the final semester, students form small consulting teams to undertake complex planning projects for community, government, or corporate clients. Projects and clients are selected by students and represent their wide range of interests. A common thread is the process to develop, document and communicate strategies and methods of implementation.

PREREQUISITES: PLAN 6000.09

FORMATS: Studio

### **PLAN 6505 Seminar: Theories, Ideas, and Debates in Planning**

CREDIT HOURS: 3

The final capstone course provides a venue for debate and discussion about theory, ethics, ideas, and contemporary issues in planning. It considers the relationship between theory and practice and allows students to reflect on the profession they are about to join.

PREREQUISITES: PLAN 5500.03

RESTRICTIONS: Restricted to graduate students in the Faculty of Architecture and Planning or permission of the instructor.

FORMATS: Lecture | Seminar

### **PLAN 6600 Special Project Studio**

CREDIT HOURS: 6

The studio provides an opportunity for in-depth examination of a community-based planning project.

RESTRICTIONS: Graduate students in the Faculty of Architecture and Planning, or permission of instructor

FORMATS: Seminar | Studio

### **PLAN 6601 Special Project Studio: Environmental Planning**

CREDIT HOURS: 6

The studio provides an opportunity for in-depth examination of a community-based environmental planning project. Note: Graduate students registering for this course need appropriate background in landscape analysis and environment planning.

PREREQUISITES: PLAN 5500.06 and permission of instructor

CROSSLISTED: PLAN 4001.06

RESTRICTIONS: Graduate students

FORMATS: Lecture | Lab | Studio

### **PLAN 6602 Special Project Studio: Urban Design**

CREDIT HOURS: 6

The studio provides an opportunity for in-depth examination of a community-based urban design project.

PREREQUISITES: PLAN 5500.06

CROSSLISTED: PLAN 4002.06

RESTRICTIONS: Graduate students in the Faculty of Architecture and Planning, or permission of instructor.

FORMATS: Lecture | Lab | Studio

### **PLAN 8000 MPS Thesis Proposal**

CREDIT HOURS: 6

Under the supervision of the thesis supervisor and thesis committee, a student in the Master of Planning Studies program prepares a thesis proposal that outlines the research question, background literature review and synthesis, approach, methods (of data collection and analysis), ethical implications, and schedule of work. The student gives a public presentation of the thesis proposal, and an oral defence before the thesis committee.

PREREQUISITES: Admission to Master of Planning Studies programme

### **PLAN 9000 Master of Planning Studies Thesis**

CREDIT HOURS: 15

Under the supervision of the thesis supervisor and thesis committee, a student in the Master of Planning studies program prepares a thesis that investigates an original and significant question in planning research. The student gives a public presentation of the thesis research, and an oral defence of the thesis before the thesis committee.

PREREQUISITES: Admission to the Master of Planning Studies programme, PLAN 8000

RESTRICTIONS: Limited to students in the Master of Planning Studies Programme

## PLAN 9010 MPS Thesis Continuation

CREDIT HOURS: 0

When a thesis committee grades the course PLAN 9000.15 as "In Progress", the student registers for PLAN 9010.00 each fall and winter semester until the thesis is successfully defended and completed.

PREREQUISITES: Plan 9000 graded as IP

RESTRICTIONS: Limited to students in the Master of Planning Studies programme who have earned IP in Plan 9000.15

## Political Science

Location:

Henry Hicks Arts and Administration Building

6299 South Street

Room 301

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-2396

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Email Address: [psgrad@dal.ca](mailto:psgrad@dal.ca)

Website: [politicalscience.dal.ca](http://politicalscience.dal.ca)

## Staff

### Chairperson of Department

**Black, D.**

### Graduate Coordinator

**Fierlbeck, K.**

### Professors

**Black, D.**, BA (Trent), MA, PhD (Dalhousie). Canadian and comparative foreign policy; Southern Africa; North-South relations; International Development

**Bow, B.**, BA (UBC), MA (York), PhD (Cornell). International Relations; International Diplomacy and Institutions; International Political Economy; Foreign Policy; Canada-US Relations

**Fierlbeck, K.**, BA (Alta), MA (York), PhD (Cantab). Political theory, health policy and democratic theory

**Finbow, R. G.**, BA (Dalhousie), MA (York), MSc, PhD (London). Comparative politics (Western democracies [Latin America]); Comparative theory; Canadian regionalism

**Harvey, F.**, BA, MA, PhD (McGill). Theories of international relations; International conflict and crises; comparative foreign policy; American foreign policy; Canada - US relations

### Associate Professors

**Arthur, P.**, BA (Ghana), MSc (LSE), MA (WLU), PhD (Queen's). Comparative Politics (African Politics), Development, Foreign Policy

**Carbert, L.**, BA (Alta), MA, PhD (York). Political behaviour; Elections; Women and Politics

**Denike, M.**, BA (Simon Fraser), MA (UBC), LL.M (Queen's), PhD (York). Western political theory; Human rights; Philosophies of law; Feminist Theory; Queer Theory

**Good, K.**, BA, MA (Man), PhD (Toronto). Urban and suburban governance in Canada, Canadian federalism and multi-level governance, Canadian public policy, race relations in Canada

**Hayden, A.**, BA (McGill), MES (York), PhD (Boston College). Environmental and Climate Politics; Politics of Consumption, Political Economy

**Zaiotti, R.**, BA (Bologna), MA (Oxford), PhD (Toronto). European Union; International Relations Theory; International Security; Border control and Immigration Policy; Transatlantic relations

### Assistant Professor

**Banerjee, K.**, BA, MA (Chicago), PhD (Toronto). Global Justice and International Ethics; Forced Migration and Refugee Studies; Normative Political Theory and History of Political Thought; Law and Legal Theory; International Relations Theory; Theories of Citizenship, Immigration, and Membership.

**Pruysers, S.**, BA, MA (Waterloo), PhD (Carleton). Canadian Politics; Political Parties and Systems; Political Psychology; Political Participation; Gender; Representation.

**Sarson, L.**, BSocSc (UOttawa), MA (Waterloo), PhD (Queens). International Relation; Indigenous Global Politics; Canadian Foreign Policy; Arctic Studies; Gender and International Relations.

### **Cross-listed Faculty**

**Cameron, J.**, International Development Studies, Dalhousie University

**Dodd, S.**, University of King's College

**Huish, R.**, International Development Studies, Dalhousie University

**Kow, S.**, University of King's College

**Mannathukkaren, N.**, International Development Studies, Dalhousie University

**Parasram, A.**, International Development Studies, Dalhousie University

**Robertson, N.**, University of King's College

**Turnbull, L.**, BA, MA, PhD (Dalhousie). Canadian Politics with specific focus on ethics, parliament, and citizen engagement.

### **Adjunct (FGS)**

**Abelson, D.**, Mulroney Institute, St. Francis Xavier University

**Atkison, L.**, Dalhousie University

**Bail, F.**, Dalhousie University

**Batt, S.**, Dalhousie University

**Bickerton, J.**, St. Francis Xavier University

**Eichler, M.**, Mount Saint Vincent University

**El-Masri, S.**, Dalhousie University

**Eren Vural, I.**, Dalhousie University

**Kenyon, K.**, University of Winnipeg

**Lehre, E.**, Dalhousie University

**Levesque, M.**, Mount Allison

**Levin, J.**, St. Francis Xavier University

**McGibbon, E.**, St. Francis Xavier University

**Savard, J-F.**, École nationale d'administration publique

**Savoie, D.**, Université de Moncton

**Shaw, T.**, University of Massachusetts

**Smith, H.**, University of Northern BC

**Stienstra, D.**, University of Manitoba

**Whitman, S.**, Dalhousie University

## **Admission Requirements**

Applicants must satisfy the minimum requirements set by the Faculty of Graduate Studies.

Successful applicants for the MA program will normally have an Honours BA in Political Science, or its equivalent, with first-class standing (GPA of 3.70 or higher).

Admission decisions are based on academic transcripts, letters of reference, a sample of written work, statement of research interest submitted by the applicant, and the capacity of the Department to supervise a thesis in the applicant's proposed field of research.

Successful applicants for the PhD program will normally have an MA in Political Science with first-class standing (GPA of 3.70 or higher). Admission decisions are based on the same considerations that apply to the MA program, but PhD students are admitted only when a faculty member is prepared to supervise the applicant's program, including the proposed thesis topic.

Applicants who do not meet all of the above requirements, but who have superior academic qualifications, may be considered for admission to the graduate program.

Applicants whose native language is not English must demonstrate a minimum of 600 for the written TOEFL/100 for the internet-based test, or IELTS with an outcome of 7.5. The language competency test may be waived if the applicant has completed a degree at a recognized university where the language of instruction is English and where English is one of the official languages of the country.

## Master of Arts (MA)

The MA is a one-year (12 month) program consisting of 18 credit hours and a thesis. A candidate for the degree Master of Arts in Political Science will require at least 12 months of full-time study to complete all degree requirements. Courses normally include at least 6 of the 18 required credit hours in core graduate seminars (International Relations, Canadian, Comparative or Theory), 3 credits in Research Methods class (POLI 5100.03), and the remaining 9 credit hours in graduate courses in any field. 6 of these remaining 9 credit hours can be taken as reading classes, or from courses in other departments (with permission of the instructor and Graduate Coordinator).

## Doctor of Philosophy (PhD)

The PhD program requires two years of full-time residency and is expected to be completed within four years. Students must take 9 credit hours of core courses in their area of research (International Relations, Canadian, Comparative or Theory), and 3 credit hours in a research methods class (POLI 5100.03). The two principal requirements consist of comprehensive examinations in two fields (a major and minor field) and an original thesis. Course work will be required as appropriate to prepare the student for her or his comprehensive examinations. These examinations will include both written and oral components. Before proceeding to the thesis, a student must present and defend a thesis proposal. Also, reading competence in a second language, usually French, must be demonstrated before the student defends his or her dissertation proposal. The thesis is written under the direction of a committee comprising of the supervisor and two other members and may include qualified faculty members from other departments and other universities. The completed thesis is subject to a public, oral defence.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

Courses offered by the Department are organized into four fields, as follows:

- Canadian Politics
- Comparative Politics
- International Relations and Foreign Policy
- Political Theory

Each field (with the exception of Political Theory) contains courses offered as core graduate seminars, and courses cross-listed at the upper undergraduate level. Graduate students will be required to satisfy appropriately higher standards. In addition, directed reading courses may be arranged on an individual or small group basis with appropriate faculty members. Reading courses are particularly appropriate in areas closely related to a student's thesis research and are often offered by a student's thesis supervisor.

Note: Not all courses are offered every year. Please consult the current timetable for this year's offerings.

### Canadian Government and Politics

### ***Core Graduate Seminars:***

- POLI 5207.03: Advanced Seminar in Canadian Politics

### ***Cross-listed Courses***

- POLI 5221.03: Canadian Parties in Comparative Perspective
- POLI 5232.03: Urban Governance in Canada
- POLI 5234.03: Canadian Urban Politics in Comparative Perspective
- POLI 5240.03: Introduction to Public Policy
- POLI 5241.03: Introduction to Policy Analysis
- POLI 5242.03: Politics of Reason, Passion, and Biology
- POLI 5250.03: Canadian Public Administration
- POLI 5260.03: The Politics of Health Care

## **Comparative Politics**

### ***Core Graduate Seminars:***

- POLI 5301.03: Comparative Theory
- POLI 5340.03: Approaches to Development

### ***Cross-listed Courses:***

- POLI 5302.03: Comparative Development Administration
- POLI 5303.03: Human Rights and Politics
- POLI 5322.03: The EU as a Global Actor
- POLI 5355.03: Comparative Perspective on the Development State
- POLI 5345.03: Politics of Southern Africa
- POLI 5380.03: Politics of Climate Change

## **Political Theory and Methodology.**

### ***Cross-listed Courses:***

- POLI 5403.03: Human Rights: Philosophical Issues
- POLI 5440.03: The Politics of Affect: Theories of Emotion and Political Life
- POLI 5450.03: Political Theories of International Ethics and Global Justice
- POLI 5466.03: The Social and Political Constructions of Health and Medicine
- POLI 5479.03: Classical Liberalism and Democracy
- POLI 5481.03: Theories of Violence, Persecution and Genocide

## **International Relations and Foreign Policy**

### ***Core Graduate Seminars:***

- POLI 5523.03: International Relations Theory 1: Order, Conflict and Change
- POLI 5524.03: International Relations Theory 2: Cooperation, Institutions and Development

### ***Cross-listed Courses:***

- POLI 5532.03: Indigenous Global Politics
- POLI 5550.03: Japanese Foreign Policy
- POLI 5560.03: Issues in Global Security and Development
- POLI 5561.03: Security Development Nexus; Theory, Policy & Complex Operations

- POLI 5565.03: Contemporary Security Studies
- POLI 5569.03: Canadian Foreign Policy
- POLI 5575.03: Nuclear Weapons and Arms Control in World Politics
- POLI 5581.03: International Diplomacy: Institutions and Practices
- POLI 5587.03: International Political Economy
- POLI 5589.03: Politics of the Sea II

## Research Seminar

- POLI 5100.03: Research Methods and Design

## Directed Reading Courses

Graduate students taking directed reading courses register under one of the following designations, depending on whether the course extends for the first term, the second term, or the full academic year:

- POLI 5602.03: Readings in Political Science
- POLI 5603.03: Readings in Political Science

## Thesis

Students register for the thesis under the appropriate designation, as follows:

- POLI 9000.00: MA Thesis
- POLI 9530.00: PhD Thesis

# Course Descriptions

### **POLI 5100 Research Methods and Design**

CREDIT HOURS: 3

This course provides an overview of some of the most common qualitative research methods and designs among political scientists. Its primary objectives are two-fold: First, it aims to equip graduate students to engage with the broad political science community about methodological debates. Second, it is designed to take students through the process of developing either an MA thesis proposal or a PhD dissertation proposal in a systematic way as well as to enable students to defend their research design and methodological choices vigorously. Upon completion of the course, students will have a polished draft of their proposal that can then be refined with their supervisors.

PREREQUISITES: Permission of instructor.

RESTRICTIONS: Must be an MA or PhD student in political science

FORMATS: Seminar

### **POLI 5207 Advanced Seminar in Canadian Politics**

CREDIT HOURS: 3

This senior seminar will take an in-depth and critical look at the major issues and institutions in Canadian politics and government. Topics include: the concentration of power; parliamentary governance: constitutional politics; party and electoral systems; and the role of the mass media and pressure groups.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4207.03

EXCLUSIONS: POLI 4204.06, POLI 4207.03

FORMATS: Seminar

### **POLI 5221 Canadian Parties in Comparative Perspective**

CREDIT HOURS: 3

This is an advanced undergraduate/graduate course that explores the organization, role, functions, and decline (?) of political parties in modern democracies. Although we will spend considerable time exploring the Canadian case, debates surrounding Canadian parties will be situated in a broader comparative context. In doing so we will consider the extent to which Canadian parties are 'unique'. Throughout the course we will consider whether and how the institutional features of the Canadian state (e.g., federalism) and the makeup of Canadian society (e.g., regionalism, multinationalism, etc.) effect the organization, character, and functions of our parties. The topics to be covered include party organization, party membership, personnel recruitment, and election campaigning. While in no way a prerequisite, students may find it beneficial to take POLI 3224 prior to this class as it provides an introduction to Canadian parties.



PREREQUISITES: Recommended (but not required): POLI 3224.03 or equivalent  
EXCLUSIONS: POLI 4221.03  
FORMATS: Seminar

### **POLI 5232 Urban Governance in Canada**

CREDIT HOURS: 3

The objective of this course is to provide students with the empirical, analytical, theoretical, and methodological tools to understand and explain the politics and policy activities of Canada's urban and suburban municipalities within their socio-economic, institutional, and constitutional contexts. A major concern is to evaluate how effectively and equitably city governments in Canada have responded to contemporary urban challenges. The course adopts a critical perspective on urban governance and engages with contemporary debates concerning municipal governance reform and the evolving nature of urban governance within Canadian federalism.

PREREQUISITES: Permission of the Instructor

CROSSLISTED: POLI 4232.03

FORMATS: Seminar

### **POLI 5234 Canadian Urban Politics in Comparative Perspective**

CREDIT HOURS: 3

This course examines the politics and governance of Canadian cities from a comparative perspective. More specifically, the course uses comparative method in three ways: it asks what one can learn from comparing Canadian cities with each other (subnational comparisons), what cross-national comparisons of Canadian cities can teach as well as compares Canadian cities implicitly with other cities by applying to Canadian cities theories of urban politics and development that have been developed elsewhere. The objective of this course is to provide advanced political science students with the theoretical, empirical and methodological tools to understand and explain the political development of Canadian cities.

PREREQUISITES: Permission of the Instructor

CROSSLISTED: POLI 4234.03

FORMATS: Seminar

### **POLI 5240 Introduction to Public Policy**

CREDIT HOURS: 3

A comprehensive examination of the three critical questions. This course provides a general introduction to the field of policy management, for graduate and honours undergraduate students. Using British 'best practice' ideas of professional policy making and Canadian statements of generic policy competencies, it seeks to improve the policy capacity of participants. It does this first by increasing their knowledge of public policy structures, processes, and outputs, and secondly, by giving them knowledge that they can use in policy advocacy both inside and outside government. The first section of the course examines policy definitions and professional policy making approaches in the 21st century. The second section considers the role of the state in the 21st century, and the policy competencies that analysts must have if that role is to be carried out effectively. Section three explores vertical, horizontal and external policy relationships, both as determinants of policy and as practical matters of management. Section four explores, and helps participants to gain proficiency in, the most recent processes of strategic policy design and implementation. This blend of theory and practice will increase the policy knowledge of all participants, and equip those who are in professional programs, including the various public services, to contribute more effectively in policy processes in the future. CROSS-LISTED: POLI 4240.03/PUAD 5120.03

PREREQUISITES: Permission of the instructor.

FORMATS: Seminar

### **POLI 5241 Introduction to Policy Analysis**

CREDIT HOURS: 3

This course examines four aspects of policy analysis: 1) the role of the analyst in modern government; 2) the analyst's working environment; 3) techniques used in carrying out research and preparing position papers; and 4) the analyst's responsibilities to government and to the public in determining what information should reach decision-makers. Approved with Canadian Studies.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: PUAD 5121.03

FORMATS: Seminar

### **POLI 5242 Political Behaviour: Reason, Passion, Biology**

CREDIT HOURS: 3

Political behavior is the study of the private roots of public action. To understand how and why people act politically, we delve into psychology, family life, sexuality, and genetics. In addition to these individual characteristics, the economy, geography, and class drive the political behaviour of individuals and organized groups. Topics include: public opinion, political polarization, culture wars, elections, modernization theory, populism, democratization, and the resource curse. The final unit considers big data and commercial applications of social science research in political practice. Although this material is

comparative, we principally want to investigate how it applies to Canada.

CROSSLISTED: POLI 4242.03

FORMATS: Seminar

### **POLI 5250 Canadian Public Administration**

CREDIT HOURS: 3

This course examines the organization and management of the executive-bureaucratic structures of government for the formation and management of public policy and public services. It considers the design and operation of the cabinet system and ministerial portfolios; relations between ministers and the career public service, policy and budgetary processes; and the structural designs of departments, agencies, crown corporations and regulatory commissions. A major focus will be the effects of the new public management on public administration, as governments in Canada, as elsewhere, seek to cope with budgetary restraints, increased demands for quality services and public participation, and greater effectiveness in securing results.

CROSSLISTED: POLI 4250.03

FORMATS: Lecture | Discussion

### **POLI 5260 The Politics of Health Care**

CREDIT HOURS: 3

Because of its nature as both a public institution and a political icon, the Canadian healthcare system is an inherently political institution which cannot be understood without a clear comprehension of both its composition and its relationship to the broader political landscape in Canada. This course will provide a survey of the political and theoretical debates within the area of healthcare in Canada, including investigations of federalism, funding, and governance.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4260.03

FORMATS: Seminar

### **POLI 5301 Comparative Theory**

CREDIT HOURS: 3

This course examines two levels of theory utilized in the study of politics in different nations: 1) the major paradigms or approaches to comparative political analysis, characterized by rationalist, structuralist and culturalist approaches to methodology and knowledge, and differentiated by “orthodox” and “radical” and post-modern worldviews; and 2) selected theoretical tools used to analyze themes like the political system, the nature of the state, institutions, group and class politics, social, corporatism and elitism, political culture and ideology, democratic and revolutionary regime change, political development and economic dependency, social movements and feminism, etc. The list of topics is subject to revision depending on the students' backgrounds and interests.

PREREQUISITES: Permission of the instructor.

FORMATS: Seminar

### **POLI 5302 Governance and Administration in Developing Countries: Issues and Controversies**

CREDIT HOURS: 3

Some analytical and normative issues of public administration in developing countries are examined including the scope of development administration as a sub-field of public administration; public sector organization and management including public services, public enterprises, decentralization and rural development, financial systems, human resources management, aspects of state economic management with African countries and Asian Tigers case studies; and institutional aspects of aid administration with CIDA and World Bank cases.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4302.03

FORMATS:

### **POLI 5303 Human Rights and Politics**

CREDIT HOURS: 3

This course will examine the evolving place of human rights in politics, both comparative and international. We begin by examining the historic emergence of human rights as an issue in world politics, principally since the Second World War and their conceptual foundations. We then focus on a number of specific topics and controversies concerning human rights in world politics, including: the sources of and struggle to end human rights abusive regimes; the multilateral politics of human rights; human rights in national foreign policies; the rights of indigenous peoples; genocide; humanitarian intervention, and the responsibility to protect; the relationship between globalization and human rights; and the 'Global War on Terrorism' and human rights. Finally, we look at the role of human rights in domestic politics, focusing on the issues of women's rights and sexual orientation.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4303.03

FORMATS:

**POLI 5322 The EU as a Global Actor**

CREDIT HOURS: 3

The aim is to enable the student to analyze and understand the international roles played by the EU in both economic and political areas. Why has the EU been better able to speak with one voice in economic areas than political areas? To what extent can the member states control the foreign policies of the EU? The introductory part will include an overview of the EU governance systems in the area of external economic relations (first pillar) and the Common Foreign and Security Policy (second pillar) and analyses of the main achievements in both areas. Specific topics to be selected for analyses during the second part will include the EU and the WTO, the EU and the US, the EU and East Asia, and the EU and developing countries. Finally, in the third part of the course students study recent efforts to develop a European Security and Defense Policy.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4322.03

FORMATS:

**POLI 5340 Approaches to Development**

CREDIT HOURS: 3

A survey of theories of and policies about dependence, underdevelopment, and peripheral social formations. Particular emphasis on modernization, materialist, and alternative modes of analysis, and on orthodox and radical strategies of development. Topics treated include social contradictions (e.g., class, race, and ethnicity), debt, structural adjustment, human development, human security, gender, technology, civil society, informal sectors, democratization, and ecology.

PREREQUISITES: Permission of the instructor.

FORMATS:

**POLI 5345 Politics of Southern Africa**

CREDIT HOURS: 3

This course focuses on political change in the Southern African region since the end of colonialism. It compares the experience of the various countries in the region to development and security pressures related to the legacies of colonialism, persistent economic problems and recent structural adjustments, environmental degradations and threats, ethnic, class and gender cleavages, strategic and social problems related to first apartheid and later post-apartheid transitions, issues of governance and regional conflict as well as more positive trends that towards abatements in civil wars and a surge of democratization. As well as country comparisons, the course will look at the region as a political unit, exploring the opportunities for and constraints against formal regional cooperation on economy or security as well as informal processes that constitute the basis of "new" regionalism forces.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4345.03

FORMATS:

**POLI 5355 Comparative Perspectives on the Development State**

CREDIT HOURS: 3

This course examines development in a broad regional comparative context to determine whether endogenous or exogenous conditions account for the success with which the North/Southeast Asian economies have been transformed vis-a-vis Latin America and Africa. The course compares the "developmental state" model across the developing world, by briefly focusing on three distinct cases - South Africa, Malaysia, and Brazil - as "upwardly mobile" late industrialisers.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 3355

FORMATS: Seminar

**POLI 5380 Politics of Climate Change**

CREDIT HOURS: 3

This course examines interactions between politics and a changing climate. Topics include: the role of science and economics in climate politics; the new 'climate capitalism' and non-capitalist alternatives; Canada's difficulties in addressing climate change; climate politics at the personal level; international climate negotiations; and climate as a security issue.

PREREQUISITES: POLI 3385.03 or POLI 3585.03 highly recommended, but not required or Permission of the Instructor

CROSSLISTED: POLI 4380.03

FORMATS: Seminar

**POLI 5403 Human Rights: Philosophical Issues**

CREDIT HOURS: 3

An examination of the historical and conceptual development of human rights, this course looks specifically at normative and political issues involved in the emergence of human rights from the 13th century to the present. It covers the shift from natural law to natural right, the emergence of states' rights to sovereign governance, and the development of specific classes of rights (including freedom of conscience, property rights, women's rights, cultural rights, animal rights, and socioeconomic rights).

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4403.03, PHIL 3470.03

FORMATS: Seminar

### **POLI 5440 The Politics of Affect: Theories of Emotion and Political Life**

CREDIT HOURS: 3

This course draws on recent developments in the burgeoning field of affect studies to address the relation of both conscious and non-conscious emotive experience to public and political life. Drawing on the insights and scholarship from different disciplines, we will examine the social, political, and cultural theories of affect, emotion, and aesthetics to explore their role in political decision-making and public responses. Topics will include the affective logic of public threat, the cultural politics of emotion such as fear and shame; sensorial responses to moralistic rhetoric; visceral responses to social groups and/or cultural practices. We will also look at how sensibility, feeling, and affect have operated in social and political movements, including a consideration of emotions such as fear, disgust, and distain, and compassion in social conflict, and in the formative approaches to retribution and reconciliation.

PREREQUISITES: Permission of the instructor

CROSSLISTED: POLI 4440.03

FORMATS: Seminar

### **POLI 5450 Political Theories of International Ethics and Global Justice**

CREDIT HOURS: 3

What duties do states, and their members, have beyond their borders? Are obligations of justice global in scope? Or, alternatively, are they constrained by national borders? What is the moral standing of states? This graduate-level seminar course will focus on contemporary debates in international political theory. In this course we will discuss liberal, republican, and discursive democratic perspectives on issues of global justice, particularly in light of global social structures and international inequalities. Major themes include: the historical roots of international relations theory; global distributive justice; republicanism and the ideal of non-domination; the possibility of global discursive democracy; cosmopolitanism; the moral relevance of borders; nationalism, patriotism, and special duties; sovereignty, international law and the international order. Major thinkers include: Immanuel Kant, John Rawls, Jürgen Habermas, Phillip Pettit, Charles Beitz, Thomas Pogge, Iris Marion Young and Seyla Benhabib, among others. Students should therefore have a background in political theory. The course will consist of seminar discussions, framed by short presentations by students that draw on their critical reflection papers.

PREREQUISITES: Permission of the Instructor is required. Background in political theory and/or political philosophy is highly recommended.

FORMATS: Seminar

### **POLI 5466 The Social and Political Construction of Health and Medicine**

CREDIT HOURS: 3

Despite the rise of "evidence-based medicine," the way in which health and illness are understood and addressed remains strongly influenced by social and political variables. This class examines the way in which the "scientific" evidence underlying medicine is constructed and applied; the manner in which certain categories of illness (depression, anxiety, schizophrenia, addiction, low libido, and obesity) are mediated by social and political dynamics; and the role of specific social and political agents in shaping how health and illness are conceived and addressed. In contradistinction to POLI 4260.03, which focuses on systems and institutions, this class looks at the way in which ideas and epistemology shape conceptions of health, the design of health policy, and the practice of medicine.

CALENDAR NOTES: Please note that this class is held with POLI 4466.03.

PREREQUISITES: By permission of the instructor.

EXCLUSIONS: POLI 4466.03

FORMATS: Seminar

### **POLI 5476 Liberalism and Global Justice**

CREDIT HOURS: 3

This is a course in normative political theory. We will critically examine some recent normative political theory, and then examine the prospects and perils of attempts by recent liberal theory to articulate a principled vision of global justice. We will consider Rawls' original bounded theory of justice and examine some challenges it faces from both cosmopolitan theories of justice and proponents of nationalism. Next, we will consider rival political conceptions of liberal international justice, and Rawls' response in the form of his recent *The Law of Peoples*. Concluding, we will examine specific issues of applied political justice (namely, human rights and immigration) as well as issues of economic and social justice and poverty.

CROSSLISTED: PHIL 5212.03, PHIL 3476.03, POLI 3476.03

FORMATS: Lecture | Discussion

### **POLI 5479 Classical Liberalism and Democracy**

CREDIT HOURS: 3

Liberalism takes a variety of forms and includes many topics including the rule of law, limited government, the free exchange of goods, entitlement to property, the self, and individual rights. Its philosophical and political assumptions provide the intellectual context within which its account of the individual, its vision of the community and its preferred allocation of resources will be assessed. Recent work in Democratic Theory will also be explored.

CROSSLISTED: PHIL 5470.03

EXCLUSIONS: PHIL 4470.03, POLI 4479.03

FORMATS: Seminar

### **POLI 5481 Theories of Violence, Persecution and Genocide**

CREDIT HOURS: 3

This course will provide an overview of contemporary theoretical approaches to systemic violence, particularly against racial, ethnic, and sexuality minorities. Through a selection of historical and contemporary case studies, it will assess different accounts and explanatory frameworks for understanding the instigation and exacerbation of persecution and genocide. Attending to the role of the state and state policies in the history of violence, it will examine the discourses and practices that have both fueled and justified the colonization of native peoples, enslavement of racial groups, the holocaust, and ethnic cleansing in 20th century genocides. We will also consider the recent attempts of the international community to prevent, deter, and curb genocidal outbreaks, and the theoretical assumptions about human behaviour that underpin them.

CROSSLISTED: POLI 4481.03

### **POLI 5512 The Politics of North America**

CREDIT HOURS: 3

North America has become increasingly integrated over the last thirty years--economically, demographically, and even politically. This course will review the history of regional integration in North America and consider a number of contemporary policy controversies. It bridges sub-disciplinary boundaries by looking at both domestic policymaking (Comparative Politics) and at bargaining between the three countries (International Relations).

PREREQUISITES: Permission of the instructor.

FORMATS: Seminar

### **POLI 5523 International Relations Theory 1: Order, Conflict and Change**

CREDIT HOURS: 3

Explores classic and contemporary debates in International Relations theory, with particular attention to the nature of international order, the bases for war and peace, and the question of transformational change.

PREREQUISITES: Permission of the Instructor

EXCLUSIONS: POLI 4523.03

FORMATS: Seminar

### **POLI 5524 International Relations Theory 2: Cooperation, Institutions and Development**

CREDIT HOURS: 3

Explores classic and contemporary debates in International Relations theory, with particular attention to the bases for international cooperation, the role of law and institutions, and the foundations of political economy.

PREREQUISITES: Permission of the Instructor

CROSSLISTED: POLI 4524.03

EXCLUSIONS: POLI 5520.06

FORMATS: Seminar

### **POLI 5532 Indigenous Global Politics**

CREDIT HOURS: 3

This course introduces students to topics of Indigenous governance, power, and self-determination in a global perspective. It examines how Indigenous peoples participate in contemporary global politics, challenging conventional approaches to the scholarship and practice of international relations. We explore the contradictions of the state as it relates to Indigenous peoples and alternatives to the current international system as expressed by Indigenous scholars, recognizing that these "alternatives" are not alternative to the peoples and cultures where these ways of knowing and being originate. We will ground our discussions in the context of colonialism past and present, highlighting Indigenous peoples' resistance to colonialism and state violence, as well as relationships between decolonization and self-determination.

EXCLUSIONS: POLI 4532.03

### **POLI 5550 Japanese Foreign Policy**

CREDIT HOURS: 3

This course focuses on the course of Japan's foreign policy since 1945, and the factors that have shaped its approaches to regional and international issues. Topics are studied in the contexts of Japanese history, cultural traditions, its economy, and domestic politics.

CROSSLISTED: POLI 3550.03

FORMATS: Seminar

### **POLI 5560 Issues in Global Security and Development**

CREDIT HOURS: 3

Security and development are indissolubly linked: development is compromised when security remains problematic, while a secure environment requires some form of sustainable development. Two of the principal manifestations of this 'security-development nexus' have been intrastate wars and collapsed states. In 2011 for example, none of the states emerging from civil war had reached any of the Millennium Development Goals set by the United Nations. Moreover, the security-development relationship conditions our capacity to develop effective policies on how and whether to intervene in 'fragile' or 'collapsed' states where the security environment is highly problematic, and our capacity to contribute to the economic and human development of these countries. This course aims, first, to give students a broad understanding of the various dimensions of the security-development nexus; and second, to address significant practical implications of this nexus. An important portion of the course will examine specific case studies, and feature keynote practitioners who are grappling with these concepts in everyday situations in the field.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 3560.03

FORMATS: Seminar

### **POLI 5561 Security-Development Nexus: Theory, Policy & Complex Operations**

CREDIT HOURS: 3

Security and development are indissolubly linked: development is compromised when security remains problematic, while a secure environment requires some form of sustainable development. Two of the principal manifestations of this 'security-development nexus' have been intrastate wars and collapsed states. In 2011 for example, none of the states emerging from civil war had reached any of the Millennium Development Goals set by the United Nations. Moreover, the security-development relationship conditions our capacity to develop effective policies on how and whether to intervene in 'fragile' or 'collapsed' states where the security environment is highly problematic, and our capacity to contribute to the economic and human development of these countries. This course aims, first, to give students a broad understanding of the various dimensions of the security-development nexus; and second, to address significant practical implications of this nexus. An important portion of the course will examine specific case studies and feature an interagency simulation to provide students with a sense of what it is like to grapple these concepts beyond the classroom.

CROSSLISTED: PUAD 6561.03

RESTRICTIONS: By permission of the instructor

EXCLUSIONS: POLI 4561.03, POLI 5560.03 and POLI 3560.03

FORMATS: Seminar

### **POLI 5565 Contemporary Security Studies**

CREDIT HOURS: 3

The course examines developments in the theory and practice of international security since the end of the Cold War. The first part reviews the concept of security and the main theoretical approaches that inform the contemporary security debate. The second part analyzes some of the key contemporary issues in world politics and their relation with international security.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 3565.03

FORMATS: Lecture | Seminar

### **POLI 5569 Canadian Foreign Policy**

CREDIT HOURS: 3

This advanced seminar course is concerned with the 'structure-agent' problem as it applies to Canadian foreign policy. In other words, what are the structures (both material and normative) that shape and constrain the pursuit of Canadian foreign policy; what room for maneuver and initiative is there; and who are the key actors, or 'agents' who shape and implement Canada's global role? The course discusses these questions through four sections: theoretical and analytical approaches to the study of Canadian foreign policy; the external context; the domestic context; and key themes and issues in Canadian foreign policy.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4569.03

EXCLUSIONS: POLI 5570.06

FORMATS: Seminar

### **POLI 5575 Nuclear Weapons and Arms Control in World Politics**

CREDIT HOURS: 3

The seminar examines the technological, doctrinal, and political aspects of the nuclear weapons “problem” and the arms control “solution”. It also assesses the fate of contemporary nuclear arms control efforts.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4575.03

### **POLI 5581 International Diplomacy: Institutions and Practices**

CREDIT HOURS: 3

This course looks at the way states decide which diplomatic strategies to pursue, and why these succeed or fail. Among the themes considered are the evolution of diplomacy as an international institution, national power and bargaining leverage, and the effects of domestic politics, psychology, and culture on international negotiation. Specific historical cases which may be reviewed in any given year include: the Peloponnesian War, the Munich Crisis, the Cuban Missile Crisis, the negotiation of the Canada-US Free Trade Agreement and NAFTA, and the Kyoto Protocol. Students participate in a negotiation-simulation exercise and write a paper on a particular case.

PREREQUISITES: Permission of the instructor.

EXCLUSIONS: POLI 4581.03

FORMATS:

### **POLI 5587 International Political Economy**

CREDIT HOURS: 3

This course is composed of two overlapping constituent themes. The first theme is that of competing explanations of international political economic behaviour - behaviour affected by that diffuse political authority characteristic of the international system, the second, that of examining the basic issues in international political economy - the fundamental questions as to why international trade, international finance, unequal economic development, international organization, and the multinational enterprise. The first theme functions to create the over-all framework of analysis by which competing approaches to international political economy can be evaluated. The second theme will integrate these approaches with issue areas within the fields of international trade, international finance, and what might be termed "international production" (within which fields issues such as economic development, the multinational enterprise, and the global "division of labour" constitute the major foci). The course sessions will roughly be constituted by 50 percent lecture and 50 percent organized student contributions for seminar discussion and debate.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4587.03

FORMATS:

### **POLI 5589 Politics of the Sea II**

CREDIT HOURS: 3

The course will examine environmental, political, and economic forces which affect contemporary ocean governance and management. Contemporary issues will be used to explore the geo-political ocean on a sectoral basis (transportation, fisheries and resources, military, etc.), as well as analyzing the evolution of national and international oceans policies and institutions.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: MARA 5589.03, POLI 4590.03

FORMATS:

### **POLI 5595 Politics of the Sea II**

CREDIT HOURS: 3

This course examines Ocean Governance in the context of global developments from UNCLOS/UNCED to Integrated Ocean and Coastal Management with a particular focus on issues of Oceans and Zones of Peace, the Economics of the Common Heritage and Institutional Requirements necessary to govern oceans equitably and in a sustainable manner. The course will be delivered in a seminar format and students will be required to deliver presentations, participate in simulation exercises, and submit a term paper.

PREREQUISITES: Permission of the instructor.

CROSSLISTED: POLI 4590

FORMATS: Lecture | Seminar

### **POLI 5602 Readings in Political Science**

CREDIT HOURS: 3

CALENDAR NOTES: Students wishing to enroll in a reading course must first consult with the Graduate Coordinator of Political Science.

FORMATS: Other (explain in comments)

### **POLI 5603 Readings in Political Science**

CREDIT HOURS: 3

CALENDAR NOTES: Students wishing to enroll in a reading course must first consult with the Graduate Coordinator of Political Science.

### **POLI 9000 MA Thesis**

CREDIT HOURS: 0

### **POLI 9530 PhD Thesis**

CREDIT HOURS: 0

## **Process Engineering and Applied Science**

### **Location:**

Chemical Engineering Building  
5273 DaCosta Row, Sexton Campus  
PO Box 15000  
Halifax, NS  
B3H 4R2

Telephone: (902) 494-4597

Website: <https://www.dal.ca/faculty/engineering/peas/programs/graduate.html>

Email: [peasgrad@dal.ca](mailto:peasgrad@dal.ca)

### **Programs**

- Biological Engineering
- Chemical Engineering
- Food Science

### **Biological Engineering**

Biological Engineering applies natural science and engineering principles to the biological world. As such, Biological Engineering addresses a wide range of problems relating to the production and processing of environmental, food and other biomaterials, renewable energy, and reusable resources. Emphasis is placed on optimizing design performance in dealing with biological materials and systems while preserving sustainability and protection of the environment. The Biological Engineering program has focused research on environmental engineering and biosystems engineering. Research projects therefore encompass both specific environmental concerns and the sustainable utilization of natural resources. The program has co-operative projects with faculty members in other universities both locally and internationally. Opportunities exist to participate in these research projects, providing wider experience and in which a specific component leads to a Master's or Doctorate degree.

### **Chemical Engineering**



The Chemical Engineering program prepares students for careers in the chemical and process industries in a variety of related fields. These encompass, among others, the traditional areas of environmental control, plastics and polymers, pulp and paper, instrumentation and process control, petrochemicals, petroleum and natural gas processing, and energy conversion and utilization, as well as the growing fields of biotechnology, food processing, composite materials, corrosion and protective coatings, and manufacture of microelectronic components. The responsibilities assumed by Chemical Engineers include a wide range of activities such as research and development of novel products and processes, the design, development and operation of process plants, and management of technical operations and sales. Research opportunities leading to the Master's and Doctorate degrees are offered in a wide range of topics within the Department, as well as in conjunction with other departments and a number of research centres on the campus.

## Food Science

Food science applies basic scientific principles to food-related problems and is concerned with the functionality of food ingredients, the preservation of quality, and the delivery of nutrients throughout the food supply. Food scientists are therefore involved in food processing, product development, research and quality assurance programs, including the regulatory aspects of food ingredients and additives. Graduate degrees are awarded in Food Science at the Master's and Doctoral levels with graduate level course work and research opportunities related to food process technology, edible oils, engineering design, food rheology, and beverage science. These graduate programs share some facilities with CIFT, a specialized resource centre for graduate education and research in food science and food process engineering with emphases in brewing and nutraceutical research.

## Staff

### Department Head

**Kuzak, S.**, BEng, MEng (McGill), PhD (Dalhousie), PEng

### Graduate Coordinator

**Budge, S.**, BSc (Acadia), PhD (Memorial). Marine lipids, trophic studies, fish nutrition, lipid oxidation

### Graduate Secretary

**Colicchio, P.**

### Professors Emeriti

**Caley, W. F.**, BSc (Eng), MSc (Eng) (Queen's), PhD (Toronto), PEng. Ceramic and metal matrix composites, pyrometallurgy, slag/refractory reactions in steelmaking, nickel, and aluminum powder metallurgy

**Gill, T. A.**, BSc, MSc (Guelph), PhD (UBC). Food proteins and enzymes, seafood quality, safety, preservation, antimicrobial peptides and marine toxins

**Paulson, A. T.**, BSc (Agr), MSc, PhD (UBC). Food chemistry, physio-chemical properties, polymers, emulsions and gels, dielectric methods, fermentation technology

### Professors

**Amyotte, P. R.**, BEng (RMC), MSc (Eng) (Queen's), PhD (TUNS), PEng. Industrial safety and loss management, dust explosions

**Brooks, M. S.**, BTech (Hons) (Massey), PhD (Cambridge), PEng. Bioprocess engineering, biochemical engineering, biotechnology, drug delivery, pharmaceutical processing, food engineering, waste utilization

**Budge, S.**, BSc (Acadia), PhD (Memorial). Marine lipids, trophic studies, lipid oxidation

**Pegg, M. J.**, BSc, PhD (Leeds), PEng. Combustion, safety, and loss prevention

**Speers, R. A.**, BSc (Agr), MSc, PhD (UBC).

### Associate Professors

**Donaldson, A.**, BASc, PhD (Ottawa), PEng. Multifluid process design, multiphase flow, computational fluid dynamics, oscillating reactor technology

**Ghanem, A.**, BSc (UNB), PhD (Cornell), PEng. Tissue engineering, drug delivery, bioprocessing, toxicology

**Haelssig, J.**, BASc, PhD (Ottawa), PEng. Multiphase CFD, process intensification, multicomponent phase change, hybrid separation processes, biofuels

**Kermanshahi-pour, A.**, BSc (Mashhad), MSc (Western), PhD (McGill), PDF (Yale), PEng. Microalgae integrated biorefinery, carbon dioxide sequestration, Bioenergy, Biofuel, Biodegradation pathway of contaminants, Bioremediation of contaminants

**Kuzak, S.**, BEng, MEng (McGill), PhD (Dalhousie), PEng

**Mazzanti, G.**, BEng (America), MASC, PhD (Guelph). Food processing, food engineering, crystallization of lipids under shear flow, synchrotron x-ray diffraction, NMR, thermal and dehydration

### **Assistant Professors**

**Koleilat, G.**, BAsC (Concordia), MASC, PhD (Toronto). Nanomaterials for energy conversion and sensing

**Scott, A.**, BAsC, MASC, PhD (Waterloo). Polymerization kinetics, structure/property relationships, design of polymeric materials, multi-component polymers (copolymers, terpolymers, etc.), enhanced oil recovery

**Sokolenko, S.**, BAsC, PhD (Waterloo). Cell culture, process monitoring, metabolomics, nuclear magnetic resonance

### **Instructors**

**Hastie, M.**, BSc (Ottawa), MASC (Ottawa), PEng.

**Hadavand, M.**, BSc (Yazd), MSc (Shiraz), PhD (UNB), PEng.

### **Cross Appointments**

**Freund, M.**, BSc (Florida Atlantic University), PhD (Florida). Electrochemistry, conjugated polymers, solar fuels, artificial photosynthesis, organic electronics, machine olfaction, surface science

### **Adjuncts**

**Al Taweel, A. M.**, BSc (Alexandria), MSc, PhD (Colorado), PEng. Mixing and separation, multi-phase CFD pollution prevention

**Armenta, R.**, BEng (Sonora Institute of Technology), MSc, PhD (Autonomous Metropolitan Univ). Microbial oils and high-value products through fermentation with algae, including work on fermentation optimization, downstream processing, and genetics

**Blouin, S.**, BAsC (Laval), MASC (Ecole Polytechniques), PhD (Queen's)

**Khan, F.**, BSc (Aligarh Muslim Univ), MSc (Univ of Roorkee), PhD (Pondicherry Univ)

**Miadonye, A.**, BSc (Univ of Southbank), PhD (Loughborough Univ)

**Sullivan-Ritter, J.**, BSc, PhD (Dalhousie)

## **General Information**

## **General Information**

### **Admissions Criteria**

All candidates must meet the admissions requirements of the Faculty of Graduate Studies and any specific admissions requirements as listed under each program.

### **Application Forms**

Application forms may be obtained from the Registrar's Office, Dalhousie University, PO Box 15000, Halifax, NS B3H 4R2, or through the university's website. Prospective students are encouraged to contact the Graduate Admissions Officer for program specific information.

### **Course Requirement**

At least three-quarters (75%) of the total course requirement for each graduate program must be taken at Dalhousie University.

### **English Language Proficiency Requirement**

Information pertaining to the English language proficiency requirements is given in the Faculty of Graduate Studies Regulations Section 3.4.

### **Fees**

Information pertaining to fees and expenses can be found online in the admission section of the Dalhousie Website.

### **Financial Assistance**

Information pertaining to financial assistance and scholarships can be found online in the Funding Opportunities section of the Dalhousie Faculty of Graduate Studies Website.

### **Health Insurance Requirement**

Information pertaining to health insurance requirements is given in the Resources and Services section of the Dalhousie Graduate

### **Graduate Student Program**

The graduate student's program, including supervisory committee composition, will be entered in the Graduate Student Information System (GSIS) by the department and approved by the supervisor, the graduate coordinator and FGS. The details of the program should be submitted in the first month after initial registration. The composition of the supervisory committee should be entered by the end of the second term.

### **Leave of Absence**

Students may formally apply for a leave of absence in accordance with Faculty of Graduate Studies Regulations, Section 5.8.

## **Master's Degrees**

A student's program of study for the Master's degree may be either a research-intensive program (Master of Applied Science (MASc) or Master of Science (MSc)) or a coursework intensive program (Master of Engineering (MEng)). Note that a thesis-based research Master's degree is normally required to gain admission into the PhD program.

## **Master of Applied Science and Master of Science**

### **Admissions Requirements**

A candidate to be considered for the MASc or MSc research program must have obtained, with a high scholastic standing, an undergraduate degree in engineering or in science with honours, or their equivalents, from a recognized university. Candidates must also be recommended for admission by a faculty member in the program in order for their application to proceed. Please note a recommendation for admission is not a formal acceptance.

Candidates for the above degrees may be required to take additional undergraduate subjects as a preparation for advanced courses or to give the candidate a suitable background in engineering or science. Such subjects are seldom considered part of the graduate program.

### **Academic Regulations**

#### **Program Requirements**

MASc and MSc graduate programs consist of at least 12 credit hours of course work, the graduate seminar, and a thesis. Not more than one senior level undergraduate course may be taken as part of the 12-credit hour requirement.

#### **Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as delivering at least one seminar presentation.

#### **Supervisor and Supervisory Committee**

The Department is to ensure that supervisors are assigned to students as a prerequisite to admission. If the supervisor is not a full-time member of the Department, a co-supervisor will be appointed from the Department. The Supervisory Committee will consist of the thesis/project supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with expertise in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

#### **Examination Requirements**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

All Master's degree candidates must pass all graduate level courses, and any approved undergraduate course, with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering and are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis. All Master's degree candidates must pass an oral examination of their thesis or project after it has been submitted in satisfactory form. In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being

asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### **Time Requirement**

The minimum time requirement for completing a MASc or MSc program is twelve months. All students are required to register each term to maintain eligibility to continue a program of studies. Students are required to be on campus for at least two terms in the first year of his/her program. See Faculty of Graduate Studies Regulations, Section 7, for policies regarding the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for MASc and MSc Theses**

The thesis is to be prepared to conform with the standards of the Faculty of Engineering. To initiate the thesis defence, the form "Appointment for an Oral Examination & Thesis Submission Form – Master's Programs" must be submitted to the department at least 10 business days prior to the date of the oral defence. The department will coordinate the scheduling of the presentation and examination and assign a moderator. The oral presentation and examination will not be scheduled until the following requirements for the student's program of studies have been met:

- i) Course work completed;
- ii) Seminar completed;
- iii) Supervisory committee approved.

## **Master of Engineering**

### **Admission Requirements**

A candidate to be considered for the Master of Engineering course work program must have obtained an undergraduate degree in engineering or a related discipline with high scholastic standing from a recognized university. Applicants with industrial experience are encouraged to apply.

### **Academic Regulations**

#### **Program Requirements**

The MEng graduate program consist of 27 credit hours of course work and the graduate seminar. Six credit hours of the required 27 hours may be completed in the form of an optional project, requiring appointment of a project supervisor and presentation of the project results within the graduate seminar. Students should seek advice from the program coordinator if they intend to pursue this option. Undergraduate courses, in the area of a student's interest, not taken by the student for previous credit, may be included in the program, subject to prior approval. Not more than 12 credit hours may be at the undergraduate level.

Individual departments will assess applicants and select students for the program in their respective departments. Students' programs will be determined by the department in which the student is registered. All programs must have the approval of the department.

#### **Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period. MEng degree candidates choosing to complete the optional 6-credit hour project must also present their work within the graduate seminar.

#### **Supervisor and Supervisory Committee**

The Graduate Coordinator will serve as the Supervisor unless the student chooses to complete the optional project. The project supervisor will then serve as formal Supervisor and the Supervisory Committee will consist of the Supervisor and at least one other member with expertise in the proposed area of study.

#### **Examination Requirement**

All courses required to meet the degree requirements are considered essential courses. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

MEng degree candidates choosing to complete the optional 6 credit hour project as part of their 27-credit hour program requirement must present their work within the graduate seminar.

All MEng degree candidates must pass all graduate level courses, and any approved undergraduate courses, with a grade of at least B-. Graduate students are allowed to repeat only one course during their program in the Faculty of Engineering and are not eligible to write supplementary examinations. Transfer credits from other universities will be considered on a case-by-case basis. In addition to meeting the grade requirements, failure to maintain an acceptable academic standing will result in a student being asked to withdraw from the program. Failure to achieve the minimum mark as noted above shall be considered grounds for dismissal.

### **Time Requirement**

The minimum time requirement for completing a MEng program is twelve months. All students are required to register each term to maintain eligibility to continue a program of studies. Students are required to be on campus for at least two terms in the first year of his/her program. See Faculty of Graduate Studies Regulations, Section 7, for policies regarding the maximum length of time for degree completion and extensions.

## **Co-op Master's Degrees**

The Department of Process Engineering and Applied Science offers MAsC (Co-op), MSc (Co-op) and MEng (Co-op) degrees. Participation in the co-op program requires a co-op research project suitable for a master's thesis (for co-op MAsC and MSc degrees) or a master's project (for co-op MEng degree), and the student's acceptance by a faculty member in the Faculty of Engineering, as well as a suitable sponsoring organization. The faculty member who will supervise the graduate student will determine the suitability of a project for master's level research.

The academic requirements for co-op master's degrees in Engineering are identical to those for regular (e.g., non-co-op) degrees with the addition of a minimum of eight months, or up to 12 months, of co-op work term(s). During the work terms, the graduate student will work on a research project that will form the basis of his/her master's thesis/project. The graduate student will conduct all or part of their research as part of his/her co-op work at the employer's site. Also, all co-op graduate students should complete the "Co-op Orientation" course offered by the Science, Information Technology, Engineering Co-operative Education Office before going on a work term.

Academic/Work term schedules shall be designed by the Supervising Committee of the graduate student taking into consideration the requirements of the research project as well as the needs of the student and the employer. In developing the schedules, the Supervising Committees shall adhere to the following guidelines:

1. The last term before completion of the degree requirements shall be an academic term.
2. The first co-op work term in the MAsC and MSc programs will normally be taken after completing at least nine credit hours.
3. The first co-op work term in the MEng program will normally be taken after completing at least 12 credit hours.
4. Provided that conditions 1-3 above are satisfied, co-op work terms may be arranged in any combination that suits the student's research plan.

The normal upper time limits for the completion of co-op master's degrees will be the same as those for non-co-op degrees, e.g., four years for full-time and five years for part-time studies. The Supervisory Committee of co-op master's students will normally include the student's industrial supervisor as a member, or if appropriate (based on Faculty of Graduate Studies and Faculty of Engineering regulations), as a thesis/project co-supervisor. This arrangement will be agreed upon by the academic supervisor and the company before the student begins the program.

## **Doctor of Philosophy**

### **Admission Requirements**

A candidate to be considered for entrance into the PhD program must meet the admission requirements of the Faculty of Graduate Studies and must have:

- A research Master's Degree in engineering or science from Dalhousie University or any other recognized university, or an equivalent degree from a recognized university, acceptable to the Faculty of Engineering; or
- Acceptance for registration as a candidate for a research Master's degree at Dalhousie University.

An application for admission to the graduate program leading to the degree of Doctor of Philosophy should have a superior academic record and previous training or experience which indicates that the candidate should be capable of carrying out independent research. Candidates must also be recommended for admission by a faculty member in the Program in order for their application to proceed. Please note a recommendation for admission is not a formal acceptance.

Doctoral candidates are not admitted without appropriate funding to support the student and the program of research.

### **Admission from Master's Degree**

A candidate registered in a MASc or MSc Degree in the department may be transferred to a PhD Degree on the recommendation of their supervisory committee, according to the Regulations of the Faculty of Engineering. The recommendation will be reviewed by the Faculty of Engineering Graduate Studies Committee (GSC) and transmitted to the Faculty of Graduate Studies.

### **Academic Regulations**

All doctoral programs are developed under the regulations and procedures of the Faculty of Graduate Studies (see Faculty of Graduate Studies Regulations) and each program must be approved by the Faculty of Engineering and the Faculty of Graduate Studies.

### **Program Requirements**

A PhD graduate program consists of a minimum of 12 credit hours of course work, the graduate seminar, the comprehensive exam and the thesis. No undergraduate courses are allowed for credit in a Doctoral Degree program. Granting of credits to a student's program of studies for courses taken prior to commencement of the PhD program requires the recommendation of the Department and approval of the Faculty of Engineering Graduate Studies Committee. A request for this transfer of credits must be made to the Department within the first term following admission to the program.

### **Graduate Seminar**

The seminar requirement involves attending, and participating in, all Graduate Seminars held in the department throughout the duration of the student's residency period, as well as delivering at least two seminar presentations.

### **Supervisor and Supervisory Committee**

The Department is to ensure that supervisors are assigned to students as a prerequisite to admission. If the supervisor is not a full-time member of the Department, a co-supervisor will be appointed from the Department. The Supervisory Committee will consist of the thesis supervisor (and co-supervisor), at least one other member of the department, and at least one other member from outside the department with expertise in the proposed area of study. The supervisor will be the chair of the Supervisory Committee.

### **Thesis Subject Matter and Supervision**

The thesis shall consist of an original investigation or design carried out under the immediate supervision of a member of the Faculty of Engineering who is also a member of the Faculty of Graduate Studies.

### **Thesis Requirement**

A candidate will be required, as a major part of the program, to submit a satisfactory thesis embodying the results of original scholarship and independent research. See Faculty of Graduate Studies Regulations for information pertaining to doctoral theses.

### **Examination Requirements**

All courses required to meet the degree requirements are considered essential courses and will be so designated by the Supervisory Committee. Essential courses can include any required undergraduate or prerequisite courses. Any courses taken in excess of the requirements are subject to approval by the supervisor. These courses will appear on the student's transcript as regular courses.

A PhD degree candidate must pass all graduate level courses with a grade of at least B- and cannot carry a course failure. Graduate students are not eligible to write supplementary examinations. Failure to achieve the minimum mark shall be considered grounds for dismissal. Transfer credits from other universities will be considered on a case-by-case basis. In addition, PhD candidates are required to pass a comprehensive examination which normally takes place within the fourth study term. Finally, all PhD degree candidates must pass an oral examination of their thesis project after it has been submitted in satisfactory form, and in accordance with the Faculty of Graduate Studies Regulations.

### **Comprehensive Examination**

The Supervisory Committee is responsible for conducting the comprehensive examination. The purposes of the comprehensive examination are to assess the candidate's understanding of the chosen field of study as a whole and to evaluate their suitability to begin Ph.D. level research. The comprehensive examination consists of at least two written examinations and an oral examination conducted to meet the above objectives. The comprehensive examination shall normally be initiated within the fourth term of study. A student shall be given at least three months' notice of the examination. The topics and results of the examination will be conveyed to the Departmental Graduate Coordinator on the prescribed form and will indicate "pass", "fail", or "re-examination". The results are to be added to the student's transcript.

Recommendation of the examining committee to re-examine shall only be permitted if the failure was marginal. Re-examination of marginal students must be carried out within six months of the initial examination. Students requiring re-examination shall not necessarily be required to rewrite both written examinations. Students given the opportunity to rewrite shall only be permitted to rewrite once.

Students receiving a recommendation of “fail” will be academically dismissed from the program (see FGS regulations about dismissal).

### **Time and Residence Requirements**

A student is required to register each term to maintain eligibility to continue in a program of studies. See Faculty of Graduate Studies Regulations for policies regarding residency requirements and the maximum length of time for degree completion and extensions.

### **Procedures and Guidelines for PhD These Defences**

An Examining Committee is appointed in accordance with Faculty of Graduate Studies procedures prior to the formal submission of the thesis. The Examining Committee consists of the Supervisory Committee and an external examiner recommended to FGS by the Supervisory Committee. The External Examiner will be approached and appointed by the Faculty of Graduate Studies according to Faculty procedures.

A copy of the thesis must be submitted to the Faculty of Graduate Studies at least six weeks prior to the date of the oral defence. The copy will be sent to the External Examiner. The copy must be accompanied by the appropriate form. The oral presentation and examination will not be scheduled until the following requirements for the student’s program of studies have been met:

- i) Course work completed;
- ii) The graduate seminar requirement completed;
- iii) Comprehensive examination passed;
- iv) Examining Committee established;
- v) A written report has been received by the Faculty of Graduate Studies from the external examiner.

## **Biological Engineering Program**

### **Courses**

Not all courses are offered every year. Please consult the current timetable for this year’s offerings.

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year’s offering. For further information please contact the department.

## **Course Descriptions BIOE**

### **BIOE 6000 Small Watershed Hydrology**

CREDIT HOURS: 3

Following an overview of the nature of hydrologic data and models, emphasis is placed on deterministic mathematical modelling of component processes and the synthesis of complete hydrographs. Components examined include precipitation, infiltration, evapotranspiration, surface, and subsurface flow. The structure and application of selected current models are presented.

PREREQUISITES: A first course in engineering hydrology and microcomputer experience

### **BIOE 6010 Non-Point Source Pollution Control**

CREDIT HOURS: 3

Course content initially deals with variants of the empirical USLE approach to soil erosion estimation and control on land surfaces through application of the RUSLE model. Theoretical and quasi-process concepts quantifying soil detachment, transport, and deposition in interrill and rill runoff under rainfall and snowmelt leads to consideration of the dependent modelling of the form and movement of land applied nutrients and pesticides. Models used include

COSSEM, ANSWERSPS, CREAMS and SWAT. Emphasis is placed on model application to assess measures to protect surface water, groundwater, and aquatic life resources.

PREREQUISITES: At least one credit in engineering hydrology and microcomputer experience.

### **BIOE 6200 Advances in Waste Handling and Disposal**

CREDIT HOURS: 3

Current methods of handling and disposal of wastes are discussed. Physical, chemical, and biological properties of various types of waste materials as related to practical design problems are studied. Technological advances in holding tanks, lagoon design, pumping and agitation equipment, solid-liquid separation systems and land disposal equipment are introduced.

### **BIOE 6210 Advanced Biochemical Engineering**

CREDIT HOURS: 3

This course deals with advances in microbial fermentation and enzymatic reactions in biological reactors. Topics covered include: microbial and enzyme kinetics, system parameters, reactor design and scale-up, media and air sterilization, measurements and control, and recovery of fermentation products.

### **BIOE 6230 Biological Treatments of Wastes**

CREDIT HOURS: 3

The physical, chemical, and biological properties of various wastes as related to the design of biological treatment processes are discussed. Fundamental microbiology and factors affecting the growth and survival of microorganisms in biological systems are studied. Engineering fundamentals of various biological processes are presented. Treatment systems such as aerobic and anaerobic lagoons, oxidation ponds, oxidizing ditches and composting are introduced.

### **BIOE 6240 Biomass Energy**

CREDIT HOURS: 3

The source and amount of energy consumed in various agricultural operations will be studied. Renewable energy sources will be identified, and their technical feasibility will be investigated. Technological advances in biochemical and thermochemical conversion systems will be included and the impact of these conversion systems on the environment will be studied.

### **BIOE 6300 Instrumentation for Agricultural Engineering Research**

CREDIT HOURS: 3

The objective of this course is to integrate basic instrumentation and control components with a microcomputer. Primary elements which sense parameters of interest to Agricultural Engineers (e.g., humidity, temperature, pressure, flow, displacement, velocity and acceleration) are discussed with emphasis on the interfacing to a microcomputer. Topics covered in lectures and weekly laboratories include signal conditioning, digital to analog conversion, analog to digital conversion, voltage to frequency conversion, on-off control, and PID control. Students study the fundamentals through the breadboarding of a basic data acquisition and control system and by applying it to practical problems.

### **BIOE 6350 Advanced Instrumentation**

CREDIT HOURS: 3

This course covers topics in microprocessor-based measurement, computation, communications and control. Subject matter is covered in relation to the use of embedded microcontrollers. Development systems for both hardware and software emulation are utilized in weekly laboratory exercises and a term project. Topics covered include: assembly language programming, C programming using a "small C" environment, high speed data acquisition and data storage, computer to computer communications and interfacing of various sensor types and control hardware.

### **BIOE 6610 Applied Solar Energy**

CREDIT HOURS: 3

The course covers the following topics: solar radiation measurement and methods of estimating the availability of solar energy for flat-plate solar collectors; flat-plate solar collectors design and methods of testing their performance; energy storage; procedures for solar heating systems design including computer simulations; and design of monitoring systems for the evaluation of the performance of solar heating systems and their components. Topics in any given year will depend on the interests of students.



### **BIOE 6700 Directed Studies I**

CREDIT HOURS: 3

This course is available to graduate students enrolled in a MAsc or MEng degree program in Biological Engineering wishing to gain knowledge in a specific area or areas related to, but distinct from their research topic, and in which no graduate level course is offered. The student will be involved in tutorials, laboratory, and individual studies. The study will be presented in a report which uses thesis style format. Only one directed studies course can be used for credit for each degree.

### **BIOE 7700 Directed Studies II**

CREDIT HOURS: 3

This course is available to graduate students enrolled in a PhD program in Biological Engineering wishing to gain knowledge in a specific area or areas related to, but distinct from their research topic, and in which no graduate level course is offered. The student will be involved in tutorials, laboratory, and individual studies. The study will be presented in a report which uses thesis style format. Only one directed studies course can be used for credit for each degree.

### **BIOE 8900 MEng Project**

CREDIT HOURS: 6

A Master of Engineering candidate will be required to submit a project satisfactory to the Faculties of Graduate Studies and Engineering and to make a successful oral presentation of the work.

PREREQUISITES: Permission of instructor

FORMATS: Other (explain in comments)

### **BIOE 9000 MAsc Thesis**

CREDIT HOURS: 0

### **BIOE 9530 PhD Thesis**

CREDIT HOURS: 0

## **Chemical Engineering Program**

### **Courses**

Not all courses are offered every year. Please consult the current timetable for this year's offerings.

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## **Course Descriptions CHEE**

### **CHEE 6000 Special Topics in Chemical Engineering I**

CREDIT HOURS: 3

This course is available to graduate students (pursuing a MASc degree) wishing to gain knowledge in a specific area for which no graduate level courses are offered. The proposed course would involve a directed study for which the student(s) would be given credit. Students wishing to take the course would be assigned a suitable course advisor most familiar with the specific area of interest. Students would be required to present the work of one term (not less than 90 hours in the form of directed research, tutorials, and individual study), in an organized publication format.

PREREQUISITES: Instructor's permission

### **CHEE 6701 Loss Prevention and Risk Assessment**

CREDIT HOURS: 3

Loss prevention and risk assessment techniques applicable to the process industries are covered in this course. The concepts of management control of loss and inherently safer plant design are introduced. Key elements of a successful fire and explosion loss control program are identified. Risk assessment is addressed by examining the steps required to proceed from the setting of risk assessment objectives to risk monitoring. The hazard identification step is emphasized.

PREREQUISITES: Graduate students in Faculty of Engineering

EXCLUSIONS: CHEE 4773.03

### **CHEE 6707 Applied Thermodynamics**

CREDIT HOURS: 3

An analytical study of Chemical Engineering processes from the standpoint of quantitative chemical thermodynamics will be made. The approach to the main problem of reactions and phase equilibria and the treatment of non-ideal solutions is based on Gibb's methods and the chemical potential. Most of the student's time spent on this course will be used solving both theoretical and numerical problems.

### **CHEE 6714 Polymer Science**

CREDIT HOURS: 3

This course examines the fundamental concepts of polymer science: mechanism and kinetics of polymerization reactions, rheological and mechanical properties of polymers, correlation of physical properties with molecular structure, molecular weight distribution, solution properties of polymers, polymer chain configuration, thermodynamics of polymer solutions, amorphous and crystalline state, and viscoelasticity.

### **CHEE 6726 Mass Transfer Topics**

CREDIT HOURS: 3

Topics are to be selected from the following fields: diffusion in both reacting and non-reacting systems, the equation of change, mass transfer with laminar or turbulent flow, unsteady-state diffusion, and mass transfer in packed beds.

### **CHEE 6730 Kinetics and Catalyses**

CREDIT HOURS: 3

A general study of the current ideas of homogeneous and heterogeneous catalyses of chemical reactions will be made. In the field of homogeneous catalyses reactions: acid base catalyses, ion catalyses, enzyme catalyses, chain reactions and polymerization will be considered. In the field of heterogeneous catalyses, a study of the rates and extent of chemisorption will be made leading to an examination of the rate determining steps for gaseous reactions. Studies of some important industrial reactions will be made.

### **CHEE 6732 Transport Phenomena**

CREDIT HOURS: 3

Mechanisms of transport processes, differential balances, equations of change for isothermal and non-isothermal systems, use of the equations of change to set up flow problems of interest to Chemical Engineers, interphase transport in isothermal systems, analogies.

### **CHEE 6734 Chemical Reactor Design**

CREDIT HOURS: 3

The effect of non-ideal flow on the design of tubular, packed bed and continuous-stirred tank reactors, combined mass and energy transfer in chemical reactor analysis and design. Design of heterogeneous catalytic and non-catalytic reactors will be investigated using industrial case studies.

### **CHEE 6736 Computer Application in Chemical Engineering**

CREDIT HOURS: 3

Mathematical modeling of steady and unsteady chemical process operations and the use of digital computers for the design and simulation of individual processing units. Synthesis of units into a combined processing plant. (It is recommended that students take ENGM 6653.03 – Numerical Analysis I prior to this class).

### **CHEE 6737 Chemical Process Control**

CREDIT HOURS: 3

Dynamics modeling of chemical processes. Analysis and simulation of analog and digital control systems.

### **CHEE 6742 Chemical Process Optimization**

CREDIT HOURS: 3

The course deals with the study and application of optimization techniques to chemical engineering problems. Topics include: problem formulation, analytical and numerical techniques for optimization, linear programming, non-linear programming and dynamic programming. Application areas include: heat transfer and energy conservation, separation processes, fluid flow systems, chemical reactors, and process plants.

FORMATS: Lecture | Lab

### **CHEE 6743 Process Synthesis**

CREDIT HOURS: 3

This course aims at developing abilities in the design and modification process plants (e.g. chemical, biochemical, utilities, pulp and paper, petroleum, petrochemical, metals, and food processing) in order to render them more cost effective, energy-efficient and environmentally friendly. Systematic procedures are used for the analysis of processing stages and their integration into efficient plants. Heavy emphasis is placed on the use of computer-aided techniques for evaluating the interaction between processing requirements, utility needs and associated capital and operating costs.

FORMATS: Lecture | Lab

### **CHEE 6744 Radiative Heat Transfer**

CREDIT HOURS: 3

The principles of thermal radiation are explained, and the concepts of view factors and exchange areas are introduced by examining direct radiative transfer. Radiative exchange within enclosures, containing either non-absorbing or absorbing media are examined. Various radiative heat transfer applications are discussed in detail. These include: electric furnaces, fuel-fired furnaces and solar radiation. The methods of measurements of radiation and temperature are studied.

PREREQUISITES: Background in heat transfer and mathematics

FORMATS: Lecture | Lab

### **CHEE 6750 Combustion Phenomena**

CREDIT HOURS: 3

Mathematical formulations of combustion phenomena and their physical significance will be emphasized. Application of the conservation equations for multicomponent reacting flows by means of the Schwab-Zeldovich formulation will be demonstrated. The general Rankine-Hugoniot relations will be developed to calculate properties across a shock front. Laminar and diffusion flames will be studied. Chemical reactions in boundary layers will be examined and turbulent combustion phenomena will be analyzed.

FORMATS: Lecture

### **CHEE 6751 Dust Explosion Risk Reduction**

CREDIT HOURS: 3

Reasons for the occurrence and severity of industrial dust explosions are explored using the explosion pentagon as a structure for analysis. Fundamental concepts of dust explosions are covered along with applicable prevention and mitigation methods. Emphasis is placed on promoting a scientifically rigorous approach to dust explosion risk reduction.

### **CHEE 6755 Colloids and Interfaces in Petroleum Engineering**

CREDIT HOURS: 3

This course examines the fundamental principles in colloidal and interfacial systems, with particular emphasis on their applications in petroleum

engineering. The first part of the course covers the theories of colloidal stability, interfaces, and surfactant solutions. These principles are then applied to analyze drilling-fluid design and enhanced oil recovery.

PREREQUISITES: CHEE 3530 or permission of instructor

FORMATS: Lecture | Tutorial

### **CHEE 6800 Chemical Engineering in Biological Systems**

CREDIT HOURS: 3

This course deals with the application of chemical engineering principles (stoichiometry, kinetics, transport phenomena) to analyze biological systems such as cells, organs, and organ systems. Applications include implants and medical devices, drug delivery systems, cell culture processes, diagnostics, immobilized enzymes, and pharmacokinetics.

PREREQUISITES: CHEE 3634, CHEE 4726, or permission of instructor

FORMATS: Lecture

### **CHEE 7000 Special Topics in Chemical Engineering II**

CREDIT HOURS: 3

This course is available to Graduate Students (pursuing a PhD degree) wishing to gain knowledge in a specific area for which no graduate level course is offered. Students will be assigned a course supervisor most familiar with the specific area of interest. Students will be required to present the work of one term consisting of at least 90 hours in the form of directed research, tutorials, and individual study, in an organized publication format.

PREREQUISITES: Instructor's permission

### **CHEE 8900 MEng Project**

CREDIT HOURS: 6

A Master of Engineering candidate will be required to submit a project satisfactory to the Faculties of Graduate Studies and Engineering and to make a successful oral presentation of the work.

FORMATS: Other (explain in comments)

### **CHEE 9000 Master's Thesis**

CREDIT HOURS: 0

### **CHEE 9530 PhD Thesis**

CREDIT HOURS: 0

## **Food Science Program**

### **Courses**

Not all courses are offered every year. Please consult the current timetable for this year's offerings.

## **Courses**

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **FOSC 6325 Fish/Food Processing II**

CREDIT HOURS: 3

This course will examine various unit operations in food processing. Topics examined will include low temperature processes (chilling and freezing); thermal processing including commercial blanching, pasteurization, and sterilization; drying and non-thermal processes including high pressure processes and irradiation. The unit operations of various food and seafood commodities will be examined in detail.

PREREQUISITES: Permission of instructor

CROSSLISTED: FOSC 4070

### **FOSC 6328 Advanced Food Chemistry**

CREDIT HOURS: 3

This course is designed to cover advanced topics in food chemistry with emphasis on their relationships to fundamental principles. The course consists of lectures and laboratory projects, and incorporates the following topics: water relations, carbohydrates, amino acids, peptides, proteins, lipids, additives, colloids, phytosystems and post-harvest physiology.

CROSSLISTED: FOSC 3010

### **FOSC 6329 Chemistry of Fats, Oils and Lipids**

CREDIT HOURS: 3

The difference in physical and chemical properties of natural fatty acids are correlated with the physical nature of fats, oils and lipids, and the chemical combinations of fatty acids with glycerol, amino acids, fatty alcohols, sterols and other chemical materials. Methods of separation such as chromatography, solubility and crystallization are explained in terms of the molecular properties. Important industrial processes and products are included.

CROSSLISTED: FOSC 4020

### **FOSC 6333 Industrial Rheology**

CREDIT HOURS: 3

This course deals with rheological principles of fluid materials employed in the food, mineral and chemical process industries. Rheometric techniques including co-axial, cone and plate, capillary and in-line rheometers are examined. The behaviour of flocculent and non-flocculent suspensions is discussed in light of present rheological theories. The viscoelastic properties of selected colloidal, polymer and biological systems will also be examined.

### **FOSC 6351 Directed Studies I**

CREDIT HOURS: 3

This course allows students pursuing an MSc degree to gain knowledge in a specific area in which no graduate level course is offered. The course involves a directed research or design project for which the student will be given credit. Students are assigned a suitable area of interest and are required to present the work of one term (not less than 90 hours in the form of directed research, tutorials, and individual study), in a written report.

### **FOSC 6381 Advanced Brewing Science**

CREDIT HOURS: 3

This course will examine the unit operations employed during the production of malt and beer. Brewing, fermentation, and packaging aspects of beer production as well as brewing quality assurance, colloidal stability and haze development will be discussed.

CROSSLISTED: FOSC 4081.03

FORMATS: Lecture | Lab | Tutorial

### **FOSC 7351 Directed Studies II**

CREDIT HOURS: 3

This course allows students pursuing a PhD degree to gain knowledge in a specific area in which no graduate level course is offered. The course involves a directed research or design project for which the student will be given credit. Students are assigned a suitable area of interest and are required to present the work of one term (not less than 90 hours in the form of directed research, tutorials, and individual study) in a written report.

**FOSC 9000 Master's Thesis**

CREDIT HOURS: 0

**FOSC 9530 PhD Thesis**

CREDIT HOURS: 0

## Process Engineering and Applied Science

### Courses

Not all courses are offered every year. Please consult the current timetable for this year's offerings.

### Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

**PEAS 6000 Research Methodology**

CREDIT HOURS: 3

This course serves as a basic introduction to research. Structurally, the course material follows each step of the research process, from literature review to experimental design and analysis, with significant emphasis on statistics.

**PEAS 6010 Instrumental Methods**

CREDIT HOURS: 3

This class will provide a broad overview of common instrumentation used in chromatography and spectroscopy. Basic theory of operation and practical applications will be discussed, as well as common sample pre-treatment techniques. The laboratory sessions will provide students with hands-on experience in the operation of instrumentation, compilation of data and calculation of results.

CALENDAR NOTES: Initially offered in Fall 2017.

FORMATS: Lecture | Lab

**PEAS 6020 Biomass Valorization**

CREDIT HOURS: 3

This course will provide a broad overview of biomass valorization, which involves the transformation of biomass to useful products by extraction or conversion processes. The focus will be mainly on food waste and recovery strategies for obtaining several compounds to maximize the value of the processing by-products and improve the sustainability of food production. Examples of high added-value biomolecules from typical food industries will be discussed, as well as processing technologies and techniques that can be used for recovering target compounds, and commercial considerations.

FORMATS: Lecture

### **PEAS 6040 Life Cycle Assessment**

CREDIT HOURS: 3

Current approach of solving environmental issues is often focused on the individual problem, which may result in transferring the environmental impact from one sector to the other. System thinking enables understanding the complexity of environmental issues and helps with informed decision to address these issues from system perspective. This course aims to introduce the concept of life cycle assessment (LCA) and system thinking. The scope of the course extends to develop critical thinking for the assessment of the environmental impact of products and processes. Qualitative and quantitative analysis required to conduct life cycle assessment, life cycle cost analysis, major phases in LCA and analysis of multiple output processes and multifunctional product systems will be covered. Four major phases involved in LCA including “Goal and Scope”, “Inventory Compilation”, “Impact Assessment” and “Interpretation” will be examined through assignments, term project and various in-class activities.

COREQUISITES: None

CROSSLISTED: None

RESTRICTIONS: Bachelor of Engineering. The course is also available to undergraduate engineering students in their final year with permission from the instructor.

EXCLUSIONS: None

FORMATS: Lecture

### **PEAS 6250 Advanced Transport Phenomena**

CREDIT HOURS: 3

This course deals with advanced mathematical and physical topics in transport phenomena. Both the macroscopic and microscopic conservation laws of mass, heat and momentum transport are built and solved for analytically. Diffusion and convection physics are presented, for multi-dimensional, transient, and coupled phenomena. Multiphase processes are also introduced.

PREREQUISITES: MECH3305.03 and MECH3705.03, or PEAS3600, or equivalent or instructor's permission

CROSSLISTED: MECH6250.03

FORMATS: Lecture | Tutorial

### **PEAS 6710 Graduate Research Symposium I**

CREDIT HOURS: 0

All students enrolled in the MASc, MEng and MS degree programs are required to participate in this course. The course is designed to provide students with the opportunity and experience of interacting with their peers, faculty and profession. There will be an annual research symposium which will include guest speakers and/or panel discussion on topical issues presented by scholars from industry, government and academia and oral and poster presentations by students. One 30-minute oral presentation and one poster presentation must be given by the students at the department symposia during the student tenure. Students will be evaluated on quality of handouts, organization and preparation of material, presentation skills, technical content, knowledge of the subject, critical judgment of reference material and ability to answer questions. Graded pass/fail.

CALENDAR NOTES: This course is to replace Graduate Seminar I in all programs.

### **PEAS 6803 Computer Aided Process Engineering and Management**

CREDIT HOURS: 3

This course explores engineering software relevant to the process engineering and management fields, with the course focus each year catered towards staple and emerging technology standards and application of these software tools in engineering practice, process design and management systems.

PREREQUISITES: Instructor approval - Capacity limitations require priority to be given to MEng students within PEAS.

FORMATS: Lecture

### **PEAS 7710 Graduate Research Symposium II**

CREDIT HOURS: 0

All students enrolled in the Ph. D degree program are required to participate in this course. The course is designed to provide students with the opportunity and experience of interacting with their peers, faculty, and profession. There will be an annual research symposium which will include guest speakers and/or panel discussions on topical issues presented by scholars from industry, government and academia and oral and poster presentations by students. Two 30-minute oral presentations and two poster presentations must be given by the student at the department symposia during the student tenure. Students will be evaluated on quality of handouts, organization and preparation of material, presentation skills, technical content, knowledge of the subject, critical judgement of reference material and ability to answer questions. Graded pass/fail.

CALENDAR NOTES: This course is to replace Graduate Seminar II in all programs.

## **Psychiatry**

Location:

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## Introduction

### Training the next generation of clinicians, educators, and researchers

The Department of Psychiatry is a clinical academic department within the Faculty of Medicine at Dalhousie University in Halifax, Nova Scotia. Our mission is threefold—to provide excellent clinical care, superior educational programs and support cutting edge research in psychiatry.

We offer undergraduate, graduate, postgraduate and continuing education in psychiatry within the Faculty of Medicine. Our five-year residency program trains the next generation of psychiatrists with help from over 100 faculty members serving the child and adolescent, adult and senior populations and our M.Sc. and Ph.D. programs equip students with the skills and knowledge needed to succeed as professionals in clinical and neuroscience research concerning mental health and illness.

The department boasts a very strong research program and collaborates with researchers anywhere from across the street to around the world.

Members of the department provide expert secondary and tertiary mental health care to the people of Nova Scotia, New Brunswick and Prince Edward Island within the mental health and addictions programs at the Nova Scotia Health Authority and the IWK Health Centre.

## Staff

**Interim Department Head**  
Morrison, J.

**Graduate Coordinators**  
Good, K.  
Stewart, S.

## Admission Requirements

### What are we looking for?

Admission to the M.Sc. program will require an undergraduate Bachelor's Honours degree, or equivalent from a recognized University. Applicants with non-honours Bachelor's degrees may be considered for admission based on subsequent equivalent research experience (e.g., honours equivalent). Admission to the Ph.D. program will require a Masters' level research degree from a recognized University. For either the M.Sc. or Ph.D. program, students may be accepted with degrees in a variety of relevant science disciplines, including, for example, neuroscience, psychology, biology, medical sciences, biochemistry, etc.

Applicants will be required to identify one or more faculty members in Psychiatry who might serve as thesis supervisors. It is expected that students will contact these faculty members at the time of application and discuss the faculty member's potential role as supervisor. A faculty member must agree to serve as the student's thesis research supervisor for the full duration of the degree program before a student can be admitted. Joint supervision ("co-supervision") will be permitted.



Applicants must arrange for at least two individuals who are familiar with their academic and research experience and their potential as psychiatric researchers to complete and submit reference letters directly to the Department of Psychiatry. Applicants must also submit a written personal statement describing their goals and interests with respect to the program, as well as indicating a potential research supervisor/co-supervisors and topic within the department and a current copy of their CV listing funding, publications, and presentations to date. Applicants must satisfy the general requirements for admission to the Faculty of Graduate Studies.

## Master of Science (MSc)

### Full-time Program

The two-year graduate program equips students with the skills and knowledge needed to succeed as professionals in clinical and neuroscience research concerning mental health and illness. The coursework covers relevant current topics including clinical trials, genetics, neuroimaging, participatory research, psychotherapy research, early interventions, and personalized psychiatry. Students will improve their skills in critical appraisal, study design, statistics, data analysis, and scientific writing. Each student will complete an independent Masters' thesis research project under the supervision of one of our faculty.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## MSc in Psychiatry Research Courses

The MSc in Psychiatry Research program is a two-year Masters Degree program with a thesis and a one year residency requirement.

Students will be required to take two core courses (coordinated and led by members of our department), one elective course related to their area of interest (which may be offered by other Departments), and a statistics course.

## Course Descriptions

### PSYR 5001 Independent Study

CREDIT HOURS: 3

Students work closely with a faculty supervisor on a topic of mutual interest. Study may focus on laboratory research or library research and empirical, methodological, theoretical and/or professional issues may be covered. A final report is required.

FORMATS: Experiential Learning

### PSYR 6001 Core Perspective on Psychiatric Disorders

CREDIT HOURS: 3

The purpose of this course is to take a biopsychosocial approach to understanding neuropsychiatric and psychiatric disorders, with an emphasis on the biological mechanisms underlying these disorders. Current Diagnostic and Statistical Manual of Mental Disorders (DSM 5) classifications will be covered as will major theories of etiology. The course will also include an overview of the evidence on empirically supported treatments for each disorder as well as some pertinent and timely information on cross cultural and early intervention approaches.

PREREQUISITES: No prerequisites are required; however, students are expected to have some familiarity with the neuroscience of psychiatric disorders and/or undergraduate abnormal behavior (PSYO/NESC 2007; PSYO/NESC 2220). Students outside of the MScP program require course director's approval.

FORMATS: Lecture | Seminar | Discussion

### PSYR 6002 Fundamentals of Psychiatry Research

CREDIT HOURS: 3

This course will cover aspects of psychiatric research methods and design. It will touch on aspects of research methodology that are common to most forms of medical research but focus on those that are specific to research on psychiatry and mental disorders. The format of each class will involve a combination of faculty didactic lectures and student-led presentations or hands-on applications of the topic (e.g., during the neuroimaging class, students will participate in a hands-on imaging session at BIOTIC). Students will complete the course by presenting their thesis proposal (or equivalent see below) to the class.

PREREQUISITES: No prerequisites are required; however, students are expected to have some familiarity research methods and design (e.g., PSYO 2000; PSYO 3122). Students outside of the MScP program require course director's approval.

FORMATS: Lecture | Seminar | Discussion

### **PSYR 6003 Fundamentals of Applied Statistics and Research Design**

CREDIT HOURS: 3

The purpose of this course is to provide an overview of core statistical procedures in psychiatry with an emphasis on the general linear model. Common methods of analysis using multiple software packages will be covered as will the theory behind the methodology. The course will also include an overview of the scientific method as it pertains to statistical analysis and how to apply the learned statistical procedures as a function of type of data, experimental design, and hypotheses under investigation.

PREREQUISITES: No prerequisites are required; however, students are expected to have some knowledge of basic statistics, equivalent to one or more undergraduate courses in statistics. This includes a general understanding of undergraduate-level statistical principles such as inferential statistics, p-values, confidence intervals, error, and hypothesis testing). Students outside of the MScP program require the course director's approval.

FORMATS: Lecture | Lab

### **PSYR 6011 Advanced Experiential Psychiatry**

CREDIT HOURS: 3

The purpose of this course is to impart an understanding of the practice of clinical mental health care and the experience of having a mental illness. The classroom learning will focus on the organization of mental health care including diagnostic nomenclature and prominent issues in mental health care. One focus will be on diversity and include examination of the situation of aboriginal and indigenous Black individuals, racial and sexual minorities and the poor.

The lab portion of the course will involve experiences with patients, providers, and clinical residents. Students will keep a journal of their experiences. A product, such as a blog, an opinion piece for a journal or an advocacy document is required. The nature of the product is negotiable with the instructor.

PREREQUISITES: PSYR 6001.03 Core Perspectives on Psychiatric Disorders or equivalent. Students are expected to have some coursework or experience demonstrating knowledge of psychopathology and diagnosis. Students outside of the PhD program require course director's approval.

FORMATS: Lecture | Experiential Learning

### **PSYR 6015 Advanced Methods, Statistics & Analysis**

CREDIT HOURS: 3

The purpose of this course is to impart an understanding of the advanced methods, statistics and analysis in the psychiatric research area that is the student's field of study. Students in the PhD in Psychiatry Research may be focusing on clinical trials, epidemiological studies, genetic analysis, or analysis in imaging. Each field of study uses very different statistics. Thus, each student's course will be personalized to meet the needs of their area by the course instructor in close collaboration with the student's research supervisor. The requirements may be fulfilled by taking an appropriate course, by workshops or by independent study or a combination of these. Students will be required to demonstrate competence by exam or a set of completed analyses.

PREREQUISITES: PSYR 6003.03 Fundamentals of Applied Statistics and Research Design or equivalent. Students are expected to have some familiarity with graduate level research methods and design (e.g., PSYR 6002.03).

FORMATS: Discussion

### **PSYR 8000 Doctoral Comprehensive Requirement**

CREDIT HOURS: 0

Following completion of course work, students will register in the Doctoral Comprehensive Requirement while they prepare for, and until they have passed, the Comprehensive Examination.

### **PSYR 8100 Psychiatry Grand Rounds and Research Day**

CREDIT HOURS: 0

The purpose of this course is to help trainees understand the breadth of psychiatry clinical work and research by attendance and participation in Grand Rounds of the Department of Psychiatry at Nova Scotia Health Authority and the University Department.

### **PSYR 9000 M.Sc. Thesis**

CREDIT HOURS: 0

## **PSYR 9530 PhD Thesis**

CREDIT HOURS: 0

# **Psychology and Neuroscience**

Location:

Life Sciences Centre

1355 Oxford Street

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3417

Fax Number: (902) 494-6585

Email Address: [gradprog@dal.ca](mailto:gradprog@dal.ca)

Website: [www.dal.ca/psychandneuro](http://www.dal.ca/psychandneuro)

## **Staff**

### **Chairperson of Department**

**Newman, A.**

### **Graduate Coordinator**

**Adamo, S.**

### **Professors Emeriti**

**Brown, R.E.**, BSc (Victoria), MA, PhD (Dalhousie). Behavioural endocrinology, developmental psychobiology, drugs and behaviour, behaviour of transgenic and mutant mice, development, animal behaviour, Memory

**Klein, R. M.**, BA (SUNY), MA, PhD (Oregon), FRSC, University Research Professor. Attention and its disorders, cognitive neuroscience, applied cognitive psychology

**LoLordo, V. M.**, AB (Brown), PhD (Penn). Learning, animal behaviour

**Meinertzhagen, I. A.**, BSc (Aberdeen), PhD, DSc (St. Andrews), University Research Professor. Structure and development of simple nervous systems

**Mitchell, D. E.**, BSc, MAsC (Melb), PhD (Berkeley). Visual system development, visual perception

### **Professors**

**Abbass, A.**, BSc (Ottawa), MD (Dalhousie), FRCPC (Toronto), major appointment in Psychiatry. Emotion physiology, short-term dynamic psychotherapy, psychotherapy integration, anxiety, depression, somatization

**Adamo, S.**, BSc (Toronto), PhD (McGill), Graduate Coordinator, Cephalopod behaviour, invertebrate behavioural physiology, comparative psychoneuroimmunology, ecoimmunology

**Barrett, S. P.**, BA (St. FX), PhD (McGill). Addiction, polysubstance use, alcohol, tobacco, gambling, psychiatric comorbidity, human psychopharmacology

**Campbell-Yeo, M.**, BScN, MScN (Dalhousie), PhDN (McGill), major appointment in the School of Nursing. Non-pharmaceutical pain relief, maternal-led interventions, pain and stress, skin-to-skin contact, breastfeeding, neonatal intensive care, randomized controlled clinical trials

**Chambers, C. T.**, BSc (Dalhousie), MA, PhD (UBC), Faculty of Science Killam Professor in Psychology, joint appointment in Pediatrics. Health psychology, pain, children, families, clinical psychology, social media, knowledge translation

**Corkum, P.**, BSc (Dalhousie), MA, PhD (OISE at Toronto). Sleep and childhood psychopathology, psychosocial interventions, school psychology, eHealth

**Crowder, N. A.**, BSc, PhD (Alberta). Using visual neurophysiology and psychophysics to investigate the following topics: adaptation

and plasticity of visual information processing in the cortex, contrast coding, motion detection, speed discrimination

**Deacon, S. H.**, BSc (UPEI), PhD (Oxon), Faculty of Science Killam Professor in Psychology. Reading and spelling development, bilingualism, reading difficulties

**Duffy, K.**, BA (St. Thomas), PhD (McMaster). Function, organization, and development of the mammalian visual system; impact of sensory experience on neural network development and plasticity

**Eskes, G. A.**, BA, PhD (Berkeley), joint appointment in Psychiatry. Clinical and cognitive neuropsychology, cognitive rehabilitation, disorders of attention, memory and executive function, sleep disorders, aging, stroke, dementia, cognition and emotion, functional brain imaging

**Finley, G. A.**, BSc, MD (Dalhousie), FRCPC, major appointment in Anaesthesia. Pediatric pain (measurement and management), audible alarm signals, perioperative anxiety, awareness, and memory

**Good, K.**, BSc (UNB), MSc, PhD (UBC), major appointment in Psychiatry. Olfactory and cognitive function in patients with psychotic disorders, and olfactory fMRI

**Kay-Raining Bird, E.**, BA (Queen's), MSc (Columbia), PhD (Wisconsin-Madison), major appointment in the School of Human Communication Disorders. Child language development and disorders, Down syndrome, autism, language assessment and intervention, literacy

**Kieft, M.**, BA (Memorial), MSc, PhD (Alberta), major appointment in the School of Human Communication Disorders. Speech perception, psychoacoustics, speech production, stuttering

**Moore, C. L.**, BA, PhD (Cantab). The development of commonsense psychology and the understanding of intentionality

**Newman, A. J.**, BA (Winnipeg), MSc, PhD (Oregon). Neuroplasticity and language processing: neural bases of signed vs. spoken language; effects of deafness on brain development; gesture; second language acquisition; Aboriginal languages; neuroimaging with fMRI and ERP; clinical applications of cognitive neuroimaging

**Perrot, T. S.**, BSc, PhD (Western). Molecular mechanisms of sexual differentiation of rat brain; developmental programming of adult stress responding sex and sex steroid modulation of adult stress responding

**Phillmore, L.**, BA (Western), MA, PhD (Queen's). Songbirds, animal behaviour and learning, seasonality, neural basis of song perception, neurogenesis

**Rusak, B.**, BA (Toronto), PhD (Berkeley), FRSC, joint appointment in Psychiatry. Sleep and circadian rhythms: mechanisms, functions, and clinical implications

**Semba, K.**, BEd, MA (Tokyo), PhD (Rutgers), major appointment in Medical Neuroscience. Neurobehavioral and physiological impacts of chronic sleep restriction, role of astrocytes in sleep/wake regulation, circadian control of sleep and waking

**Sherry, S. B.**, BA (York), MA (UBC), PhD (Saskatchewan). Personality and psychopathology (e.g., suicide, eating disorders, and depression), perfectionism, hypochondriasis

**Smith, I. M.**, BA (Dalhousie), MSc (Brown), PhD (Dalhousie), Joan and Jack Craig Chair in Autism Research; major appointment in Pediatrics. Autism spectrum disorder, developmental disabilities, intervention research

**Stewart, S.**, BSc (Dalhousie), PhD (McGill), joint appointment in Psychiatry. Anxiety, substance abuse, cognitive psychophysiology, comorbidity, motives

**Taylor-Helmick, T. L.**, BA (Calgary), MSc, PhD (Dalhousie). Human memory, especially our ability to intentionally forget irrelevant or outdated information, attentional mechanisms that enable remembering and forgetting, inhibitory mechanisms in attention and memory

**Uher, R.**, MUDr, PhD (Charles Univ), MRCPsych (Royal College of Psychiatrists), CCT (London Deanery, UK), major appointment in Psychiatry. Early interventions to prevent severe mental illness, classification of psychopathology, the treatment of depression, the use of clinical assessment and genomics to personalize and optimize treatment and the interplay of genes and environment in the causation of mental illness

**Ungar, M.**, BA, BSW, MSW (McGill), PhD (Wilfrid Laurier), major appointment in the School of Social Work. Qualitative methods, resilience, adolescent mental health, family therapy, ecological social work, program evaluation, cross-cultural research, delinquency, child development, social constructionism

**Westwood, D. A.**, BSc, MA, PhD (Waterloo), major appointment in the School of Health and Human Performance. Cognitive neuroscience, sensory control of skilled action, functional neuroimaging

## Associate Professors

**Aiken, S.**, BA, MSc (Western), PhD (Toronto), major appointment in the School of Human Communication Disorders. Auditory electrophysiology, brainstem and cortical responses to speech, psychoacoustics, otoacoustic emissions, speech perception, hearing aid signal processing

**Bardouille, T.**, BSc (Queen's), MSc (Dalhousie), PhD (Toronto), major appointment in Radiology. Functional neuroimaging for the purposes of clinical diagnosis and treatment, measurement of small- and long-range neural synchrony in the brain in patients with stroke, epilepsy, and traumatic brain injury

**Boe, S.**, BPhEd (Brock), PhD, MPT (Western), major appointment in the School of Physiotherapy. Central and peripheral nervous system adaptations and functional outcomes in neurorehabilitation, cortical contributions to balance control, electrophysiology,

functional neuroimaging

**Bombay, A.,** BSc (Ottawa), MSc, PhD (Carleton), major appointment is jointly held in the School of Nursing and Psychiatry. Aboriginal health and the determinants of mental health outcomes among Aboriginal peoples of Canada

**Chorney, J.,** BSc (Dalhousie), MA, PhD (West Virginia), major appointment in Anesthesiology. Perioperative care, psychological management of pain

**Fisher, D.,** BSc (Ottawa), MSc, PhD (Carleton), major appointment in Psychiatry. Schizophrenia, psychosis, psychopharmacology, nicotine, cognitive neuroscience, EEG, event-related potentials, mismatch negativity

**Fisk, J.,** BSc, MA, PhD (Western), major appointment in Psychiatry. Neuropsychology, cognitive neuroscience, and neuroimaging; aging, multiple sclerosis, dementia, and neurodegenerative disorders: assessment, diagnosis, epidemiology, risk factors, health-related quality of life, treatment effectiveness, health policy

**Franklin, T.,** BSc (King's), MSc (Dalhousie), PhD (Swiss Fed Institute). Neuroscience, animal behaviour, sociability, epigenetics, in vivo electrophysiology, neuroconnectivity

**Jacques, S.,** BA (McGill), MA, PhD (Toronto). Socio-emotional and socio-cognitive development, cognitive development

**Johnson, S.,** BA (Kalamazoo), MSc, PhD (Victoria). Clinical PhD Program Director of Training. Clinical and cognitive neuropsychology, social cognition, neurodevelopmental and neurodegenerative disorders

**Meier, S.,** BSc, MSc (Universitat Basel, Switzerland), PhD (Ruprecht Karls Universität Heidelberg).

**Neyedli, H.,** BSc Hons (Dalhousie), MSc, PhD (Toronto), major appointment in Health and Human Performance. Decision making, statistical decision-making models, attention, movement selection and planning, neuroplasticity, and neurofeedback

**Robinson, L.,** BSc (Victoria), MA, PhD (Simon Fraser), major appointment in the School of Health and Human Performance.

Psychosocial issues in cancer, relationships, internet-mediated health promotion, health promotion, community-based research  
**Rosen, N. O.,** BA (Queen's), PhD (McGill). Female sexual disorders, women's pain, romantic relationships, health (psychosocial) psychology

**Weaver, I. C. G.,** BSc (Aberdeen), MSc (Bristol), PhD (McGill). Neurobehavioural epigenetic mechanisms, early life experience, steroid hormone function, DNA and chromatin modification, programming of gene expression, cortical development, endocrine and behavioural stress responses, and pharmacological and psycho-social interventions

## Assistant Professors

**Blais, J.,** BA/MA/PhD (Carleton). Risk assessment, risk communication, psychopathy, personality, political psychology.

**Dithurbide, L.,** BA (St. Mary's), MA (Brock), PhD (Michigan State), major appointment in the School of Health and Human Performance. Sport and exercise psychology, group/team dynamics, efficacy and trust in dyads/groups/teams, athletic performance, measurement of psychosocial variables in sport

**Filliter, J.,** BSc, MSc, PhD (Dalhousie) major appointment in Pediatrics. Autism spectrum disorder (ASD), improving health care access and interactions for youth with ASD, understanding cognitive and emotional processes in ASD

**Hashimi, J.,** BSc (Punjab), MSc (Western), PhD (Toronto), major appointment in Anesthesia. Acute and chronic pain, anesthesia, brain development, networks, predictive analysis

**Ilie, G.,** BSc, MA (York), PhD (Toronto), major appointment in Community Health and Epidemiology. Patient reported outcomes, prostate cancer, traumatic brain injuries, concussions, quality of life, mental health, substance use, health reported outcomes, behavioural conduct, violence, bullying, suicide, music therapy, stress relief, and mindfulness

**Lee-Bagley, D.,** BSc (Calgary), MA, PhD (UBC). Major appointment in Family Medicine. Chronic disease, behaviour change, obesity, professional resiliency, acceptance, and commitment therapy

**Lovas, D.,** BSc, MD (Dalhousie), major appointment in Psychiatry. Somatic symptom disorders, somatization, chronic pain, functional disorders, biomarkers, mindfulness, child, and adolescent psychiatry

**Pavlova, B.,** MSc (Palacky Univ., Czech Republic), PhD (Charles Univ., Czech Republic), DCLinPsy (Inst. of Psychiatry, King's College, UK)

**Town, J.,** BSc (York), DCLinPsy (Univ of Sheffield), major appointment in Psychiatry. Psychotherapy process-outcome and effectiveness research, emotion processing, short-term dynamic psychotherapy, psychotherapy for common mental disorders, medically unexplained symptoms

**Weatherhead, D.,** COGS-P-BCH (Queen's), PhD (Waterloo). Language acquisition, sociolinguistics, social cognition, cognitive development, infancy

**Yakovenko, I.,** BSc (Toronto), MSc (Calgary), PhD (Yale), joint appointment in Psychiatry. Change determinants across addictive behaviours, Transdiagnostic addiction and comorbidity, Cannabis use and disordered gambling, Online substance use interventions

## University Teaching Fellows

**Gadbois, S.,** BP, MAPs (Moncton), PhD (Dalhousie). Olfactory detection, discrimination, searching and tracking in dogs; wildlife conservation dogs; behaviour of wild canids (wolves, coyotes, and red foxes)

**Stamp, J.,** BSc (Dalhousie), PhD (Cambridge). Stress, addiction, steroid hormones, and behaviour

**Stevens, L.,** BSc (Acadia), MSc, PhD (Dalhousie), Undergraduate Program Coordinator

## Senior Instructors

**Borycz, J.**, PhD (Inst. of Pharmacology, Krakow, Poland). Invertebrate neural signalling, neurotransmitter release and recycling, transmembrane transporters, HPLC, microdialysis.

**Christie, J.**, BSc, MSc, PhD (Dalhousie). Attention, memory, and learning.

**Juckes, T.**, BA, MA (Natal), PhD (Dalhousie). Sociopsychology, history of psychology, social influence, scientific writing, cognitive development

**Mackinnon, S.**, BA(H) (UCCB), MSc (Wilfred Laurier), PhD (Dalhousie). Personality, multivariate statistics, alcohol, well-being, relationships.

**Pencer, A.**, BSc (St. FX), MSc, PhD (Calgary). Emerging adults, anxiety disorders, obsessive-compulsive disorder, early interventions for severe mental illness, first episode psychosis, anxiety disorders, addictions

## Instructors

**Stratton, N.**, BA (Concordia) MA/PhD (Ryerson). Sexual function/dysfunction, sexual and mental health interventions, mood disorders, anxiety and anxiety-related disorders, borderline personality disorder, clinical psychology, and health psychology.

## Adjunct (FGS)

**Barresi, J.**, BSc (Brown), MA (S. Calif.), MS, PhD (Wisconsin), Psychology and Neuroscience/Dalhousie. Personology, social cognition, philosophical psychology, history of psychology

**Champod, A.S.**, BSc (Montreal), PhD (McGill) Psychology/Acadia

**Chipman, K.**, BA (UPEI), MA, PhD (Western), Neuropsychology Service/Nova Scotia Hospital. Neuropsychology, cognitive rehabilitation, functional outcomes, aging, mild cognitive impairment (MCI), dementia and neurodegenerative disorders, schizophrenia, affective disorders, family/caregiver support

**Church, E.**, BA (St. John's), MA, PhD (Toronto), School Psychology/Mount Saint Vincent University. Stepfamilies, parenting, self-help, rural mental health, interprofessional collaboration

**Cohen, A.**, BA (McGill), MA, PhD (Queen's), Psychology/University of Prince Edward Island

**Conrad, N.**, BA (St. Mary's), PhD (McMaster), Psychology/St. Mary's University. Development of reading skills, memory, cognitive and linguistic factors related to reading and spelling

**DiGiorgio, C.**, BA (UCCB) BSc, BEd (Dalhousie), MEd (St. FX), PhD (Univ. South Australia)

**Ellsworth, C.**, BA (McMaster), MA, PhD (Queen's), Psychology/IWK Health Centre. Neurodevelopmental disorders (infants and preschoolers), early identification, parent education and support

**Flanagan, H.**, BA/BSc (McMaster), MA, PhD (York), Psychology/IWK. Intervention for young children with Autism Spectrum Disorder (ASD), developmental trajectories in ASD, parent coaching

**Gilin Oore, D.**, BSc (Northern Michigan), MA, PhD (Missouri-St. Louis), Psychology/St. Mary's University. Managerial decision making, conflict escalation and resolution, interpersonal and organizational change

**Ivanoff, J.**, BSc, MA (Guelph), PhD (Dalhousie), Psychology/St. Mary's University. Attention, decision-making, executive control, response preparation, cognitive neuroscience, functional magnetic resonance imaging, event-related potentials

**Lackner, C.**, MSc (Queen's) PhD (Brock), Psychology/Mount Saint Vincent

**LoLordo, V. M.**, AB (Brown), PhD (Penn), Psychology and Neuroscience/Dalhousie. Learning, animal behaviour

**MacNeil, B.**, BSc (St. FX), PhD (New Brunswick) Mental Health and Addictions/QEII Health Sciences Centre

**Marchand, Y.**, MCS (Univ. of Paris), PhD (Compiègne, France). Computational modeling of reading, dyslexia, speech technology, event-related brain potentials

**Mitchell, D. E.**, BSc, MSc (Melb), PhD (Berkeley), Psychology and Neuroscience/Dalhousie. Visual system development, visual perception

**Omisade, A.**, BA (York), PhD (Dalhousie), Neuropsychology/QEII Health Sciences Centre. Clinical neuropsychology, cognitive neuroscience and neuroimaging, epilepsy, neurodegenerative disorders, assessment: early detection of cognitive impairment and lateralization of cognitive functions

**O'Neill, P.**, MSc, PhD (Yale), Professor Emeritus/Acadia University. Ethical decision making, community psychology

**Rigney, G.**, BHons, PhD (South Australia) Psychology/CQUniversity Adelaide

**Robertson, E.**, BA (Mt. A), MA, PhD (Western), Psychology/Cape Breton University. Language and reading development and disorders in children, speech perception, phonology, morphology, syntax, working memory

**Rodger, R. S.**, MA (Edin), PhD (Queen's, Belfast). Statistical methodology; especially the evaluation of multiple, null contrasts against their alternatives (parametric and non-parametric), using decision-based error and detection rates

**Roy-Charland, A.**, BPs, MAPs, PhD (Moncton). Social cognition, development, reading, emotional facial expressions, eye movements

**Saint-Aubin, J.**, BA (Sherbrooke), MPs, PhD (Laval), École de psychologie/Université de Moncton. Missing-letter effect, working memory, eye movements, shared book reading

**Schellinck, H.**, BSc, MSc, PhD (Dalhousie), Psychology and Neuroscience/Dalhousie. Olfactory learning in animal models of

neurodegenerative disease; pheromonal mechanisms in rodents

**Shaw, S. R.**, BSc (London), PhD (St. Andrews), Psychology and Neuroscience/Dalhousie. Insect sensory neurophysiology, visual optics, single neuron evolution, light- and electron-microscope neuroanatomy

**Smith, S. M.**, BA (Bishop's), MA, PhD (Queen's), Psychology/St. Mary's University. Attitudes and persuasion, attitude change, behaviour change, health promotion, psychology and law, eyewitness identification, confession evidence, media and persuasion, media, and the legal system

**Vallis, T. M.**, BSc (Dalhousie), MA, PhD (Western), Psychology/QEII Health Sciences Centre. Health psychology, diabetes, gastroenterology, cardiovascular risk reduction, obesity, motivational readiness to change, cognitive therapy

**Watt, M.**, BA (St. FX), PhD (Dalhousie), Psychology/St. Francis Xavier University. Anxiety, cognitive-behavioural interventions, health-related behaviour, forensic psychology

### **Clinical Associate (Faculty of Science Appointment)**

Appointments with the Clinical Associate designation are expected to be actively involved in the Clinical Psychology Program through a variety of activities such as being practicum supervisors for Clinical students and leading workshops. This type of appointment is not eligible for supervision of student research.

**Angelopoulos, M.**, PhD (Dalhousie), Psychology/QEII Health Sciences Centre

**Aubie, C.**, PhD (Windsor), Eating Disorders Clinic/Early Psychosis Program/QEII Health Sciences Centre

**Balch, M.**, PhD (UNB), Community Mental Health (Sackville Site)/IWK Health Centre

**Battista, S.**, PhD (Dalhousie), CHOICES Adolescent Treatment Program/IWK Health Centre

**Beattie, T.**, PhD (UNB), Neuropsychology Service/IWK Health Centre

**Boehm, R.**, PhD (Windsor), Addictions Services/Nova Scotia Health Authority

**Bradley, K.**, PhD (Ottawa) Community Mental Health/IWK Health Centre

**Carter, S. L.**, PhD (Windsor), Psychology/QEII Health Sciences Centre

**Chatman, J.**, PhD (UCLA), Dr. Jason Chatman Psychological Services

**Chorney, D.**, PhD (West Virginia), Chorney and Associates (Private Practice)

**Clark, S.**, PhD (Dalhousie), Mental Health and Addictions/IWK Health Centre

**Cohen, J.**, PhD (UNB), Borderline Personality Disorder Treatment Program/East Coast Forensic Hospital

**Connors, A.**, PhD (Simon Fraser), Forensic Sexual Behaviour Program/Nova Scotia Hospital

**Connors, L.**, PhD (York), Community Mental Health, IWK Health Centre

**Coolican, J.**, PhD (Dalhousie), Feeding Clinic/IWK Health Centre

**Corkum, V.**, PhD (Dalhousie), Corkum & Associates Psychological Services

**Day, V.**, PhD (Queen's), Marsh-Knickle and Associates

**DeFreitas, C.**, PhD (SFU), Recovery and Integration Dept./NS Health

**DeFreitas, V.**, PhD (Simon Fraser) Acquired Brain Injury Program/Nova Scotia Rehabilitation & Arthritis Centre

**Durdle, H.**, PhD (Windsor), CHOICES Adolescent Treatment Program/IWK Health Centre

**Emberly, D.**, PhD (Dalhousie), Mental Health and Addictions/IWK Health Centre

**Farquhar, J.** PhD (Concordia), Coastal Psychology

**Fougere, A.**, PhD (Monash) Forensic Sexual Behaviour Program/Nova Scotia Health Authority

**Freeman, P.**, PhD (Manitoba), Community Mental Health Services (Dartmouth)/Nova Scotia Hospital

**Gamberg, S.**, PhD (McGill), Borderline Personality Disorder Treatment Program (BPSTP)/Nova Scotia Health Authority

**Gillespie, J.**, PhD (Western), Pediatric Health Psychology Service/IWK Health Centre

**Gorodinsky, A.**, PhD (Wisconsin-Milwaukee), Pediatric Complex Pain Service, IWK Health Centre

**Howes, J.**, PhD (Western Ontario), Psychology/QEII Health Sciences Centre

**Jefferson, S.**, PhD (UNB), Psychology/QEII Health Sciences Centre

**Jerrott, S.**, PhD (Dalhousie), Community Mental Health/IWK Health Centre

**Jewer, C.**, MSc (Acadia), Mental Health Services/Canadian Armed Forces

**Joyce, A. M.**, PhD (Dalhousie), Community Mental Health (Dartmouth Site)/IWK Health Centre

**Kayfitz, A.**, PhD (Windsor), IWK Mental Health and Addictions Program/Dartmouth Community Mental Health

**Kelln, B.**, PhD (Calgary), East Coast Forensic Hospital

**Kelly, B.**, PhD (South California), Community Mental Health (Dartmouth)/IWK Health Centre

**Lefebvre, C.**, PhD (Dalhousie), Youth Forensic Services/IWK Health Centre

**Lowe-Pearce, C.**, PhD (Dalhousie), Clinical Neurosciences and Rehabilitation Care/IWK Health Centre

**MacNeil, S.**, PhD (UNB), Canadian Forces Mental Health Services Centre (Atlantic), Mental Health Services

**McAfee, S.**, PhD (UNB) IWK Community Mental Health

**McInerney, R. J.**, PhD (Victoria), Dr. Robert J. McInerney & Associates (Private Practice)

**McLaughlin, E.**, PhD (Dalhousie), Pediatric Health Psychology/IWK Health Centre

**McNeill, B.**, PhD (Queen's), The Garon Centre for Child and Adolescent Mental Health (Inpatient) and The OCD Specific Care

Clinic/IWK Health Centre

**Patry, B.**, PhD (Victoria), Psychology, Nova Scotia Rehabilitation Centre/QEII Health Sciences Centre

**Poisson, M.**, PhD (McGill), Community Mental Health Service (Halifax Branch)/IWK Health Centre

**Quon, E.**, PhD (Concordia), IWK Health Centre, Dartmouth Site

**Ross, M.**, PhD (Saskatchewan), Mental Health Services (Bedford-Sackville)/Cobequid Community Health Centre

**Scattolon, Y.**, PhD (UNB Fredericton), Eating Disorders Clinic/QEII Health Sciences Centre, and Private Practice

**Starzomski, A.**, PhD (UBC), East Coast Forensic Hospital

**Sullivan, A.**, PhD (York), Mental Health and Addictions Program/IWK Health Centre

**Uman, L.**, PhD (Dalhousie), Community Mental Health (Dartmouth)/IWK Health Centre

**Wetmore, A.**, MEd (Acadia) (Private Practice)

**Yazbek, A.**, PhD (New Brunswick) Preschool Pediatric Psychology Service/IWK Health Centre

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies. Individuals interested in applying for a position in one of the Psychology and Neuroscience programs must submit at least two letters of reference, official copies of all undergraduate and graduate transcripts, application fee, and GRE scores (verbal, quantitative and analytic); GREs apply to Psychology and Neuroscience (Experimental) and Clinical Psychology program applicants. Students should have at least a B+ average in their last two years. A letter from the applicant indicating his/her research and career interests is strongly recommended. Applicants for admission to the Clinical program must submit an additional reference letter which focuses on their clinical experience and/or suitability for work in clinical psychology.

## Degree Programs

The Department of Psychology and Neuroscience offers graduate training leading to MSc and PhD degrees in Psychology and Neuroscience (Experimental or Neuroscience streams), and to a PhD degree in Clinical Psychology. Master's level students in Psychology and Neuroscience (Experimental or Neuroscience streams) are expected to advance into the corresponding PhD programs. The Department does not have a "terminal" Master's program, nor does it offer a Master's degree in Clinical Psychology.

## Psychology and Neuroscience (Experimental Stream)

The graduate programs in Psychology and Neuroscience emphasize training for research. They are best described as "apprenticeship" programs in which students work closely with a faculty member who has agreed to supervise the student's research. Compared with many other graduate programs, the Department places less emphasis on course work and greater emphasis on research, scholarship, and independent thinking.

### ***Master of Science (MSc) in Psychology and Neuroscience (Experimental stream)***

In addition to the Master's thesis (PSYO 9000.00), which is the major requirement of this program, the Master's student must complete the following courses:

- PSYO 6001.03: Fundamentals of Statistics and Experimental Design
- PSYO 7501.03: Proseminar: Methods of Psychological Inquiry I
- PSYO 7502.03: Proseminar: Methods of Psychological Inquiry II
- Six credit hours of electives

During each residency year Master's students must register for and attend both semesters of the colloquium series (PSYO 8011.03) and are required to do some teaching in the undergraduate program. The amount of teaching is presently the equivalent of no more than 10 hours/week for one term. This consists of working as a laboratory instructor, seminar leader, or teaching assistant. Some students elect to take PSYO 7100.03 : Seminar in Teaching Effectiveness at the MSc level. Taking this class does not count towards the required six credit hours of electives. Master's students must also register for PSYO 9000.00 (Thesis).

### ***Doctor of Philosophy (PhD) in Psychology and Neuroscience (Experimental stream)***

Students are expected to conduct research leading to empirical, methodological and/or theoretical advances in their field of study, some, or all of which will be included in their dissertation and defended publicly. In addition to the dissertation (PSYO 9530.00),



which is the major requirement of this program, students in the PhD program must complete the following courses (unless they were completed as part of the Master's program):

- PSYO 6001.03: Fundamentals of Statistics and Experimental Design, and three additional credit hours in the quantitative/analytic area
- PSYO 7100.03: Seminar in Teaching Effectiveness
- PSYO 7501.03: Proseminar: Methods of Psychological Inquiry I
- PSYO 7502.03: Proseminar: Methods of Psychological Inquiry II
- Six additional credit hours of electives (with approval, this may be taken outside the department) in addition to any that were completed as part of the Master's program.

During each year in the PhD program students are required to register for Dissertation Research (PSYO 9530.00) and are encouraged to enroll in graduate seminars. During each residency year students must register for and attend both semesters of the colloquium series (PSYO 8012.03 first year and PSYO 8013.03 second year) and do some teaching in the undergraduate program (see Master's program description). At least one year before submission of the dissertation students must also satisfy the comprehensive examination requirement. This requirement entails completing up to three comprehensive 'projects'.

Students who are entering the PhD as direct admissions without a Masters are required to complete 3 comprehensive exams (i.e., an ATC exam + 2 comprehensive projects). A student who enters the PhD with a previous Masters may have this reduced to 2 comprehensive projects with approval of their supervising committee and graduate coordinator.

## Psychology and Neuroscience (Neuroscience Stream)

The graduate program in Psychology and Neuroscience is also designed as an "apprenticeship" program in which students work closely with a Psychology and Neuroscience faculty member who has agreed to supervise their research. Emphasis is placed on interdisciplinary research, scholarship and independent thinking rather than on course work.

### ***Master of Science (MSc) in Psychology and Neuroscience (Neuroscience stream)***

In addition to the Master's thesis (PSYO 9000.00), which is the major requirement of this program, the Master's student must complete the following courses:

- NESC 6101.03 and NESC 6102.03: Principles of Neuroscience
- PSYO 7501.03: Proseminar: Methods of Psychological Inquiry I
- PSYO 7502.03: Proseminar: Methods of Psychological Inquiry II
- Three credit hours of course work in the quantitative/analytical area

During each residency year Master's students must register for and attend both semesters of the colloquium series (PSYO 8011.03) and are required to do some teaching in the undergraduate program. The amount of teaching is presently the equivalent of no more than 10 hours/week for one term. This consists of working as a laboratory instructor, seminar leader, or teaching assistant. Some students elect to take PSYO 7100.03 : Seminar in Teaching Effectiveness at the MSc level. Taking this class does not count towards the three credit hours of electives. Master's students must also register for PSYO 9000.00 (Thesis).

### ***Doctor of Philosophy (PhD) in Psychology and Neuroscience (Neuroscience stream)***

Students are expected to conduct research leading to empirical, methodological and/or theoretical advances in their field of study, some or all of which will be included in their dissertation and defended publicly. In addition to the dissertation (PSYO 9530.00), which is the major requirement of this program, students in the PhD program must complete the following courses (unless they were completed as part of the Master's program):

- NESC 6101.03 and NESC 6102.03: Principles of Neuroscience
- PSYO 7100.03: Seminar in Teaching Effectiveness
- PSYO 7501.03: Proseminar: Methods of Psychological Inquiry I
- PSYO 7502.03: Proseminar: Methods of Psychological Inquiry II

During each year in the PhD program students are required to register for Dissertation Research (PSYO 9530.00) and are encouraged to enroll in graduate Neuroscience and/or Psychology seminars. During each residency year students must register for and attend both semesters of the colloquium series (PSYO 8012.03 first year and PSYO 8013.03 second year) and do some teaching in the

undergraduate program (see Master's program description). At least one year before submission of their dissertation students must also satisfy the comprehensive examination requirement. This requirement entails completing up to three comprehensive 'projects'.

Students who are entering the PhD as direct admissions without a Masters are required to complete 3 comprehensive exams (i.e. an ATC exam + 2 comprehensive projects). A student who enters the PhD with a previous Masters may have this reduced to 2 comprehensive projects with approval of their supervising committee and graduate coordinator.

## Doctor of Philosophy (PhD) in Clinical Psychology

Clinical Psychology at Dalhousie is a fast-track program in which students accelerate from the MSc to the Clinical PhD program without writing a Master's thesis or obtaining a Master's degree. Candidates for the Clinical Psychology program must have an Honours degree or equivalent in Psychology. Students accepted to study Clinical Psychology are initially registered in an MSc program and then fast-tracked to the Clinical PhD program before the end of their first year. Students accepted into the Clinical program with a Master's degree in Psychology (or a closely related field) are eligible for direct entry to the PhD and may be eligible for advanced standing within the program. Note that fast-tracking into the Clinical PhD requires that a student has been admitted to study Clinical Psychology.

The PhD program in Clinical Psychology is a CPA accredited, structured, five-year program which follows the "scientist-practitioner" model. It considers clinical psychology as part of the science of psychology and therefore emphasizes research.

Upon admission, students are assigned to a faculty member who will supervise their thesis and other research projects. During the first four years of the Clinical PhD program, students complete required and elective courses, conduct supervised and thesis research, and gain clinical experience through field placements (PSYO 8333X/Y.06, a minimum of 600 hours are required). Students are involved in research from the outset, and are expected to conduct research leading to empirical, methodological and/or theoretical advances in their field of study, some, or all of which will be included in their dissertation and defended publicly. In the fifth year, students complete a full-year clinical internship (PSYO 9100.00). The Department does not offer a Master's degree in Clinical Psychology.

The following courses are required:

- PSYO 5000.06: Research Assignment (= Comprehensive No. 1)
- PSYO 6001.03: Fundamentals of Statistics and Experimental Design
- PSYO 6003.03: Multivariate Methods
- PSYO 6102.03: Child Assessment: Historical and Contemporary Perspectives and Practical Applications
- PSYO 6103.03: Adult Assessment: Historical and Contemporary Perspectives and Practical Applications
- PSYO 6104.03: Psychopathology: A Lifespan Perspective
- PSYO 6105.03: Ethics and Professional Decision Making
- PSYO 6106.03: Foundational Practice Skills for Clinical Psychology
- PSYO 6107.03: Mental Health and Psychoeducational Assessment Practicum: Child
- PSYO 6108.03: Mental Health and Psychoeducational Assessment Practicum: Adult
- PSYO 6204.03: Cognitive, Affective and Behavioural Bases of Intervention: A Lifespan Perspective
- PSYO 6208.03: Advanced Clinical Neuropsychology **OR** PSYO 6804.03: Topics in Neuropsychology
- PSYO 6209.03: Research Seminar
- PSYO 6213.03: Culture and Identity: Diversity Issues in Clinical Psychology
- PSYO 6214.03: Professional Practice in Intervention
- PSYO 6301.03: Advanced Clinical Intervention: Child **OR** PSYO 6302.03: Advanced Clinical Intervention: Adult
- PSYO 6303.03: Advanced Clinical Practice Skills in Supervision, Consultation and Program Evaluation
- PSYO 6304X/Y.06: Clinical Rounds/Case Conference
- PSYO 7100.03: Seminar in Teaching Effectiveness
- PSYO 7501.03: Proseminar: Methods of Psychological Inquiry I
- PSYO 7502.03: Proseminar: Methods of Psychological Inquiry II
- PSYO 8011.03: Psychology Colloquium MSC (whole year)
- PSYO 8012.03: Psychology Colloquium first year of PhD I (whole year)
- PSYO 8013.03: Psychology Colloquium second year of PhD II (whole year)
- PSYO 8333X/Y.06: Field Placements
- PSYO 9100.00: Pre-doctoral Internship

- At least three credit hours of elective seminars must also be completed.

# Graduate Certificates in Translational NeuroTechnology (TNT)

Contact: Aaron Newman, Dalhousie University ([Aaron.Newman@dal.ca](mailto:Aaron.Newman@dal.ca))

## Certificate Descriptions

The certificates in Translational NeuroTechnology (TNT1 and TNT2) are designed to provide both a scientific grounding in neurotechnology and clinical neuroscience, and the professional skills needed to work in translating scientific knowledge into products that benefit people. These include skills in the process of innovation, intellectual property, business, and communication. Graduates will be suited to jobs in industrial and academic settings, designing solutions that meet real needs and commercializing or otherwise mobilizing these innovations.

There are two graduate certificates in Translational NeuroTechnology: TNT1 and TNT2. These are designed to be completed sequentially, although some components of the TNT2 certificate may be completed prior to the awarding of the TNT1 certificate. Normally, it is expected that students will complete the TNT1 certificate during their Master's degree, and the TNT2 certificate during their PhD degree; other scenarios are possible, however.

The TNT certificates are open to any student enrolled in a graduate program at Dalhousie University. Students should consult with their graduate program coordinator and the certificate coordinator to determine how best to accommodate the certificate requirements with those of their graduate program.

## TNT1 Certificate Requirements

The Graduate Certificate in Translational NeuroTechnology (TNT1) will be awarded at graduation, upon successful completion of the following:

- [PSYO 7701.03](#): RADIANT Seminar
- [PSYO 7705.06](#): Summer Institute — Neurotechnology Innovation, Commercialization, and Entrepreneurship
- A thesis or other research project in the domain of neurotechnology.  
This research project may fulfill a requirement of the student's degree program (e.g., thesis or comprehensive research project) as well as the requirement of the Certificate. This project must be approved by the certificate coordinator.

## TNT2 Certificate Requirements

The Graduate Certificate in Advanced Translational NeuroTechnology (TNT2) will be awarded at graduation, upon completion of the following:

- [PSYO 7711.03](#): Innovating Neurotechnology I
- [PSYO 7712.03](#): Innovating Neurotechnology II
- [PSYO 7790.06](#): Internship in Neurotechnology
- A thesis or other research project in the domain of neurotechnology.  
This research project may fulfill a requirement of the student's degree program (e.g., thesis or comprehensive research project) as well as the requirement of the Certificate. This project must be approved by the certificate coordinator. The same project may not be used to fulfill the requirements of TNT1 and TNT2.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

# Course Notes

Required courses in Psychology are offered on a regular basis and are restricted to students enrolled in a graduate program in Psychology. Those courses required for the Clinical Psychology Program are restricted to those students enrolled in that program. Director of Clinical Training and Instructor approval is required for non-Clinical Psychology graduate students to register for Clinical courses. Other courses are offered, and seminar topics chosen, on the basis of faculty interests and student needs.

## Course Descriptions

### **NESC 5070 Chemical Neurobiology**

CREDIT HOURS: 3

Please see course description for MNSC 5070.03 in the Medical Neuroscience section of this calendar.

CROSSLISTED: NESC 4070.03, PHYL 5494.03

### **NESC 5603 Neuropharmacology of Pain**

CREDIT HOURS: 3

CROSSLISTED: PHAC 5603.03

### **NESC 5605 Role of the Brain's Immune/ Inflammatory System in Disease**

CREDIT HOURS: 3

CROSSLISTED: PHAC 5605.03

### **NESC 5619 The Autonomic Nervous System and its Pharmacology**

CREDIT HOURS: 3

CROSSLISTED: PHAC 5619.03

### **NESC 6071 Topics in Behavioural Neuroscience**

CREDIT HOURS: 3

This seminar course covers contemporary, fundamental topics in physiological psychology, including methods, research and/or theory. Various topics such as brain mechanisms of reinforcement, hormones and behaviour, and biological rhythms, will be covered in different years.

PREREQUISITES: PSYO or NESC graduate student

CROSSLISTED: PSYO 6071.03

FORMATS: Seminar

### **NESC 6101 Principles of Neuroscience: Cellular and Molecular Neuroscience**

CREDIT HOURS: 3

Neuroscience 6101.03 and 6102.03 are Neuroscience 6100X/Y.06 divided into terms A and B for suitable incorporation into non-Neuroscience programs. NESC 6101 will focus on cellular and molecular neurobiology and will cover topics such as membrane potentials, synaptic transmission, second messengers, trophic factors, cell differentiation and neurodegeneration. Evaluation will be based on quizzes, several oral presentations prepared throughout the year, and grant proposals.

### **NESC 6102 Principles of Neuroscience: Systems and Behavioral Neuroscience**

CREDIT HOURS: 3

Neuroscience 6101.03 and 6102.03 are Neuroscience 6100X/Y.06 divided into terms A and B for suitable incorporation into non-Neuroscience programs. NESC 6102 will focus on systems and behavioural neurobiology and will cover topics such as visual and somatosensory systems, motor program generation, autonomic and neuroendocrine functions, motivation, learning, circadian rhythms and sleep/wake cycles and cognitive neuroscience. Evaluation will be

based on quizzes, several oral presentations prepared throughout the year, and grant proposals.

### **NESC 6670 Behavioural (Neuro)epigenetics**

CREDIT HOURS: 3

In this seminar course we discuss primary scientific literature on significant advances in (epi)genetic, cellular and behavioural approaches in molecular and systems neuroscience to examine social, emotional and cognitive abilities and further understand the roles of molecular and cellular pathways and environmental factors that underlie the neuropathology of neurodegenerative diseases (e.g., Parkinson's, Alzheimer's, and Huntington's), learning and attention disabilities (e.g., Autism, ADHD), addiction (e.g., alcoholism, drug abuse) and major psychosis (bipolar disorder, schizophrenia, major depression). The role of genetic and epigenetic mechanisms as well as methods used to study gene-environment interactions are examined.

FORMATS: Lecture | Seminar

### **PSYO 5000 Research Assignment**

CREDIT HOURS: 6

Students become actively involved in ongoing research in the laboratory of a faculty supervisor. In addition to research training, this course aims to improve the student's oral presentations and scientific writing. A final report (e.g., in the form of a Journal article) is required.

CALENDAR NOTES: Credit can be given for this course only when the committee agrees the student has completed the requirements -- students must register in this course until final grade is provided.

### **PSYO 5001 Independent Study**

CREDIT HOURS: 3

NOTE: Course Details listed here also apply to PSYO 5002.

### **PSYO 5002 Independent Study**

CREDIT HOURS: 3

See PSYO 5001.

### **PSYO 5003 Directed Reading/Independent Study PhD1**

CREDIT HOURS: 3

Students work closely with a faculty supervisor on a topic of mutual interest. Study may focus on laboratory research or library research and empirical, methodological, theoretical and/or professional issues may be covered. A final report is required.

### **PSYO 5004 Directed Reading/Independent Study PhD2**

CREDIT HOURS: 3

Students work closely with a faculty supervisor on a topic of mutual interest. Study may focus on laboratory research or library research and empirical, methodological, theoretical and/or professional issues may be covered. A final report is required.

### **PSYO 6001 Fundamentals of Statistics and Experimental Design**

CREDIT HOURS: 3

This course will survey some common parametric statistical procedures in psychology, including analysis of variance and covariance. Major emphasis is placed on the general linear model and how best to apply the model as a function of the type of data, experimental design, and hypotheses under investigation. Some knowledge of basic statistics is assumed.

### **PSYO 6003 Multivariate Methods**

CREDIT HOURS: 3

This course will cover a variety of topics in multivariate statistics, such as factor analysis, regression, multivariate analysis of variance and covariance, and discriminant function analysis. Some topics in categorical data analysis may also be covered, such as multiway frequency analysis and logic models.

### **PSYO 6051 Neural Basis of Perception**

CREDIT HOURS: 3

This seminar course explores the correlations between 1) stimulus properties and neural responses produced by sensory stimulation and 2) the neural coding of environmental events and the behaviours that may be produced in the context of these events. These correlations will be studied within the auditory, visual, and tactile modalities.

FORMATS: Seminar

### **PSYO 6060 Biological Basis of Mental Illness**

CREDIT HOURS: 3

This seminar course explores our current understanding of the physiological mechanisms that may underlie various forms of abnormal behaviour. Its subject matter includes disorders for which a physiological mechanism has been identified as well as those for which a physiological basis is currently a matter for speculation. This course is intended for graduate students with backgrounds in some aspects of neuroscience and clinical psychology.

FORMATS: Seminar

### **PSYO 6071 Topics in Behavioural Neuroscience**

CREDIT HOURS: 3

This seminar course covers contemporary, fundamental topics in physiological psychology, including methods, research and/or theory. Various topics such as brain mechanisms of reinforcement, hormones and behaviour, and biological rhythms, will be covered in different years.

CROSSLISTED: NESC 6071.03

FORMATS: Seminar

### **PSYO 6081 Topics in Personality and Social Psychology**

CREDIT HOURS: 3

Different topics in personality and social psychology (such as psychology of persons, attitude formation, group dynamics) are covered in a seminar format.

FORMATS: Seminar

### **PSYO 6091 Topics in Child Development**

CREDIT HOURS: 3

Different topics in child development (such as language acquisition, social development, meta-cognitive processes) are covered in a seminar format.

EXCLUSIONS: PSYO 4091

FORMATS: Seminar

### **PSYO 6101 Computers and Instrumentation in Psychology Experiments**

CREDIT HOURS: 3

This course provides an overview of the use of computers in psychological experimentation. Topics may include: real-time issues, input and display devices, platform and operating system differences, web-based experiments, and current experimental packages. Course work will include an introduction to programming and the development of a small-scale computerized experiment.

FORMATS: Seminar

### **PSYO 6102 Child Assessment: Historical and Contemporary Perspectives and Practical Applications**

CREDIT HOURS: 3

This course addresses the theoretical and applied foundations of psychological measurement as it relates to child assessment. Historical, theoretical, and psychometric issues are addressed to provide the students with a sound knowledge base in issues related to test development. The second part of the course emphasizes the development of skills in assessment of cognitive abilities, personality, behaviour, and emotional function of children. Students learn to administer, score, and interpret performance on a variety of assessment instruments for children. Report writing skills are developed through case studies.

FORMATS: Seminar

### **PSYO 6103 Adult Assessment: Historical and Contemporary Perspectives and Practical Applications**

CREDIT HOURS: 3

This course addresses the theoretical and applied foundations of psychological measurement as it relates to adult assessment. Historical, theoretical, and

psychometric issues are addressed to provide the students with a sound knowledge base in issues related to test development, including various forms of validity and reliability, as well as research designs in test development. The second part of the course emphasizes the development of skills in the assessment of cognitive abilities, personality, behaviour, and emotional functioning of adults. Students learn to administer, score, and interpret performance on a variety of assessment instruments for adults. Report writing skills as developed through case studies.

EXCLUSIONS: PSYO 6203.03

FORMATS: Seminar

### **PSYO 6104 Psychopathology: A Lifespan Perspective**

CREDIT HOURS: 3

This course is an overview of psychopathology from a lifespan perspective. The objective is to provide knowledge of diagnostic criteria, and evidence on etiology and treatment of the major mental health disorders. Historical, social, cultural, and contextual aspects of psychopathology are examined and current research in the field is highlighted.

FORMATS: Seminar

### **PSYO 6105 Ethics and Professional Decision Making**

CREDIT HOURS: 3

This course covers ethical and professional issues arising in various fields of psychology, including clinical practice and research. Students will be encouraged to develop a methodology for appraising their ethical and professional behaviour through an understanding of such issues as the legal regulation of psychology, codes of ethics and professional standards, and malpractice. The course will introduce students to the concepts of quality and risk and explore the relationship between psychology and other professions in multi-disciplinary contexts. The course will also examine the relation between psychology standards and standards established by organizations in which psychologists work, such as health facility accreditation.

FORMATS: Seminar

### **PSYO 6106 Foundational Practice Skills for Clinical Psychology**

CREDIT HOURS: 3

This course provides an introduction to foundational clinical skills necessary for intervention and assessment practice with clients. Students will learn clinical interviewing techniques and their application with clients across the lifespan. Students will learn how to select techniques and structure interviews to meet specific assessment and intervention goals, keeping with the referral question and the client's developmental status. Students will also become familiar with professional standards of practice, core competencies, and key ethical issues related to clinical practice as a preparation for practicum training.

CALENDAR NOTES: Replaces PSYO 6203. New title accurately reflects content and is in line with the Canadian Psychological Association (CPA) accreditation standards.

EXCLUSIONS: PSYO 6203.03

FORMATS: Seminar

### **PSYO 6107 Mental Health and Psychoeducational Assessment Practicum: Child**

CREDIT HOURS: 3

This course will provide students with the opportunity to gain applied experience in conducting psychoeducational and mental health assessments with children. Students will be able to apply the skills learned in PSYO 6102 Child Assessment. Students will attend class as well as practicum to complete one to two psychological assessments. Students will receive course credit for taking PSYO 6107 as well as accumulate practicum hours to a maximum of 80 hours.

PREREQUISITES: PSYO 6102.03 and PSYO 6103.03

### **PSYO 6108 Mental Health and Psychoeducational Assessment Practicum: Adult**

CREDIT HOURS: 3

This class will provide students with the opportunity to gain applied experience in conducting psychoeducational and mental health assessments with adults. Students will be able to apply the skills learned in PSYO 6103 Adult Assessment. Students will attend class as well as practicum to complete one to two psychological assessments. Students will receive course credit for taking PSYO 6108 as well as accumulate practicum hours to a maximum of 80 hours.

PREREQUISITES: PSYO 6102.03 and PSYO 6103.03

FORMATS: Seminar | Other (explain in comments)

### **PSYO 6160 Comparative Psychology**

CREDIT HOURS: 3

Different topics in comparative psychology (such as kin selection, parental behaviour, hormonal control of behaviour, olfaction, and behaviour) are covered.

FORMATS: Seminar

### **PSYO 6204 Cognitive, Affective and Behavioural Bases of Intervention: A Lifespan Perspective**

CREDIT HOURS: 3

This course is an overview of major courses and modes of psychotherapy from a lifespan perspective. The objective is to provide knowledge of the history, development, current research findings, and practical considerations for implementing psychological interventions. Skills and knowledge for evaluating research evidence for specific treatments will be highlighted.

PREREQUISITES: PSYO 6104.03

FORMATS: Seminar

### **PSYO 6208 Advanced Clinical Neuropsychology**

CREDIT HOURS: 3

This course emphasizes the development of a knowledge base and applied skills in clinical neuropsychology. Topics include functional neuroanatomy, neurological exam, neuroimaging, process of neuropsychological assessment and differential diagnosis, and introduction to common neurological disorders. The course will involve a combination of instructor- and student-led lectures and discussions, guided readings, observation of clinical cases, and hands-on practice.

FORMATS: Seminar

### **PSYO 6209 Research Seminar**

CREDIT HOURS: 3

This course focuses on theoretical and substantive aspects of research design. Topics include reliability and validity of measurement, correlational, quasi-experimental, and experimental designs, measurement redundancy, and power analysis. Students present on selected topics, as well as present on design issues related to their dissertation.

FORMATS: Seminar

### **PSYO 6213 Culture and Identity: Diversity Issues in Clinical Psychology**

CREDIT HOURS: 3

This course is an introduction to the interrelated concepts of culture and identity as they intersect in clinical psychology. It is intended to promote an appreciation of the impact of diverse and cultural influences on who we understand ourselves and others to be. This class will serve as an initial step towards developing cultural competence

FORMATS: Seminar

### **PSYO 6214 Professional Practice in Intervention**

CREDIT HOURS: 3

This class will provide students with the opportunity to gain applied experience in conducting psychological interventions. Students will be able to apply the skills learned in PSYO 6204 Intervention Lifespan. Students will attend class as well as practicum to complete intervention with one client or group. Students will receive course credit for taking PSYO 6214 as well as accumulate practicum hours to a maximum of 80 hours.

PREREQUISITES: PSYO 6102.03, PSYO 6103.03, PSYO 6107.03 and PSYO 6108.03

FORMATS: Other (explain in comments)

### **PSYO 6240 Topics in Animal Learning**

CREDIT HOURS: 3

Different topics in the field of animal learning (such as classical and operant conditioning, quasi-neural modeling of learning phenomena, etc.) are covered.

FORMATS: Seminar

### **PSYO 6301 Advanced Clinical Intervention: Child**

CREDIT HOURS: 3

This class focuses on a wide range of theoretical and applied aspects of child intervention. The class involves instruction in case conceptualization, treatment planning, and treatment evaluation.



### **PSYO 6302 Advanced Clinical Intervention: Adult**

CREDIT HOURS: 3

This course is the adult equivalent of 6301.03. The emphasis is on Adult Advanced Clinical Intervention.

FORMATS: Seminar

### **PSYO 6303 Advanced Clinical Practice Skills in Supervision, Consultation & Program Evaluation**

CREDIT HOURS: 3

Clinical supervision, consultation, and program development and evaluation constitute three critically important skill areas for clinical psychologists. This course will provide students with hands-on experience in supervision as well as theoretical and practical knowledge in consultation and program development and evaluation.

EXCLUSIONS: PSYO 6401.03

FORMATS: Seminar

### **PSYO 6304 Clinical Rounds/Case Conference**

CREDIT HOURS: 6

All students are expected to attend clinical rounds and presentations in various clinical settings in the community. Students are also expected to attend clinical case conferences that will be held on a monthly basis through the Fall and Winter terms. Clinical psychologists from the community and senior students are invited to present cases from their clinical practice. The aim of this course is to familiarize students with different ways of conceptualizing psychological problems, planning and initiating interventions, and evaluating outcome. Evaluation is based on student attendance and participation.

CALENDAR NOTES: Credit can only be given for this course if Fall and Winter are completed in consecutive terms and partial credit cannot be given for a single term.

### **PSYO 6313 Topics in Cognitive Psychology**

CREDIT HOURS: 3

Varied topics in cognitive psychology (such as theories of attention, memory and amnesia, cognitive inhibition) are covered in a seminar format.

FORMATS: Seminar

### **PSYO 6581 History of Psychology I**

CREDIT HOURS: 3

Drawing on writings from antiquity to the early years of the 20th century, we explore the nature of historical explanation, explanation in science, knowledge and truth, life, human nature, the domains of animal and man, neuroscience, and personality.

PREREQUISITES: To be enrolled in a Graduate Program

FORMATS: Lecture | Seminar

### **PSYO 6582 History of Psychology II**

CREDIT HOURS: 3

Drawing on writings from antiquity to the early years of the 20th century, we explore the nature of learning, thinking, memory, intelligence, mental illness and treatment, the unconscious, dreams, development, and the self.

PREREQUISITES: To be enrolled in a Graduate Program

FORMATS: Lecture | Seminar

### **PSYO 6803 Topics in Psychopathology**

CREDIT HOURS: 3

Topics in psychopathology, which may vary from year to year, include: anxiety, child psychopathology, drug abuse, schizophrenia.

FORMATS: Seminar

### **PSYO 6804 Topics in Neuropsychology**

CREDIT HOURS: 3

These seminars will vary from term to term and will focus on brain-behaviour relationships. Topics may include: neuropsychological assessment, functional neuroanatomy, neurological, psychiatric and medical neuropsychology, cognitive rehabilitation, psychopharmacology, and other related topics.

EXCLUSIONS: PSYO 4227.03: Neuro Basis of Psychopathology

FORMATS: Seminar

### **PSYO 6805 Topics in Assessments**

CREDIT HOURS: 3

Different topics in assessment are covered.

FORMATS: Seminar

### **PSYO 6806 Topics in Psychopharmacology**

CREDIT HOURS: 3

This seminar course examines the neural and behavioural effects of drugs. The agonist and antagonist actions of drugs on receptors for neurotransmitters and the effects of drugs on neurotransmitter synthesis, storage, release, and deactivation are covered. Aimed specifically at psychologists, the course focuses on the use of drugs to treat clinical disorders such as depression, schizophrenia, Alzheimer's disease, etc.

FORMATS: Seminar

### **PSYO 6807 Topics in Forensic Psychology**

CREDIT HOURS: 3

Forensic Psychology deals with the applications of psychological principles and methods to various aspects of the criminal justice system (i.e., the courts, corrections, policing). Coverage of this broad topic will vary from a general overview of the field to specific topics of interest to the students. Whatever the topic, professional and ethical issues will be addressed and the complexities of conducting research on psycho-legal issues will be explored.

FORMATS: Seminar

### **PSYO 6808 Topics in Therapeutic Intervention**

CREDIT HOURS: 3

This seminar course will focus on specific types of intervention. Topics, which may vary from year to year, may include: crisis intervention, feminist therapy, operant interventions, family therapy, marital therapy, sex therapy, cognitive behaviour therapy, individual psychotherapy, pharmacotherapy, etc.

FORMATS: Seminar

### **PSYO 6809 Topics in Health Psychology**

CREDIT HOURS: 3

This seminar course will examine specific topics concerning the inter-relationship between physical health and psychology. Topics, which may vary from year to year, may include: pediatric psychology, pain, health in the aged, health promotion, cardiovascular disease, etc.

FORMATS: Seminar

### **PSYO 6820 Topics in Community Psychology**

CREDIT HOURS: 3

The focus of this seminar will be on the delivery of psychological services in community settings. The topics will vary from year to year depending on the needs of the course and the expertise of the instructor.

FORMATS: Seminar

### **PSYO 7100 Seminar in Teaching Effectiveness**

CREDIT HOURS: 3

Students currently engaged as Teaching Assistants in PSYO 2000.03 and NESC 2007.03 must concurrently enroll in this course, which has two components:

1) a weekly meeting in which all students meet to discuss general and specific issues related to course planning, assessment of student performance and dealing with problems; 2) actual teaching experience in course for 2 hours/week. Teaching performance is intermittently observed, and feedback provided on an individual basis.

### **PSYO 7501 Proseminar: Methods of Psychological Inquiry I**

CREDIT HOURS: 3

New students are exposed to a broad range of topics in Psychology and Neuroscience as well as a sampling of methodologies used to study human and

animal behaviour and its neural underpinnings. The course may also aim to develop the student's communication skills and research ability.

RESTRICTIONS: For Clinical Psychology and Psychology & Neuroscience Graduate Students only

FORMATS: Seminar

### **PSYO 7502 Proseminar: Methods of Psychological Inquiry II**

CREDIT HOURS: 3

New students are exposed to a broad range of topics in Psychology and Neuroscience as well as a sampling of methodologies used to study human and animal behaviour and its neural underpinnings. The course may also aim to develop the student's communication skills and research ability.

CALENDAR NOTES: Restricted to Graduate Students in Clinical Psychology and Psychology & Neuroscience

RESTRICTIONS: Restricted to Graduate Students in Clinical Psychology and Psychology & Neuroscience

FORMATS: Seminar

### **PSYO 7701 Rehabilitative and Diagnostic Innovation in Applied Neurotechnologies (RADIANT) Seminar**

CREDIT HOURS: 3

Seminar in commercialization and other translational activities for neuroscience and neurotechnology. Topics include: neurotechnology research and methods; clinical neuroscience; commercialization and intellectual property; ethics: research, clinical, and professional ethics, implications of neurotechnology on society; written and oral communication skills suitable to scientific and lay audiences.

PREREQUISITES: Instructor's approval

FORMATS: Seminar

### **PSYO 7705 Neurotechnology Innovation, Commercialization, and Entrepreneurship**

CREDIT HOURS: 6

Intensive three-week course in neurotechnology, clinical neuroscience, and commercialization. Topics include: neuroimaging methods; diagnosis, assessment, and treatment of nervous system-related disorders; the process of innovation; and business fundamentals. Features guest lectures by successful scientists and entrepreneurs, as well as hands-on workshops and lab exercises on business and neurotechnology topics.

PREREQUISITES: Instructor's approval

FORMATS: Seminar

### **PSYO 7711 Innovating Neurotechnology I**

CREDIT HOURS: 3

Provides an overview of the process of innovation and commercialization of neurotechnologies and related technologies. Topics include: needs finding, needs screening, and product development; project, time, and personnel management; and communication to scientific, clinical and lay audiences.

PREREQUISITES: Instructor's approval

FORMATS: Seminar

### **PSYO 7712 Innovating Neurotechnology II**

CREDIT HOURS: 3

Provides an overview of the process of innovation and commercialization of neurotechnologies and related technologies. Topics include: product development; project, time, and personnel management; finance; capital-raising; intellectual property; marketing; and communication to scientific, clinical and lay audiences.

PREREQUISITES: Instructor's approval

FORMATS: Seminar

### **PSYO 7790 Internship in Neurotechnology**

CREDIT HOURS: 6

A minimum 4-month internship in an industrial or other setting (e.g., life sciences industry organization; not-for-profit/NGO; etc.). This course will provide exposure to research and development in a non-academic environment, along with other aspects such as business strategy, organizational structure, management, sales, marketing, and finance.

PREREQUISITES: Instructor's approval

### **PSYO 8011 Psychology & Neuroscience Colloquium Masters**

CREDIT HOURS: 3

Students are required to go to the Colloquium Series

### **PSYO 8012 Psychology & Neuroscience Colloquium Series PhD year 1**

CREDIT HOURS: 3

Students are required to attend the Colloquium series

### **PSYO 8013 Psychology & Neuroscience Colloquium Series PhD year 2**

CREDIT HOURS: 3

Students must attend the Colloquium Series.

### **PSYO 8333 Field Placements**

CREDIT HOURS: 6

Students are assigned to field placements in co-operating institutions where the student will spend one day per week (or equivalent). Placements are individually arranged to provide the student with experience in a variety of clinical environments. Field placements are coordinated and monitored by the Field Placement Coordinator. Students must complete a minimum of 600 practicum hours before they can register for the predoctoral internship (see Practicum Guidelines).

CALENDAR NOTES: Credit can be given for this course only when the student has completed the course requirements -- students must register in this course until final grade is provided.

### **PSYO 9000 MSc Thesis**

CREDIT HOURS: 0

### **PSYO 9100 Pre-Doctoral Internship**

CREDIT HOURS: 0

A 12-month, full-time internship in an approved setting is required. Typically, the internship setting will be accredited by the Canadian Psychological Association or the American Psychological Association.

### **PSYO 9530 PhD Thesis**

CREDIT HOURS: 0

## **Public Administration**

Location:

Kenneth C. Rowe Building

6100 University Avenue

3rd Floor

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3742

Fax Number: (902) 494-7023

Email Address: [DalMPA@dal.ca](mailto:DalMPA@dal.ca)

Website: [www.dal.ca/mpa](http://www.dal.ca/mpa)

# Staff

## Director of School

Turnbull, L.

## Program Manager

Cullymore, K.

## Professors Emeriti

**Brown, P.**, BA (Mt. A), MA (Dalhousie), PhD (Toronto)

**McNiven, J. D.**, BA, MA, PhD (Mich)

**Pross, A. P.**, BA, MA (Queen's), PhD (Toronto)

**Traves, T.**, BA (Man), MA, PhD (York), President Emeritus, Dalhousie University, jointly with History

## Professors

**Charlebois, S.**, BComm (Royal Military College), MBA (UQAM); DBA (Sherbrooke) Food distribution, Food policy, Food safety, Food security and Traceability

**Quigley, K.**, BA (Queen's), MSc (London School of Economics and Political Science, London, UK), PhD (Queen's Univ, Belfast, UK).

Comparative public sector risk and crisis management, strategic management, and critical infrastructure protection

**Roy, J.**, BA (Waterloo), MBA (Ottawa), PhD (Carleton). Digital and open government, public service innovation, multi-stakeholder collaboration, democratic engagement, and national security governance.

## Associate Professors

**Mechoulan, S.**, Diplôme HEC (Paris, France), MA (Paris Jourdan Sciences Economiques), PhD (Northwestern). Law and Economics, Family Economics, Health Economics, Public Policy

**Turnbull, L.**, BA (Acadia), MA, PhD (Dalhousie). Canadian parliamentary governance, Political ethics, Elections, Electoral systems, Public engagement

**Wranik, D.**, BA, MA, PhD (Manitoba). Health Economics, Health System Efficiency, Physician Remuneration Models, Health Service Delivery Models, Health Technologies Assessment, and its use in policy making, Health Policy Design and Evaluation

## Assistant Professors

**Caron, I.**, BA (Laval), MA, PhD (Ottawa). Diversity, intersectionality, communications, control, performance, accountability, and integrity in the public sector and public policy

**Pictou, S.**, BA (St. Mary's), BEd (Mt. Allison), MA (Dalhousie), PhD (Dalhousie). Mikmaw & Indigenous Land and Water-Based Governance, Indigenous Food Systems, Indigenous Women's Political Life, Rights and Activism, Treaty Relations and Rights, Mi'kmaw & Indigenous Land-Based Learning Practices, Decolonization & Resurgence, Multi-scalar Indigenous Peoples' Movements, Indigenous & Small-scale Fisheries Movements

## Instructors

**Baechler, J.**, BSc, MA, PhD (Dalhousie). Public administration/management, peace/conflict studies, international development studies and complexity theory – exploring opportunities for and barriers to multi-actor, cross-boundary collaboration in the context of international security and development efforts

**Sharaput, M.**, BA (York), MA (Carleton), PhD (Carleton). Regional and community development, organizational innovation, governance.

## Adjunct (FGS)

**Durier-Copp, M.**, BA, MA, PhD (McGill)

**Filbee, S.**, BA (Acadia), MBA (Dalhousie), PhD (Hertfordshire)

**Fullerton, R.**, BSc (Dalhousie), MED (Toronto), PhD (Union Institute)

**Haworth, R.**, BSc (Durham), PhD (Cambridge)

**Hennebury, B.**, BComm (St. Mary's), MPA (Dalhousie)

**Moody, R.**, BComm (St. Mary's), MPA (Dalhousie), PhD (Bradford)

**Siddiq, F.**, BA, MA (Dhaka), PhD (Dalhousie)

**Smith, B.**, BA (Montreal), Diplome Superiere d'Etudes Francaise (Nantes, France), MPA (Dalhousie)

**Stewart, J.**, BA, DPA, MPA (Dalhousie)

**Storring, T.**, BA (Hons) (Acadia), MPhil (Oxford)

### **Adjunct (Retired)**

**Cassin, M.**, BA (Man), MA (UBC), PhD (Toronto)

Students seeking further information or help in planning courses of study in the School of Public Administration should address themselves to:

Program Manager  
School of Public Administration  
6100 University Avenue  
PO Box 15000  
Halifax, NS B3H 4R2  
Telephone: (902) 494-3742  
Email: dalmpa@dal.ca

## **Degree Programs (General)**

The graduate programs of the school are designed to provide the professional education essential to a career in modern public service. They are offered to students who either are preparing for initial employment or are returning to university with work experience. The school is part of Dalhousie's Faculty of Management. This gives students the opportunity to explore links between public administration, business, the environment, and the information sciences.

The school offers six-degree programs in total, each designed for a different audience. These are the Master of Public Administration (MPA), the Master of Public Administration Management (MPAM), the Graduate Diploma in Public Administration (GDPA), the combined Master of Public Administration/Juris Doctor (MPA/JD), and the combined Master of Public Administration/Master of Information Management (MPA/MLIS).

The programs are professional in that they equip students with both an understanding of the organization, process, and activities of government and the administrative skills required in public sector management. Each component is essential, and consequently required of all students. They are expected to achieve an expanded awareness of the public interest and a personal appreciation of the ethical standards and comptroller principles appropriate to a career in the service of the public. The professional requirements have been developed in consultation with senior officials of all levels of government (including graduates of the school).

### **Master of Public Administration (MPA)**

The quantity and quality of work expected in individual courses will reflect the high scholarly standards of graduate education.

The MPA curriculum encompasses the essential components of financial, human resources and statistical techniques on the one hand, and economic, organizational and policy analysis on the other. Students in the first year of the MPA program are required to complete eight half credit courses in these core fields.

Students in the second year will develop their program from the offerings in the school and may elect to take up to three half credits from courses outside the school. Elective courses proposed from outside the school must be relevant to the field of Public Administration and approved by the Program Manager. These include courses from other academic units at Dalhousie or other universities provided they have sufficient public sector content.

In exceptional circumstances, students might qualify for completion of the MPA program in one year. The program, consisting of nine half credits of course work, may be considered for students who have completed, with a first-class standing, a BA honours degree in public administration. Admission to the one-year MPA may also be based on completion, with first-class standing, of an MA degree in these academic areas or a professional graduate-level degree in a field relevant to public administration (e.g., with public sector content). Course work in the honours degree and/or the masters program must have included at least four of the eight course credits required in the first year of the two-year MPA program.

A Dalhousie Bachelor of Management graduate with a cumulative GPA of 3.7 (A-) or higher over the four-year duration of the program might be accepted into the one-year MPA. The Program Manager of the MPA program shall determine the required courses the student must take to satisfy the requirements of the one-year MPA program consisting of nine half-credit courses.

## **Graduate Diploma in Public Administration (GDPA)**

The GDPA consists of 27 credit hours to be completed in the fall and winter semesters. These include six first year courses (18 credit hours) plus three additional elective course (9 credit hours) to be determined in consultation with the Program Manager.

## **JD/MPA**

The School of Public Administration and the Schulich School of Law offer a joint JD/MPA program. The program allows students to take the two degrees simultaneously and to complete them in four years, rather than in five years as is the case if each is taken independently. Students interested in entering the joint program should apply separately to both the School of Public Administration and the Schulich School of Law, indicating on their applications that they wish to enter the JD/MPA program. The closing date for applications for the JD is the end of February.

Students in the JD/MPA program will be eligible to take three PUAD elective courses and one elective outside the PUAD course offerings. PUAD 6000.03: Senior Seminar: Ethics, Public Service, and Governance is not a required course for JD/MPA students but may be taken as elective courses.

## **MPA/MLIS**

As the information-based economy continues to develop, it is clear that employees must be effectively equipped with technical and professional competencies to survive and prosper in public sector environments. In response to this need, the School of Public Administration and the School of Information Management are jointly offering the only dual, MLIS/MPA degree program. The joint program allows students to complete the two degrees simultaneously and to complete them in three years rather than in four years if each is taken independently. Students should apply separately to both the School of Public Administration and the School of Information Management.

## **Master of Public Administration (Management)**

The MPA (M) program is one of the finest examples of blended learning at the graduate level in Canada, combining distance learning with classroom instruction. This cutting-edge Master's degree is specifically designed for dedicated and goal-oriented mid-career public service professional who wish to pursue advanced management education on a part-time basis.

The MPA (M) consists of 39 credit hours; these include 27 core credit hours of the MPA (Management) program plus 12 additional elective credit hours to be determined in consultation with the Graduate Coordinator

The program focuses on core public administration disciplinary areas including human resource management, public policy, economics, accounting, and research methods. It also emphasizes people, relationships and organizational culture, and addresses transparency, ethics, accountability, integrity, leadership, and change.

Educational methods use interactive, web-facilitated instruction, classroom sessions and problem-based evaluation. The varied means of learning allow candidates to develop the skills and analytical ability necessary to successfully address current issues and priorities in the public sector.

Each course ends with a mandatory 2.5-day classroom session (Halifax and/or Central Canada). These sessions provide each student with individual attention from the instructor and the opportunity to share invaluable perspectives with fellow professionals from across the public sector and NGO.

Graduate Diploma in Public Administration (Management)

The GDPA(M) consists of 21 credit hours; these include 18 of the 24 core credit hours of the MPA (Management) program, plus three additional elective credit hours to be determined in consultation with the Graduate Coordinator.

Students seeking further information should contact the Centre for Advanced Management Education (CFAME), Faculty of Management, Dalhousie University at 1-800-205-7510 or (902) 494-6391 and ask for an application package or contact the CFAME Office by email at [cfame@dal.ca](mailto:cfame@dal.ca)

# Application and Admission Requirements

Application forms are available from the Admissions Office of Dalhousie University. Applications should be submitted as early as January and not later than June 1 in the academic year in which studies are to commence.

Admission decisions are made on a continuing basis from January until the program quota is reached.

Note: MPA (Management) accepts applications for fall, winter, and summer. Refer to MPA (Management) website for full admission criteria and deadlines.

## General Admission Requirement for MPA

Enrolment in the School is limited. Normally, competitive applicants will have attained a good second class standing (B+ (3.3 GPA) average) in their last 60 credit hours of university work.

Admission is based on an assessment of:

- Official transcripts from each institution attended;
- Two letters of reference;
- English Language Competency - English is the language of study at Dalhousie; therefore all applicants whose first language is not English must demonstrate their capacity to pursue a graduate-level program in English before admission. The standard test is the TOEFL. The Faculty of Graduate Studies sets a minimum acceptable score of 92 for the internet-based test. The following ESL tests will also be accepted with the stated minimum scores: IELTS, 7; PTE Academic, overall score of 65 and nothing below 54. English as a second language students must also submit one of the following tests; the Graduate Management Admissions Test (GMAT) - a minimum score of 550 is required; the GRE or the Law Standards Admissions Test (LSAT).

In summary it is imperative that in addition to your application we receive:

- A statement of career interest (one page should be sufficient);
- A current résumé;
- Official Transcripts;
- At least two academic letters of reference;
- A TOEFL score and GRE/GMAT (if applicable)

Although not required except for international students, all students may submit a score from the Graduate Management Admission Test (GMAT) in support of their application.

The Dalhousie School of Public Administration GMAT Number is 0957.

Applicants for the test should use an order form obtainable from the Registrar's Office of the nearest University, Dalhousie University, or you may write to the address below to obtain an information bulletin and registration form for the GMAT. If the order form is lost or omitted from the materials you receive, you should write directly to:

Graduate Management Admission Test  
Educational Testing Service  
Box 966  
Princeton, NJ, 08540 USA

For further information, email [dalmpa@dal.ca](mailto:dalmpa@dal.ca)

## General Admission Requirement for GDPA

Enrolment in the School is limited. Normally, competitive applicants will have attained a good second class standing (B+ (3.3 GPA) average) in their last 60 credit hours of university work.

Admission is based on an assessment of:

- Official transcripts from each institution attended;
- Two letters of reference;



- English Language Competency - English is the language of study at Dalhousie; therefore all applicants whose first language is not English must demonstrate their capacity to pursue a graduate-level program in English before admission. The standard test is the TOEFL. The Faculty of Graduate Studies sets a minimum acceptable score of 92 for the internet-based test. The following ESL tests will also be accepted with the stated minimum scores: IELTS, 7; PTE Academic, overall score of 65 and nothing below 54. English as a second language students must also submit one of the following tests; the Graduate Management Admissions Test (GMAT) - a minimum score of 550 is required; the GRE or the Law Standards Admissions Test (LSAT).

In summary it is imperative that in addition to your application we receive:

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Graduate Management Admission Test  
Educational Testing Service  
Box 966  
Princeton, NJ, 08540 USA

For further information, email [dalmpa@dal.ca](mailto:dalmpa@dal.ca)

## **General Admission Requirement for JD/MPA**

Candidates for the JD/MPA program must satisfy the entrance requirements of both the MPA and JD programs, and may obtain further information about the combined program by writing to the School of Public Administration and the Schulich School of Law. For admission, students must apply to both the School of Public Administration and the Schulich School of Law individually. Students applying for the MPA program may submit LSAT results in lieu of GMAT results.

## **General Admission Requirement for MPA/MLIS**

Students should apply separately to both the School of Public Administration and the School of Information Management. Students must qualify for both programs independently. Students may be registered in the first year of one program and apply to the other program during their first year.

## **General Admission Requirement for MPAM and GDPA(M)**

To be eligible for admission to the MPA (M) or GDPA(M) program, an applicant must have a Four-year Undergraduate degree from a recognized university (or a master's degree) with a B average (3.0 GPA on a 4.3 scale) or equivalent (as determined by Dalhousie University) in a recognized degree program, plus at least five years' relevant professional experience in public or non-for-profit service sectors (combined private sector professional experience may be considered on a case-by-case basis).

\*Applicants who do not meet the standard academic criteria may be required to submit a Prior Learning Assessment Portfolio/or a GMAT (results 550 or higher)

A complete application includes:

- Faculty of Graduate Studies Application Form:
  - Online version: <https://dalonline.dal.ca>
  - Paper version: [www.dal.ca/admissions/apply/applying\\_as\\_a\\_graduate\\_student.html](http://www.dal.ca/admissions/apply/applying_as_a_graduate_student.html)

- \$115 Application Fee
- Letter of Intent
- Resume/Job Description
- Two reference letters ( You must provide two references, preferably from supervisors (former or current) OR one supervisor and one academic. The Faculty of Graduate Studies reserves the right to request additional references. These must come directly from your referees in a sealed envelope. All references are considered confidential and as such cannot be returned to you. Your referees may use the forms provided below or write a letter of recommendation. Their original ink signature must be included.)
- Official Transcripts - Original and official transcripts are required from any/all post-secondary institutions attended. All transcripts (including English translations) must bear the official stamp/seal of the issuing institution and must be forwarded directly to Dalhousie University. Transcripts that state “issued to student” are not acceptable.
- TOEFL results, where applicable

It is the policy of Dalhousie University to confirm the authenticity of transcripts and letters of reference of all recommended applicants.

All admitted applicants must confirm acceptance in writing and provide a non-refundable deposit to the Student Accounts Office. This deposit will be applied toward tuition but will be forfeited if the student does not register in the academic year for which he or she was admitted. Please note that this deposit is separate from any application or pre-registration fees.

## Part-time Study

The programs offered through the school are available to students on a part-time basis. A part-time student may enroll in up to 15 credit hours during the 12-month period, September to August.

In order to ensure that graduate students benefit from a reasonable concentration of their studies, part-time programs leading to the GDPA must be completed within four years, and part-time programs leading to the MPA must be completed within six years.

## Master of Public Administration (MPA)

The MPA is a 54 credit hours graduate program (including a Professional Development program) designed for individuals prepared to undertake advanced professional study. Individual programs will vary in content to reflect each student's background and interests, while at the same time recognizing the central principles and functions of public administration.

### Course Requirements

The two-year MPA will require the successful completion of 30 credit hours of required courses, 24 credit hours of elective courses and the professional development program. Full-time students are required to complete all eight required courses during the first year of their program prior to being permitted registration in 6000 level courses and MGMT 5000: Management Without Borders: A Foundation Course for Masters Students in Management. Deviations from the program structure might be possible in exceptional circumstances and must be approved by the Program Manager. Part-time students are expected to complete the first eight required MPA courses prior to registering in 6000 level electives and MGMT 5000: Management Without Borders: A Foundation Course for Masters Students in Management. Part-time students should discuss their program of study with the Program Manager.

In the first year, students must take 24 credit hours which are:

- PUAD 5100.03: Organization Designs for Governance and Public Management
- PUAD 5120.03: Introduction to Public Policy
- PUAD 5130.03: Managerial Economics
- PUAD 5131.03: Public Economics
- PUAD 5140.03: Quantitative Methods for Public Sector Management
- PUAD 5170.03: Public Sector Human Resources Management
- PUAD 5180.03: Research Methods and Policy Analysis
- PUAD 5201.00: Professional Development 1

- PUAD 5202.00: Professional Development 2
- PUAD 5250.03: Strategic Financial Management

In the second year, students must take the following required three credit hour courses plus 24 credit hours of electives:

- MGMT 5000.03: Management Without Borders
- PUAD 6000.03: Ethics, Public Service and Governance
- PUAD 6201.00: Professional Development 3
- PUAD 6202.00: Professional Development 4

The remaining 24 credit hours will be electives. Some exemptions in required courses, resulting in either program modification or a reduction of credits, may be granted to well qualified candidates upon application to the Program Manager.

The one-year MPA will require the successful completion of up to 27 credit hours including up to nine credit hours from the 5000-level courses, PUAD 6000.03: Senior Seminar: Ethics, Public Service and Government and five electives.

## Graduate Diploma in Public Administration (GDPA)

The Graduate Diploma in Public Administration is a one-year, 27 credit hours, graduate program designed for public servants who hold a first degree, and for students wishing to obtain professional preparation for a career in public administration.

### *Course Requirements*

The GDPA requires the successful completion of 27 credit hours:

- PUAD 5100.03 F (Government Structure and Organization)
- PUAD 5120.03 F (Introduction to Public Policy)
- PUAD 5130.03 F (Applied Economics I) or PUAD 5131.03 W (Applied Economics II)
- PUAD 5140.03 F (Quantitative Methods I) or PUAD 5180.03 W (Research Methods and Analysis)
- PUAD 5170.03 W (Human Resource Management)
- PUAD 5250.03 W (Strategic Financial Management)
- and three additional graduate level three credit hours elective course from the PUAD series, to be selected in consultation with the Graduate Coordinator. (One graduate level three credit hour elective course may selected from outside of the program, in consultation and approval from the Graduate Coordinator).

When a student has a demonstrated competence in the area of a required course, an alternate course may be substituted if approved by the Program Manager.

## Juris Doctor/Master of Public Administration (JD/MPA) Program

The combined JD/MPA program is a four-year program which enables students to select courses leading to degrees of Master of Public Administration and Juris Doctor. A total of 39 credit hours Public Administration courses are required. The combined program is structured as follows:

Year 1

- First year courses of the MPA program (24 credit hours required courses)

Year 2

- First year courses of the JD program

Year 3

- nine credit hours of elective courses from the MPA program (one of these could be PUAD 6855: Internship, typically completed during the summer after first or second year of the program, as agreed upon with program coordinators).
- Civil Procedure
- Constitutional Law
- Compulsory Moot
- Plus 12-14 credit hours of courses from the JD program including a major paper class

#### Year 4

- six credit hours of elective courses from the MPA program. Students may choose to do a three-credit hour elective course from outside the MPA course offerings. This course must be approved by the MPA Program Manager.
- 23-25 credit hours of courses from the JD program, which must include The Legal Profession and Professional Responsibility, and a major paper class

MPA/JD are not required to participate in the Professional Development Certificate program. Students who wish to pursue the PUAD 6855: Internship should note that the first year of the PD program is a prerequisite for the Internship course.

## Master of Public Administration/Master of Library and Information Studies (MPA/MLIS) Program

The combined MPA/MLIS program is a three-year program which enables students to select courses leading to degrees of Master of Public Administration and Master of Information Studies. A total of 45 credit hours Public Administration courses are required, and the suggested order of the program is:

#### Year 1 (eight courses)

- Concentration in Information Studies

#### Year 2 (nine courses)

- eight first year required courses of the MPA program and MGMT 5000: Management Without Borders: A Foundation Course for Masters Students in Management

#### Year 3 (10 courses)

- four courses in Library and Information Studies
- one second year required course (PUAD 6000: Senior Seminar: Ethics, Public Service and Governance) plus five Public Administration elective courses

MPA/MLIS students are required to participate in the MPA Professional Development Certificate program during any two consecutive years of their three-year degrees.

#### ***Advanced Standing***

Advanced Standing of up to 27 credit hours (one year) may be granted to students who have completed graduate level courses which are relevant to the Masters in Public Administration Program, but which have not been used towards another degree. Students are advised to seek advanced standing when they apply for admission. All course exemptions or advanced standing must be approved by the Program Manager.

#### ***The Internship Program***

The internship offers MPA candidates an educational and professional development experience through preparation and competition for a work term with a public sector employer. The experience connects the academic program in the MPA and public service experience. The internship is a half credit course in recognition of its educational value. Please consult PUAD 6855.03: Internship for prerequisites and requirements. Placements in internships are not guaranteed, however, all eligible interns have been placed in the last seven years.

# Master of Public Administration (MPA) (Management) Program

The MPA (Management) is a 39-credit hour graduate program. The Graduate Diploma in Public Administration (Management) (GDPA (M)) is a 21-credit hour graduate program, both are designed for individuals who have public sector experience and wish to continue their academic studies part time via a blended learning model. The MPA (M) emphasizes the theory, analysis and practice of public policy and management. Dalhousie professors, in collaboration with public sector specialists, authored the MPA (M) courses to address the specific concerns and realities of today's public sector and NGO. A management team from the School of Public Administration ensures that the courses are integrated yet individually focused, and that the curriculum builds a firm academic foundation for the practice of public administration.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Requirements

The schedule of courses offered through the MPA (M) program provides students with flexibility and location choice. However, it is recommended that students register, early in the program, for what would be considered the core courses. They include: Policy Formulation, Economics, Government Structures, Research Methods, Managing Information Resources, Human Resources, Business and Government, and Strategic Management in the Public Sector.

Students have up to seven years to complete the course requirement (average timeframe is four years).

### *Core Courses*

- MGMT 5105.03: Government Structure and Organization
- MGMT 5110.03: Strategic Management in the Public Sector \*
- MGMT 5125.03: Policy Formulation & Analysis
- MGMT 5135.03: Managerial Economics
- MGMT 5146.03: Research Methods
- MGMT 5250.03: Strategic Financial Management
- MGMT 6501.03: Business and Government
- MGMT 6555.03: Managing the Information Resources
- MGMT 6650.03: Human Resources Management

### *Electives*

- MGMT 5140.03: Public Economics \*\*
- MGMT 6400.03: Municipal Government
- MGMT 6525.03: Program Evaluation \*\*\*
- MGMT 6700.03: Managing People in Diverse Organizations
- MGMT 6755.03: Intergovernmental Relations in Canada

\* Highly recommended that Strategic Management in the Public Sector is taken as close to the end of the program as possible.

\*\* Strongly recommended that students complete Managerial Economics prior to Public Economics.

\*\*\* Strongly recommended that students complete Research Methods prior to Program Evaluation.

## **Advanced Placement/Advanced Standing**

Please Consult Department.

### **MPA**

#### ***Required First Year Courses***

- PUAD 5100.03: Organizational Designs for Governance and Public Management
- PUAD 5120.03: Introduction to Public Policy
- PUAD 5130.03: Managerial Economics
- PUAD 5131.03: Public Economics
- PUAD 5140.03: Quantitative Methods
- PUAD 5170.03: Public Sector Human Resources
- PUAD 5180.03: Research Methods and Policy Analysis
- PUAD 5201.00: Professional Development 1
- PUAD 5202.00: Professional Development 2
- PUAD 5250.03: Strategic Financial Management

#### **Second Year Courses**

Students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6000 level courses or seek special permission from the Program Manager. All second-year elective course offerings are subject to resource availability.

#### ***Required***

- MGMT 5000.03: Management without Borders: A Foundation Course for Masters Students in Management
- PUAD 6000.03: Senior Seminar: Ethics, Public Service and Governance
- PUAD 6201.00: Professional Development 3
- PUAD 6202.00: Professional Development 4

#### ***Electives***

- PUAD 6010.03: Issues in Public Administration
- PUAD 6050.03: Strategic Management in the Public Sector
- PUAD 6140.03: Indigenous Governance & Water
- PUAD 6150.03: Info Public Policy & Decision Making
- PUAD 6235.03: Issues in Applied Economics
- PUAD 6300.03: Alternative Programme Delivery
- PUAD 6400.03: Local Government
- PUAD 6450.03: Economics of Health Policy
- PUAD 6500.03: Business and Government
- PUAD 6505.03: Interest Groups: Function and Management
- PUAD 6520.03: Programme Evaluation Seminar
- PUAD 6555.03: Management of Information (EGovernment) and Public Administration
- PUAD 6570.03: Equity and Diversity in the Public Sector
- PUAD 6625.03: Human Resource Management

#### **MPA (Management) Courses**

These courses are intended for students registered in the MPA (Management) program. For more information on this program please contact the Centre for Advanced Management Education - 1-800-205-7510 or (902) 494-6391, Email: [cege@dal.ca](mailto:cege@dal.ca).

- MGMT 5105.03: Government Structure and Organization
- MGMT 5110.03: Strategic Management in the Public Sector

- MGMT 5125.03: Policy Formulation & Analysis
- MGMT 5135.03: Managerial Economics
- MGMT 5140.03: Public Economics (elective)
- MGMT 5146.03: Research Methods
- MGMT 6400.03: Municipal Government (elective)
- MGMT 6501.03: Business and Government
- MGMT 6525.03: Program Evaluation (elective)
- MGMT 6555.03: Managing the Information Resource
- MGMT 6650.03: Human Resource Management
- MGMT 6700.03: Managing People in Diverse Organizations (elective)
- MGMT 6755.03: Intergovernmental Relations in Canada (elective)

## Course Descriptions

### **PUAD 5100 Organizational Designs for Governance and Public Management**

CREDIT HOURS: 3

This course examines the organizational designs of government for the purposes of governance and public management. It encompasses the basic constitutional and political designs of government; the structures and principles governing the relationship between the partisan-political and non-partisan public-service institutions of government; the organization and roles of the central executive and corporate policy and management agencies; the organization of portfolios, departments and agencies for the management of policy and operational functions; and, the structures and processes of accountability for governance and public management. The course is focused on the Canadian system of government but addresses basic questions of organizational theory and design in a comparative context.

### **PUAD 5120 Introduction to Public Policy**

CREDIT HOURS: 3

This course covers the process of designing, implementing, and monitoring public policies from a perspective that is endogenous to a political or administrative organization. This is a practical course, oriented towards developing the skills required by agents who contribute to the design and implementation of public policy. The course begins by introducing the vocabulary and concepts essential for thinking about public policy in a contemporary world. It then outlines the skills needed to develop and monitor public policy. Finally, it proposed putting into practice the skills acquired in the course and encouraging critical reflection on the limits of government intervention. This course aims to prepare students to intervene more effectively in the design, implementation, and monitoring of public policy within an administrative apparatus or organization

CROSSLISTED: POLI 5240.03, BUSI 5120

EXCLUSIONS: POLI 4240.03

FORMATS: Lecture

### **PUAD 5130 Managerial Economics**

CREDIT HOURS: 3

This class introduces the fundamental concepts of economics and helps to develop the analytical skills of students appropriate for practitioners in the public sector. It provides an understanding of basic microeconomic theories and principles in considerable depth, consistent with a graduate-level course in an interdisciplinary program. The course focuses on the theories of consumer and producer behaviour and their interaction in the market, of particular interest are situations of market failure and the resultant need for policy intervention.

### **PUAD 5131 Public Economics**

CREDIT HOURS: 3

This course introduces the basic principles macroeconomics, appropriate to a graduate-level course in an inter-disciplinary program. It is also concerned with the use and application of macroeconomic theory and the relevance of this theory in economic decision-making in a market economy with a large public sector. In particular, this course places a special emphasis on the role of government in the economy and on the application of economic theory in policy analysis within the framework of the Canadian federation. Together with Managerial Economics, these two courses provide a unique blend of theoretical rigor, empirical relevance, and sound policy applications.

### **PUAD 5140 Quantitative Methods**

CREDIT HOURS: 3

This course is designed to enable students to understand existing statistical analyses, as well as to conduct their own. Statistical analyses are presented with focus on application in the public sector, emphasizing the importance of statistical analysis in social research and policy making. Specific topics include descriptive and inferential statistics, measures of association for nominal and ordinal variables, analysis of variance techniques, as well as linear regression. In addition to the course, students are also offered tutorials in working with SPSS and MS Excel. Student assignments require work with large data sets.

### **PUAD 5170 Public Sector Human Resources**

CREDIT HOURS: 3

A major part of most public administration positions is human resource management. Therefore, it is important that public administrators understand the components of human resource management and their effect on an organization. In this course, human resource management is defined in a very broad sense, touching on all the major components of human resource management in order to give an overall concept or paradigm. The components are: 1) planning the need for public servants, 2) attracting the right people to be public servants, 3) placing the public servants in well matched jobs, 4) assisting public servants with their career development, 5) maintaining high performance with public servants and 6) evaluating public servants.

### **PUAD 5180 Research Methods and Policy Analysis**

CREDIT HOURS: 3

This course is designed to equip students with tools needed for the collection of quantitative and qualitative data in the context of an applied research project. Students learn how to combine qualitative analysis with quantitative techniques they acquired in PUAD 5140. Specifically, students learn to write literature reviews, to conduct personal interviews, to run focus groups, and to design survey questionnaires. All techniques discussed are applied to the analysis of public policy issues. Policy is analyzed with respect to its strengths and weaknesses from various stakeholders perspectives. Students are required to present their work in class.

### **PUAD 5201 Professional Development 1**

CREDIT HOURS: 0

This mandatory, non-credit course is the first course in the MPA Professional Development (PD) Certificate program. Over four courses and in partnership with the MPA Internship experience, the certificate program focuses on preparing MPA candidates with professional competencies expected by public sector employers, while promoting competency development in skills areas related to self-management, engagement, communication, leadership, innovation, and integrity. The courses are designed to mirror the way public sector organizations operate with respect to behavioral and technical competency and skill development.

EXCLUSIONS: PUAD 5200 XY

FORMATS: Experiential Learning

### **PUAD 5202 Professional Development - Self and Teams in the Workplace**

CREDIT HOURS: 0

This mandatory, non-credit course is the second course in the MPA Professional Development (PD) Certificate program. Over four courses and in partnership with the MPA Internship experience, the certificate program focuses on preparing MPA candidates with professional competencies expected by public sector employers, while promoting competency development in skills areas related to self-management, engagement, communication, leadership, innovation, and integrity. The courses are designed to mirror the way public sector organizations operate with respect to behavioral and technical competency and skill development.

CALENDAR NOTES: Students must complete PUAD 5201 prior to registering in PUAD 5202

PREREQUISITES: PUAD 5201

EXCLUSIONS: PUAD 5200 XY

FORMATS: Experiential Learning

### **PUAD 5250 Strategic Financial Management**

CREDIT HOURS: 3

Exploring issues at all orders of government, the course will review concepts of financial planning, public sector accounting, fiscal management, budgeting, and accountability. It will place finance, budgeting, and economic concepts within a holistic strategic management context. This includes the role and scope of government in fiscal management, the adaptation of economic concepts and measurement and outline activities included in financial management. A review of public sector accounting will develop an understanding of the assumptions and principles of accounting and the role it plays in strategic financial management.

FORMATS: Lecture

### **PUAD 6000 Senior Seminar: Ethics, Public Service and Governance**



CREDIT HOURS: 3

Designed as a culminating and integrating exercise for the MPA program, this course focuses upon a wide range of ethical problems in governance. Topics covered include conflict of interest, accountability, political neutrality, service to the public and codes of conduct. The course is based on case studies with a premium placed on discussion. Please consult the instructor for information on assignments and other course requirements.

CALENDAR NOTES: For students enrolled in the two-year MPA program, successful completion of the first year of studies is the prerequisite for this course. PREREQUISITES: Students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling 6000 level courses and MGMT 5000 or seek special permission from Graduate Coordinator.

### **PUAD 6010 Issues in Public Administration**

CREDIT HOURS: 3

This course provides a solid grounding in the legal underpinnings, the governance framework, and the concepts surrounding union-management and employee relations in the public service. This knowledge will strengthen the capacity of public servants to perform effectively whether they are employees, managers, or elected union officials. The course will examine in some detail the evolution of Labour rights and Labour relations in the federal public service, up to and including the implementation of the Public Service Labour Relations Act which has been implemented as part of the newly enacted Public Service Modernization Act. While this course will draw extensively from the federal experience, it will also provide opportunities to examine provincial, municipal, and private sector experiences. It will examine the roles and responsibilities of the various players within the legal framework which governs these relationships and explore the impact in the workplace of the various approaches to Labour management including the movement towards a less litigious Alternative Dispute Resolution (ADR) process as an alternative to the rights based processes and how this can affect the workplace.

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT5000, or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

### **PUAD 6020 Food Policy and Sustainability**

CREDIT HOURS: 3

This course explores the theories, concepts, and conundrums of food policy development in Canada. This course offers a critical analysis of agricultural income, marketing, adjustment and trade problems and policies in the developed countries, with emphasis on Canadian agricultural policies. Using a seminar style, the course examines policy and program options to create a sustainable, equitable and health promoting food system for Canada. Specific course topics will be determined at the beginning of the course based on the specific needs of registered students. The emphasis will be on addressing current challenges and knowledge gaps faced by students in their food and related studies. Sessions will make use of lecture formats, student presentations, discussion, and guest speakers.

FORMATS: Seminar

### **PUAD 6050 Strategic Management in the Public Sector**

CREDIT HOURS: 3

This course is an in-depth examination of the management of government organizations. Its topics include management control, strategy development, innovation, risk management and leadership. The more specific course goals are as follows:-To provide a process understanding of practices employed by government organizations to develop and implement their strategies-To provide insights into the practicalities of performing organizational functions, including management control, innovation, strategy development and risk management-To strengthen the ability to penetrate and critique prescriptive arguments about public management practices-To develop skills in designing practices suited to particular circumstances of application

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT5000, or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

FORMATS: Lecture

### **PUAD 6120 Citizen Engagement and Consultation: The Opportunities and Challenges of Public Engagement**

CREDIT HOURS: 3

This course examines the conceptual foundations and practice of citizen participation, especially in the context of planning and development decisions by municipal and provincial governments, and the techniques or methods that can be used to more effectively involve individual citizens and stakeholder groups in community decisions.

CROSSLISTED: PLAN 4120.03, PLAN 6120.03

### **PUAD 6130 Risk, Media, and Communications in Public Administration**

CREDIT HOURS: 3

This course offers students the opportunity to analyze and understand to greater depth the relationship between the government, risk, and the media.

Participants will: analyze media coverage of government and risk; learn techniques and tools that governments use to communicate with the media and to the public directly.

PREREQUISITES: PUAD 5100, PUAD 5120, PUAD 5180, PUAD 5130, PUAD 5140, PUAD 5170, PUAD 5180, PUAD 5250, PUAD 5131  
FORMATS: Lecture | Discussion

### **PUAD 6140 Indigenous Governance and Water**

CREDIT HOURS: 3

This course introduces students to the area of Indigenous Governance. The general aim of the course is to expose students to the history of the existing legal and political structures relating to Indigenous peoples in Canada and then to focus on how these structures actually operate (or fail to do so) in a given area. In other words, we will move from the more general to the specific and examine their interrelation. The first half of the course will be spent making our way through the last 150 years of political and legal conflict between Indigenous peoples and the Canadian state. In the second half, we will move onto a set of readings that specifically focus on Indigenous governance issues relating to water. We will be using resources related to (and some produced by) the Decolonizing Water Project ([www.decolonizingwater.ca](http://www.decolonizingwater.ca)). The goal of this project is to create a prototype of an Indigenous-led community-based water monitoring initiative that is rooted in Indigenous laws and is a practical expression of Indigenous water governance. The course will focus on issues that are related to this goal and offer students the opportunity to do research projects that can make a contribution to a cutting-edge area of Indigenous governance research.

PREREQUISITES: Students must successfully complete all eight required courses of the first year of the MPA program

FORMATS: Seminar

### **PUAD 6150 Information in Public Policy and Decision Making**

CREDIT HOURS: 3

This course addresses the role(s) of information in policy and decision-making at local, national, and international levels. Evidence-based policy making is relatively new and challenging. This course examines the research-policy interface, especially enablers and barriers to use of information of several domains and uses case studies to illustrate concepts.

CROSSLISTED: INFO 6100.03, ENVI 6100.03

FORMATS: Lecture

### **PUAD 6201 Professional Development 3**

CREDIT HOURS: 0

This mandatory, non-credit course is the third course in the MPA Professional Development (PD) Certificate program. Over four courses and in partnership with the MPA Internship experience, the certificate program focuses on preparing MPA candidates with professional competencies expected by public sector employers, while promoting competency development in skills areas related to self-management, engagement, communication, leadership, innovation, and integrity. The courses are designed to mirror the way public sector organizations operate with respect to behavioral and technical competency and skill development.

PREREQUISITES: Successful completion of PUAD 5201 and PUAD 5202 or special permission from the Graduate Coordinator or course instructor.

EXCLUSIONS: PUAD 6200 XY

FORMATS: Experiential Learning

### **PUAD 6202 Professional Development 4**

CREDIT HOURS: 0

This mandatory, non-credit course is the fourth and final course in the MPA Professional Development (PD) Certificate program. Over four courses and in partnership with the MPA Internship experience, the certificate program focuses on preparing MPA candidates with professional competencies expected by public sector employers, while promoting competency development in skills areas related to self-management, engagement, communication, leadership, innovation, and integrity. The courses are designed to mirror the way public sector organizations operate with respect to behavioral and technical competency and skill development.

PREREQUISITES: Successful completion of PUAD 5201, 5202 and 6201 or special permission from the Graduate Coordinator or course instructor.

EXCLUSIONS: PUAD 6200 XY

FORMATS: Experiential Learning

### **PUAD 6235 Issues in Applied Economics**

CREDIT HOURS: 3

This course addresses a selection of topics in applied economics that are of considerable significance for any economy. It is designed for those students who wish to develop the ability to (a) understand and interpret different economic programs and policies beyond the introductory level; and (b) help formulate and implement such policies. Topics covered will depend in part upon the interests of students, but some will be based upon the following areas: poverty and inequality; taxation; inflation and unemployment; stabilization policies; public sector economics; international trade and the balance of payments; technological innovation and growth. Each student will be expected to specialize in a topic of his or her choice and prepare a major paper for presentation in class. There will also be short assignments and a final examination. Please see the instructor for additional information about course requirements.

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level

courses and MGMT5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

### **PUAD 6300 Alternative Program Delivery**

CREDIT HOURS: 3

Alternative Methods in Program Delivery is a graduate and honours undergraduate level seminar which allows participants to conduct and present research on the increasing resort by governments at all levels to alternative methods of programme delivery. Over the last decade and a half, governments around the world have moved from designing and delivering programs themselves to utilizing the private sector, both profit and non-profit, for this purpose. These alternative methods have taken the form of the privatization of crown assets, public-private partnerships to address a myriad of concerns (from the design and construction of bridges and highways to the management of laundry facilities in institutions for long term care), user fees and charges, contracting out, and the adoption of business-like practices in their own operations. This course has two purposes. The first is to allow participants to explore methodologies for assessing the viability of alternative programme delivery in particular fields, based on the best practices of the past decade. The second is to allow participants to explore critically the use or proposed use of alternative methods of programme delivery in areas in which they have an interest. Each participant is expected to prepare a seminar paper of at least 5,000 words, to present their findings in class in a presentation not exceeding thirty minutes in length, and to respond to questions. In addition, participants are asked to prepare a critique of a paper by another participant, and to lead discussion on that paper.

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

### **PUAD 6400 Local Government**

CREDIT HOURS: 3

There is a renewed interest in local government resulting from population migration to urban areas, the need to invest heavily in improved and greener infrastructure that can be used to satisfy local service needs, and a trend towards a more inclusive public involvement in urban issues. This course looks at how local governments fit into the public sector framework, how provincial / national legislation empowers and limits them, and their governance and management. Services offered, and issues faced, by local governments vary with size, population density and with central government legislation. Issues facing local governments, and the central governments who determine municipal responsibilities and revenue sources, are researched, presented, and discussed. While the primary focus of the course is on local government in Canada, structures and practices used in other countries to address local government issues will be included. The course is conducted in a seminar style format (class size permitting)

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT 5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

### **PUAD 6420 Municipal Finance**

CREDIT HOURS: 3

Canadian local governments are arguably more challenged than the federal or provincial governments when raising sufficient revenue to meet their operational and infrastructure requirements. This course explores the reasons for this and puts forward potential solutions that reflect a solid understanding of the issues and sound public policy. The solutions could include greater revenue generation powers, expenditure reduction through transferring responsibilities, finding less expensive ways of providing services through internal efficiencies or outsourcing, or reorganizing municipal boundaries (territorial reform). The course begins with a focus on the fundamentals of local government finance to provide the background needed to address the broader issues. While the primary focus of the course is on Canadian municipal finance issues information on finance policies and structures of other countries will also be included. The course is conducted in a seminar style format (class size permitting).

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT 5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

### **PUAD 6450 Health Policy and Economics**

CREDIT HOURS: 3

This course focuses on health policy themes as they relate to the current situation in the Canadian health policy arena. Themes include population health determinants, health system types, physician remuneration methods, healthcare delivery models, health production, demand for healthcare, and health system efficiency. The course is conducted in seminar style format.

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT 5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

FORMATS: Lecture | Seminar

### **PUAD 6500 Business and Government**

CREDIT HOURS: 3

The focus of this course is twofold: first, how government and business influence one another and secondly, why collaboration is a growing reality enjoining public sector and private sector organizations and the implications for each sector and society as a whole. The course aims to understand the fundamental difference between the public interest and the private interest and how such differences are sorted out through contemporary governance systems. While the emphasis will be on the Canadian environment, a comparative perspective will also be used in light of many issues that are increasingly transnational in scope.

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT 5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

CROSSLISTED: BUSI 6009.03

### **PUAD 6505 Interest Groups: Function and Management**

CREDIT HOURS: 3

This course will attempt a systematic examination of the function and management of interest groups in Canada and, to a lesser extent, other western countries. It will begin by considering the functions such groups perform for their supporters on the one hand and, on the other, the role they play in 1) maintaining political systems; 2) securing and modifying public policy, and 3) implementing programs. It will explore the ways in which their structures and behaviour patterns vary according to the resources of the groups themselves, the nature of their concerns and the demands of the political/bureaucratic systems in which they operate. An important feature of the course will be a discussion of the internal management of groups. This discussion will include a review of how membership is secured and retained and how group resources are obtained and applied; the role of professional staff in developing group positions and in interacting between the interest group and government officials. In conclusion, the course will examine the role of interest groups in policy processes and the relationship between that role and the prospects for democracy in western politics. Approved with Canadian Studies.

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT 5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

CROSSLISTED: POLI 3228.03, POLI 5228.03

### **PUAD 6520 Program Evaluation Seminar**

CREDIT HOURS: 3

This course is focused on the construction of different types of evaluation frameworks for a set of government programs or initiatives. Students prepare a plan of how to evaluate their program of choice giving special attention to perspective taken and stakeholder interests, students identify relevant data sources, and data collection instruments and design a research framework that combines qualitative and Quantitative approaches. Specific research skills acquired in PUAD 5140 and PUAD 5180, are applied to a broader and large-scale evaluation framework. In addition, students are exposed to competing approaches to programme evaluation, as well as ethical issues within the discipline. Student presentations and class discussion are an integral part of the course.

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT 5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

### **PUAD 6540 Canadian Regional Economic Development**

CREDIT HOURS: 3

This course provides students with a solid understanding of regional economic development practice in Canada. Beginning with an exposure to economic development practice throughout the globe, the course then sequentially focuses on national, provincial and local economic development efforts, from both stand alone and integrated perspectives. The course will centre on desired outcomes of regional development, the translation of those outcomes into program activity and the theoretical underpinnings which support individual economic development initiatives. Economic development is a dynamic undertaking, with significant social and political consequences. Hence this highly interactive course will expose students to the risks and rewards of government policy making within a such a charged climate.

PREREQUISITES: Students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling 6000 level courses and MGMT 5000 or seek special permission from Graduate Coordinator.

### **PUAD 6555 Management of Information (E-Government) and Public Administration**

CREDIT HOURS: 3

The main objectives are to understand that information technologies provide means for public administrators to obtain, analyze, disseminate, and store information; to analyze the uses of new technologies; and to understand the opportunities and problems that information technologies present to public administrators on personal, organizational and international levels. Each course addresses separate but related issues of managing information in the public sector. Some of the courses look at the history of information technology to place present day devices into perspective. The topics for other courses relate IT to smart communities, professional development, virtual offices, digital divide, management information and unethical behavior in public offices.

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level

courses and MGMT 5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

### **PUAD 6570 Equity and Diversity in the Public Sector**

CREDIT HOURS: 3

This is a theoretical course on inclusion, participation and inequality in public service employment and public service delivery. It explores representativeness as an ideology and the management practices and policy initiatives which arise from this notion. The course considers the questions: What is equality? Why do we want equality? What difference does it make to have equality-oriented initiatives? What is equity and diversity? What results are being achieved? What are the underlying issues of inequality difference and inclusion as they relate to Canadian democracy and global issues of equality?

PREREQUISITES: MPA students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling in 6xxx level courses and MGMT 5000 or seek special permission from the Graduate Coordinator. Students from outside of the MPA program must seek permission from the course instructor.

### **PUAD 6625 Special Topics in Human Resource Management**

CREDIT HOURS: 3

This course explores current topics in human resource management and policy in the public sector. The topic emphasis varies with issues and trends in public service. The approach to human resources explores the relations of organizations, work, and people in the public sector. The aim of the course is to examine topics, how they are known as well as methods of investigation and problem solving. To learn of current topics, please consult the professor.

PREREQUISITES: Students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling 6000 level courses and MGMT 5000 or seek special permission from Graduate Coordinator.

### **PUAD 6780 Governance and Administration in Developing Countries: Issues and Controversies**

CREDIT HOURS: 3

This course examines analytical, normative, and political issues of public administration in developing countries. It considers the scope of development administration as a sub-field of public administration; public sector organization and management including public services, public enterprises, decentralization and rural development, financial systems, human resource management, aspects of state economic management (with the use of case studies) and institutional aspects of aid administration (with IMF and World Bank cases).

PREREQUISITES: Students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling 6000 level courses and MGMT 5000, or seek special permission from Graduate Coordinator.

CROSSLISTED: POLI 3302.03/5302.03

FORMATS: Seminar

### **PUAD 6855 Internship**

CREDIT HOURS: 3

The internship is half credit course which includes a program of professional development, a challenging work term with a public sector employer and the mentorship of a first year MPA candidate (in the terms following the work term). The Internship course recognizes the educational value of a high-quality work experience as well as the developmental value of supervised work terms and preparation for work terms. The aim of the internship is to integrate the academic program and practical public service experience. School approved and employer sponsored work terms are awarded competitively on the basis of merit. They are paid (paid by the employer), 14-16 weeks normally in the spring and summer term between the first and second year of the program. The opportunity for a work term placement is normally available to students:- who have successfully completed the full first year of the MPA program with a B or greater in each required course- who have completed the Professional Development Requirements -who have submitted the required documents (general resume and sample job application), at the expected level of competence in preparation for competing for work terms. The full details of requirements are available in the syllabus and the Internship Contract. Previous work placements have been in the federal, provincial and municipal levels of government, international and non-governmental organizations and in the private sector. However, the emphasis is on public sector employers

CALENDAR NOTES: Regular Course fees apply, and students must be registered and successfully complete PUAD 5200 X/Y.

PREREQUISITES: Students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling 6000 level courses and MGMT 5000 or seek special permission from Graduate Coordinator.

### **PUAD 6910 Directed Reading**

CREDIT HOURS: 3

See PUAD 6900.

### **PUAD 6920 Directed Reading**

CREDIT HOURS: 3  
See PUAD 6900.

### **PUAD 6925 Management Information Systems**

CREDIT HOURS: 3

This course is meant to provide the student with a basic knowledge of information systems and their role in business organizations. Fundamental to this basic knowledge is an understanding of the variety of information systems in business. An understanding of the use of computers in current and future information systems is stressed.

**PREREQUISITES:** Students must successfully complete all eight required courses of the first year of the MPA program prior to enrolling 6000 level courses and MGMT 5000 or seek special permission from Graduate Coordinator.

**CROSSLISTED:** BUSI 5511.03

### **PUAD 6940 Directed Readings**

CREDIT HOURS: 3

See PUAD 6900.

### **PUAD 6942 Directed Readings**

CREDIT HOURS: 3

See PUAD 6900.

## **Social Work**

Location:

Mona Campbell Building

1459 Le Marchant Street

Suite 3201

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-3760

Fax Number: (902) 494-6709

Email Address: [social.work@dal.ca](mailto:social.work@dal.ca)

Website: [www.socialwork.dal.ca](http://www.socialwork.dal.ca)

## **School of Social Work**

The School of Social Work's vision is a commitment to building a socially just society, defined as one that upholds and validates the values of equality, diversity, inclusiveness, democracy, and concern for human welfare. We manifest and advance curricula, scholarship and school culture that are congruent with those values. The school was founded in 1941 to meet a need for professionally qualified social workers in the Atlantic region. The school amalgamated with Dalhousie University in 1969 to become one of the nine constituents of the Faculty of Health.

## **Staff**

### **Director of the School**

**MacDonald, J.**

### **Associate Director**

**Karabanow, J**

### **Graduate Coordinator**

**Brown, C.**

## Professor Emeritus

**Thomas Bernard, W.**, BA (Mt. St. Vincent), MSW (Dalhousie), PhD (Sheffield, England)

**Wien, F. C.**, BA (Queen's), MA, PhD (Cornell)

## Professors

**Karabanow, J.**, BA (Hons), MA (McGill), PhD (Wilfrid Laurier)

**MacDonald, J.**, BSW (STU), MSW (Carleton), PhD (Memorial)

**Ungar, M.**, BA, BSW, MSW (McGill), PhD (Wilfrid Laurier)

**Weinberg, M.**, BA (Toronto), MSW (Smith College), PhD (Toronto)

## Associate Professors

**Brown, C.**, BA, MA (Manitoba), MSW (Carleton), PhD (Toronto)

**Brown, M.**, BA Hon, BSW, MSW (Dalhousie), PhD (Memorial)

**Hanrahan, C.**, BA (McGill), MA (Toronto), MSW (York), PhD (Toronto)

**Lewis, T.**, BA, (Catholic University of America, USA), MSW (University of Kentucky, USA), PhD (Boston University, USA)

## Assistant Professors

**Baikie, G.**, BSW (Memorial), MSW (Dalhousie), PhD (Memorial)

**Bejan, R.**, BA (Lucian Blaga U, Romania), S.S.W. Dip (George Brown College), MSW (Toronto), PhD (Toronto)

**Bryan, C.**, BA (U of Winnipeg), BSW, MSW (McGill), PhD (Dalhousie)

**Johnstone, M.**, MEd (Ottawa), BSW (Carleton), MSW, PhD (Toronto)

**Manning, E.**, BA, BSW, MSW (Victoria), PhD (York), PhD (Simon Fraser)

**Mbakogu, I.**, BA, MA, MSW, PhD (Univ of Ibadan), PhD (McGill)

**Ross, N.**, BA, BSW, MSW, PhD (Bradford UK)

**Wu, H.**, B.Eng (Sichuan University, China), M. Eng. (Sichuan University, China) PhD (UBC, Vancouver)

## Adjunct (FGS)

**Campbell, C.**, B.Sc (Kings), B.Ed. (Acadia), MSW (Carleton), PhD (Memorial, NL)

**Harbison, J.**, BA, Bsoc Stud (Dublin Trinity Coll), Grad Dip SW (Edinburgh), PhD (Toronto)

**Petty, M.**, BA (South Carolina), MSW (Dalhousie), PhD (Univ Pennsylvania)

**Torres, S.**, BSW, MSW (Carleton), PhD (U of Ottawa)

**Wien, F. C.**, BA (Queen's), MA, PhD (Cornell)

## Adjunct (Retired)

**Thomas Bernard, W.**, BA (Mt. St. Vincent), MSW (Dalhousie), PhD (Sheffield, England)

# Admission Requirements

All applicants must satisfy the admissions requirements of the Faculty of Graduate Studies, Dalhousie University as stated in this calendar.

English is the language of study at Dalhousie; therefore, all applicants whose first language is not English must demonstrate their capacity to pursue a graduate-level program in English before admission. The standard test is the TOEFL. The Faculty of Graduate Studies sets a minimum acceptable score of 92 for the internet-based test. The following ESL tests will also be accepted with the stated minimum scores: IELTS, 7; PTE Academic, overall score of 65 and nothing below 54. All applicants must satisfy the admissions requirements as set out by the [Faculty of Graduate Studies](#).

Please visit [www.socialwork.dal.ca](http://www.socialwork.dal.ca) for a complete listing of MSW admission requirements and application instructions

## Canadian Residency Requirement for Distance Study

The on-line (distance delivery) option is only available to residents of Canada (citizens and permanent residents) who currently reside in Canada.

## MSW Program

There are two entry points to the MSW program:

1. BSW Entry (one-year MSW program) - A baccalaureate degree in social work (BSW) is required. This option is available on campus or online.
2. Non BSW Entry (two-year MSW program) - A four-year undergraduate degree (120 credit hours) in a related field is required. **This option is on campus on a full-time basis.**

All MSW applicants are required to have:

- A minimum cumulative GPA of 3.0 (on a 4.3 scale) or an equivalent cumulative average of at least B in the last 60 undergraduate credit hours completed. Graduate level credits are not used in the admission average.
- Suitability for the study and practice of social work

**NOTE:** *There is no transfer credit or advanced standing awarded in the MSW program.*

## Special Student Status

Special student status is not available for enrolment in graduate courses in Social Work. Courses are normally restricted to students who have applied and been accepted to the MSW degree programs; however, non-social work students may be permitted to register for a MSW elective with permission of the Graduate Coordinator.

## Selection Criteria

The number of seats offered each year to graduate students is limited. There are no deferrals granted in MSW Admissions. Applicants who do not register in the fall semester following acceptance, must re-apply. Candidates are selected according to their qualifications. The MSW Admissions Committee makes its selection on the basis of the following criteria:

- Academic performance (last 60 undergraduate credit hours).
- Clearly defined field of practice related to Social Work or paid work experience (One-year MSW); interest in a field of practice related to Social Work and volunteer and/or paid experience in practice related to Social Work (Two-year MSW).
- Intellectual capacity demonstrated in a thoughtful and reflective Statement of Scholarly Interest
- Strength of references.
- Appropriateness of educational/professional goals to the school's course offerings;
- Personal suitability for social work.

## Statement of Scholarly Interest

The Statement of Scholarly Interest is an important component of the MSW application. This statement explores a student's decision to pursue a graduate level degree in Social Work.

## Personal Suitability

Aptitude and fitness for the profession of Social Work, as determined by the MSW Admissions Committee, is a requirement for admission as well as for continuation in the program. (See Section V: [Required Withdrawal on Grounds of Unsuitability section.](#))

## Affirmative Action Policy

The School of Social Work has an affirmative action policy for applicants who are Acadian, Aboriginal, African Canadian, members of other racially visible groups, persons with (dis)Abilities, and for Lesbian, Gay, Bisexual, Transgender, Two-Spirited, Queer and Intersex (LGBTQI) people. The school is committed to admitting and graduating the highest possible number of students who qualify under this policy.

The admissions prerequisites described in the above section are the same for all applicants. Each candidate who applies under the affirmative action policy is, however, considered on the basis of their qualifications for graduate study in Social Work rather than in relation to other candidates.

## Application Procedure

Applications for admission are reviewed once a year following the application deadline date of November 15.

MSW application packages include instructions, application, application fee, reference forms, work/volunteer experience summary sheets, and guidelines for the Statement of Scholarly Interest. The cover sheet for the latter includes a place for eligible candidates



to indicate whether they wish to apply under the Affirmative Action policy. MSW application packages may be found on the School's website [www.socialwork.dal.ca](http://www.socialwork.dal.ca).

Incomplete or late applications cannot be considered. Each applicant is notified by mail of the MSW Admission Committee's final recommendation to the Dean of Graduate Studies. Acceptances are conditional on the approval of the Dean followed by official notification from the University Registrar.

## **Scholarships, Bursaries, Teaching Assistantships and Financial Aid**

For information on prizes, bursaries, scholarships and loans available to graduate students, consult the relevant section of this graduate calendar, or go to [www.socialwork.dal.ca](http://www.socialwork.dal.ca).

# **Curriculum Requirements - Masters of Social Work Degree Program**

## **MSW Program**

### **MSW Program Year One**

The MSW program Foundation Year consists of 24 credit hours of courses and field work.

The MSW program Foundation Year is only available on a full-time basis on campus.

**Please Note: The Foundation Year is not available online. The program is to be completed in one academic year.**

Class sequencing for all students will be the same in year one, except for electives chosen. Courses are offered during specific times in each term.

### **MSW Program Year Two**

Requirements consist of either

- a) a course-based option: 30 credit hours Social Work core courses
- b) a thesis option: 24 credit hours Social Work courses, 6 credit hour thesis

The MSW is available on a full-time or part-time basis to students. Qualified BSW graduates may be admitted directly to the one-year MSW program (30 credit hour). These curriculum requirements cannot be reduced by advanced placement or transfer credit in relation to any graduate courses taken prior to MSW registration.

Distance students admitted to the MSW program and on-campus students who choose to complete their MSW program on a part-time basis would normally complete the course requirements over a two or three-year period.

### ***Class Sequencing for all Students***

Class sequencing for all students will be the same, except for electives chosen. Courses are offered during specific times in each term.

### ***Class Sequencing for Full-Time Students***

The core courses (including Field) are offered during specific times in each term.

Full-time students who take a course-based program (non-thesis) may expect to complete the program by July of the following year and to graduate in October. Full-time students who elect to do a thesis should expect to spend eight to twelve months more for completion.

### ***Class Sequencing for Part-Time Students***

To maintain the integrity of the part-time student's academic program, core courses are taken in a prescribed sequence. The elective courses may be taken concurrently with the core courses in any year.

Part-time students who take a course-based option (non-thesis) may expect to spend two to three years to complete the program, graduating in May or October. Part-time students who elect to do a thesis should expect to spend an additional twelve to eighteen months for completion.

\* Continuation as a “Thesis Only” student, for both full-time and part-time students, requires continuous registration and payment of continuation fees every term until all requirements are complete.

\* It is important for campus students to note that most of the MSW core courses and the requisite agency field placement are available during daytime hours only.

### ***Field Education for Year One and Year Two***

Both year one and year two require a 450-hour field placement. Students should note that the 3-credit hour field education course includes a field seminar (held bi-weekly) in addition to a field placement of 450 hours in an appropriate agency other than the student's place of employment. Placements are possible in a student's workplace only under exceptional circumstances (see field manual for criteria). The Field education course is undertaken between January and end of June (on-campus) and between September and April (distance) concurrently with a bi-weekly field education seminar, which is online for distance students. The MSW Field Manual (which can be found at <http://socialwork.dal.ca/Educational%20Programs/Field%20Education/>) contains the policies and procedures which define various aspects of the Field Education course.

Placement agencies set their own criteria for accepting MSW student placements. For example, placements in physical and mental health typically require MSW students to have at least two years of direct social work experience.

Confirmation of field placements requires advanced planning as there is considerable coordination required for each student placement. Incomplete and/or late submissions will not be accepted.

### ***Electives***

At least one elective must be taken in the School of Social Work if not completing a thesis. Any electives taken outside the school (e.g. a graduate course at Dalhousie University or another university) requires approval and completion of the letter of permission form.

Registration in elective courses is subject to availability.

## **Regulations**

All students are required to be familiar with and to observe University, Faculty of Graduate Studies and School of Social Work regulations. Students should therefore request a Graduate calendar when they register.

Please refer to [Faculty of Graduate Studies Section V. Registrations Procedures and Regulations](#).

## **Grading Requirements**

Students are governed by the grading regulations of the Faculty of Graduate Studies [dalgrad.dal.ca/](http://dalgrad.dal.ca/)

## **Required Academic Withdrawal**

A student who fails to meet the minimum grade requirement of “B-” in a course will be withdrawn from the MSW program by the Faculty of Graduate Studies. Students who are withdrawn may submit a formal written request to be reinstated.

If the student is re-admitted, the failed/ uncompleted course(s) must be repeated with a final grade of at least B-. If the failed/uncompleted course was an elective, it can be replaced with another elective.

Please refer to Graduate Calendar Section 4.2.5 [gr.cal.dal.ca/](http://gr.cal.dal.ca/)

## **Required Withdrawal on the Grounds of Unsuitability**

The school acting through its Program Committee and its Director may require a student to withdraw if judged to be unsuitable in aptitude and fitness for the profession of Social Work. Because the nature of the study and practice of Social Workplaces clients in a position of special trust in relation to social workers and social work, certain impairments or some types of conduct unbecoming to a member of the social work profession may be grounds for dismissal, or suspension. Aptitude and fitness for the profession of Social Work, as determined by the MSW Program Committee, are requirements for continuation in the program.

The following list of examples illustrates the criteria used to assess the unsuitability in aptitude and fitness. This list should not be considered to exclude other such behaviors:

1. conviction of criminal activity (e.g., assault, sexual assault, fraud, and drug trafficking).
2. persistent substance abuse (e.g., alcoholism, drug addiction, use of illegal drugs).
3. any medical condition which affects an individual's ability to perform as a social worker if that condition is chronic and/or recurring and affects judgments.
4. unethical behaviour (see Nova Scotia Association of Social Workers Code of Ethics, 1994).

The MSW Committee will consider the student's situation to determine whether they are fit for the study and practice of Social Work. The principles of confidentiality, natural justice and due process are observed in all Committee deliberations.

## Sexual Harassment

The School is governed by the Sexual Harassment Policy and Procedures of Dalhousie University. For more information, see [Graduate Calendar: Resources and Services](#) - Sexual Harassment Office.

## Master of Social Work (MSW) Degree

In line with the school's vision and mission, the master of social work program embraces a critical and anti-oppressive, social justice approach to social work practice that includes an emphasis on critical analysis and theoretical perspectives, critical social policy, critical practice and critical clinical approaches, research skills and professional values. Students will be able to focus on areas of their choice (such as physical and /or mental health, substance use problems, trauma, community development, direct practice with individuals families and groups, social policy and social administration, international social work, and research) through core courses, elective offerings, research endeavors, thesis option in year two, independent studies and field. Please consult our website [www.socialwork.dal.ca](http://www.socialwork.dal.ca) for updates to our MSW Degree program.

Note: In order to practice social work in Nova Scotia, all persons must have a social work degree (BSW or MSW ) AND be approved for practice by the Board of Examiners of the Nova Scotia College of Social Workers. Persons applying to the Board to practice social work should contact the address below for further information:

The Registrar of the Board of Examiners  
Nova Scotia College of Social Workers  
1888 Brunswick Street, Suite 700  
Halifax, NS B3J 3J8  
Telephone: (902) 429-7799

### *Program Objectives*

The School of Social Work adheres to the principles of adult learning in its educational approach. This approach is applicable to students with special or concurrent professional social work experience. In the course of their study, MSW students are encouraged to identify and pursue their learning goals within the parameters of the curriculum and the objectives of the program, which include the following:

- Approaches to social work that reflect critical and anti-oppressive perspectives.
- Development of an understanding of the methods for critical appraisal and systematic inquiry related to existing practice theories, models of intervention and personal practice experiences and abilities;
- Application of these means to existing and new knowledge regarding practice contexts, practice-related issues, practice theories, models of intervention and personal practice experience and abilities;
- Acquisition of new knowledge with respect to practice contexts, theories and interventions, including an area of practice of particular interest to the student;
- Integration of the new knowledge acquired into practice situations which support the development of personal and social change.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Notes

### REQUIRED COURSES

#### YEAR ONE FOUNDATION YEAR (NON BSW ENTRY) FULL-TIME CAMPUS ONLY

SLWK 5001.03 Social Work Theory for Critical Practice

SLWK 5002.03 Canadian Social Welfare and Policy Analysis: Historical and Contemporary Contexts

SLWK 5003.03 Critical Clinical Practice Foundations for Social Work Intervention

SLWK 6001.03: Theories and Practices of Anti-Opressive Social Work in Diverse and Intersecting Communities

SLWK 7400.03: Integrated Approaches for Social Work Practice

SLWK 5004.03 Field Work and Seminar

2 Electives - .06

Total credit hours = 24

### REQUIRED COURSES

#### YEAR TWO: ADVANCED YEAR (BSW ENTRY) CAMPUS/DISTANCE

SLWK 6341.03: Critical Perspectives on Social Work Practice Intervention

SLWK 6381.03: Social Policy Issues and Analysis for Practice

SLWK 7001.06: Social Work Practice Research

SLWK 6540.03 Critical Approaches to Mental Health and Addiction in Social Work Practice

SLWK 6002.03 Critical Clinical Practice and Intervention in Social Work

SLWK 6415.03: Field Work and Seminar

SLWK 9000.00: Master's Thesis .06 and 1 Elective .03

or

3 Electives - .09 (One elective must be at the School of Social Work if taken course based rather than thesis-based option).

Total credit hours = 30

### Elective Course Descriptions

#### *A. Standing Electives*

SLWK 5110.03: Africentric Perspectives in Social Work

SLWK 5160.03: Aboriginal Perspectives on Service Delivery and Practice

SLWK 5380.03: (dis)Ability: Policy and Practice

SLWK 6003.03: Queering Social Work: Sexual and Gender Diversity

SLWK 6363.03: Postmodern and Narrative Social Work Practice

SLWK 7410.03: Social Work in Health Systems

***B. Rotating Electives***

SLWK 5120.03: International Social Work

SLWK 5130.03: Critical Perspectives on Ageing and Practice

SLWK 6365.03: Community and Socio-Economic Development

SLWK 6370.03: Advanced Practice Skills

SLWK 6385.03: Community and Social Change Analysis

SLWK 6500.03: Interventions with Families

SLWK 6510.03: Women, Social Policy and Social Citizenship

SLWK 6520.03: Current Issues and Trends in Social Work Supervision

SLWK 6530.03: HIV/AIDS and Social Work Practice

***C. Independent Study (Two allowed)***

SLWK 5830.03: Independent Study

SLWK 5831.03: Independent Study

## Course Descriptions

**SLWK 5001 Social Work Theory for Critical Practice**

CREDIT HOURS: 3

This course recognizes that theory guides practice and practice informs theory. It will explore how theories have evolved in social work from those centering in psycho-dynamic theory and the problems of individuals to critically based anti-oppressive approaches that contextualize individual struggle. In this course students will learn not only a variety of social work theories, but how they translate into practice. Students will have an opportunity to apply theories to direct practice through case vignettes and role plays.

RESTRICTIONS: MSW

FORMATS: Lecture

**SLWK 5002 Canadian Social Welfare and Policy Analysis: Historical and Contemporary Contexts**

CREDIT HOURS: 3

This course reviews the historical development and contemporary context of Canadian social work and social welfare. The contradictory nature of the social work profession is explored alongside paradoxical ethical dilemmas. We explore the welfare state and the global economy, policy alternatives to current economic redistribution, poverty, feminist economics, and policy formulation in the construction of the family. Theories of the welfare state are explored with attention to the impact of the welfare state on diverse communities.

RESTRICTIONS: MSW

FORMATS: Lecture

**SLWK 5003 Critical Clinical Practice Foundations for Social Work Intervention**

CREDIT HOURS: 3

This course will develop a foundation for critical clinical practice within the context of social work values, ethics, theory, and analysis. It will apply a critical clinical approach to the understanding and provision of direct social work practice intervention. Through a social justice lens a range of practices approaches and practice skills are explored. Students will learn how to apply a critical clinical social work practice framework through integrating experiential learning

with critical practice theory.

RESTRICTIONS: MSW

FORMATS: Lecture

### **SLWK 5004 SLWK Field Work Class**

CREDIT HOURS: 3

The foundation field education course provides students with opportunities to integrate learning and practice through a supervised social work experience related to the specified learning goals. The course includes supervised social work practice in the field for a total of 450 hours and a concurrent seminar. The placement site is determined through consultation and agreement among the student, the Field Education Coordinator or designate and the agency.

FORMATS: Lecture

### **SLWK 5110 Africentric Perspectives in Social Work**

CREDIT HOURS: 3

The course provides students with an opportunity to engage in critical dialogue, reflection and action about historical and contemporary experiences of African Nova Scotians and Africans in the Diaspora. The course also focuses on awareness of Africentric theory, and its application in social work practice with Africans and non-Africans.

CROSSLISTED: SLWK 3110.03

### **SLWK 5120 International Social Work**

CREDIT HOURS: 3

This course introduces students to various 'worlds' of social work practice throughout the globe. Theoretical and practice grounding regarding development issues and social welfare systems within a global context is given. There will be encouragement to develop a critical and reflective stance toward the practice of social work in a global world.

FORMATS: Lecture | Discussion

### **SLWK 5130 Critical Perspectives on Ageing and Practice**

CREDIT HOURS: 3

The course examines the social construction of aging and its relationship to the formation of gerontological knowledge. It explores the experiences of older people in both formal and informal service delivery systems and considers the extent to which the nature of and type of services offered, meet the needs of diverse groups of older people.

FORMATS: Lecture | Seminar | Discussion

### **SLWK 5160 Aboriginal Perspectives on Service Delivery and Practice**

CREDIT HOURS: 3

This course is offered to MSW students enrolled at the School of Social Work, Dalhousie University. Aboriginal Perspectives will be explored through both historical and contemporary perspectives. Students will have an opportunity to explore historical, social, and political realities and perspectives from Aboriginal peoples including Aboriginal perspectives on Indigenous social work practice. Through critical reflection and analysis students will have the opportunity to re(articulate) their own framework of social work practice in relation to Aboriginal perspectives on service delivery and social work practice.

### **SLWK 5380 (dis)Ability: Policy and Practice**

CREDIT HOURS: 3

(dis) Ability will be examined from an anti-oppressive, social constructivist, rights-based lens, focusing primarily on three areas of exploration: (dis)Ability identity – how it is constructed, perceived, and utilized within and ablest world; societal location of (dis)Ability – examining the historical and current day (dis)placement of people with (dis)Abilities; and, policy/practice implications, ranging from grassroots (dis)Ability organizations to government legislation.

### **SLWK 5830 Independent Study**

CREDIT HOURS: 3

This option is available to students with a specific area of interest. A student may develop an Independent Study with a faculty supervisor on the subject of research interest to both. It is essential that the student follow the School's Independent Study Guidelines. The proposal must be approved by the Graduate Coordinator.

### **SLWK 5831 Independent Study**

CREDIT HOURS: 3

This course is available to masters of social work students with a special area of interest. A student may develop an Independent Study with an available faculty supervisor on a subject of interest to both. The student must follow the school's Independent Study Guidelines. The independent study proposal must be approved by the Graduate Coordinator.

### **SLWK 6001 Theories and Practices of Anti-Oppressive Social Work in Diverse and Intersecting Communities**

CREDIT HOURS: 3

Racism, colonialism, sexism, homophobia, ableism, and other forms of oppression are in conflict with the “caring” notion of the social work profession. Multiple forms of oppression frame everyone’s life. Social work intervention may reinforce oppression, condone it through non-action or notions of neutrality, or challenge oppression. The aim of this course is to unravel the underlying threads of multiple and intersecting oppression and the various sources and forms of oppression and to develop practice strategies that seek to challenge oppression.

RESTRICTIONS: MSW

FORMATS: Lecture

### **SLWK 6002 Critical Clinical Practice and Intervention in Social Work**

CREDIT HOURS: 3

This course provides a clinical approach to an advanced understanding and provision of direct critical clinical social work practice intervention which supports social justice. A range of practice approaches will be explored through integrating experiential therapeutic learning with understanding the theoretical underpinnings of clinical work. Attention will be given to co-occurring and complex substantive issues addressed in therapy with an awareness of the impact of trauma and violence and with a particular focus on the experiences and needs diverse communities.

RESTRICTIONS: MSW

FORMATS: Lecture

### **SLWK 6003 Queering Social Work: Sexual and Gender Diversity**

CREDIT HOURS: 3

This course provides an overview of queer history and oppressive social policies and practices and emphasizes activism, social movements, pride, and visible community building. It will explore why queer social work education, research and practice are important to inclusive and relevant social work practice and demonstrates how queer theory critically disrupts problematic everyday assumptions about social life including heteronormativity and homonormativity. This course will emphasize sexual and gender diversity, identity, and expression and multiple intersecting oppressions within LGBTQI+ communities.

RESTRICTIONS: MSW

FORMATS: Lecture

### **SLWK 6341 Critical Perspectives on Social Work Practice Interventions**

CREDIT HOURS: 3

The course will provide students with an opportunity to examine, discuss, and debate historical and current social work theories and their application to social work methods of practice with specific populations who are served by social workers.

### **SLWK 6363 Postmodern and Narrative Social Work Practice**

CREDIT HOURS: 3

Rooted in social constructionism and post-modernism, narrative therapy emphasizes the idea w live stored lives. This course will integrate the theory and process of narrative practice through externalizing unhelpful stories and re-authoring preferred stories. Small groups will create and work with a case story adapted from film

### **SLWK 6365 Community Socio-Economic Development**

CREDIT HOURS: 3

This course explores socio-economic communities and regions that are economically disadvantaged with high rates of poverty and underemployment. It examines the leading theoretical frameworks that seek to explain high rates of poverty and unemployment, the policy-strategy directions that occur, and current attempts to achieve socio-economic development. This course addresses two contradictory tendencies: (1) the intensification of neo-liberalism and growing social inequalities and (2) the growing interest in improving the quality of life for communities by utilizing their strengths.

RESTRICTIONS: MSW  
FORMATS: Lecture

### **SLWK 6370 Advanced Practice Skills**

CREDIT HOURS: 3

This course is designed to develop advanced practice knowledge and skills. Much of the learning is experiential. Students will be encouraged to think critically about the assumptions that underpin various approaches to practice through a critical clinical and social justice lens.

RESTRICTIONS: MSW  
FORMATS: Lecture

### **SLWK 6381 Social Policy Issues and Analysis for Practice**

CREDIT HOURS: 3

The course critically examines the policy-making process and its social work practice implications. The interplay between economic and social policy in an age of globalization and neoliberalism will cultivate a deeper understanding of the limitations of current social welfare programs. This course provides students with theoretical interpretations of the welfare state in advanced industrial societies, consideration of the economic, political, social, and demographic factors that lead to change in social policy and their implications for social work practice.

RESTRICTIONS: MSW  
FORMATS: Lecture

### **SLWK 6385 Community and Social Change Analysis**

CREDIT HOURS: 3

There are tensions within the concept of community between marginalization and/or self-determination. Through case studies, the course explores these tensions as they occur in the field of community “care” and expanding field of social work practice. The theoretical base for the course draws on a variety of perspectives such as communitarianism, eco-feminism, social ecology, managerialism, neo-liberalism, and new” social movement theory.

### **SLWK 6415 Social Work Field Course**

CREDIT HOURS: 3

The field education course provides students with opportunities to integrate learning and practice through a supervised social work experience related to the specified learning goals. The course includes supervised social work practice in the field for a total of 450 hours and a concurrent seminar. The placement site is determined through consultation and agreement among the student, the Field Education Coordinator or designate and the agency.

CROSSLISTED: SLWK 6416.015 and SLWK 6417.015  
FORMATS: Other (explain in comments)

### **SLWK 6416 SLWK Field Work Class**

CREDIT HOURS: 1.5

The field education course provides students with opportunities to integrate learning and practice through a supervised social work experience related to the specified learning goals. The course includes supervised social work practice in the field and a concurrent seminar for a total of 450 hours. The placement site is determined through consultation and agreement among the student, the Field Education Coordinator or designate and the agency. Please refer to the MSW Field Education Manual at (<http://www.dal.ca/faculty/healthprofessions/socialwork/programs/field-education.html>) for full details.

CALENDAR NOTES: Students who register in this course must register in SLWK 6417.03 for the winter term. Students taking this course must register in and complete SLWK 6416.03 and SLWK 6417.03 in consecutive terms; credit will not be granted if courses are not completed consecutively.

CROSSLISTED: SLWK 6415.03  
FORMATS: Other (explain in comments)

### **SLWK 6417 SLWK Field Work Class**

CREDIT HOURS: 1.5

The field education course provides students with opportunities to integrate learning and practice through a supervised social work experience related to the specified learning goals. The course includes supervised social work practice in the field and a concurrent seminar for a total of 450 hours. The placement site is determined through consultation and agreement among the student, the Field Education Coordinator or designate and the agency. Please refer to the MSW Field Education Manual at (<http://www.dal.ca/faculty/healthprofessions/socialwork/programs/field-education.html>) for full details.

CROSSLISTED: SLWK 6415.03



### **SLWK 6500 Interventions with Families**

CREDIT HOURS: 3

The purpose of the course is to provide students with an awareness of issues in conceptualizing families and their diversity, and opportunities to develop knowledge about, examine, and critique a range of interventions with families and their application in social work practice situations.

### **SLWK 6510 Women, Social Policy and Social Citizenship**

CREDIT HOURS: 3

The course examines the shifting terrain of women's social citizenship in Canada. An examination will be done of women's relationship to the Canadian welfare state, the nature of the new social policy regime and the impact that recent changes are having on women and gender equality.

FORMATS: Lecture | Discussion

### **SLWK 6520 Current Issues and Trends in Social Work Supervision**

CREDIT HOURS: 3

This course provides an opportunity to study the historical and current content of social work supervision. The relationship between social work theory and supervision methods will be examined from a critical perspective

### **SLWK 6530 HIV/AIDS and Social Work Practice**

CREDIT HOURS: 3

The course links social work practice to an examination of the biopsychosocial aspects of HIV/AIDS. Considering community and institutional responses to the epidemic, students will develop an understanding of the application of social work approaches and values to HIV/AIDS issues

### **SLWK 6540 Critical Approaches to Mental health and Addiction in Social Work Practice**

CREDIT HOURS: 3

This course will provide a critical approach to understanding mental health and addictions and the development of critical frameworks for social work practice and programming in these areas.

FORMATS: Lecture

### **SLWK 7002 Social Work Practice Research**

CREDIT HOURS: 3

This course will enhance students' understanding of the research process and accompanying skills. Qualitative and quantitative research techniques used in social work assessment will be reviewed including evaluative assessments, observational strategies, interviews, questionnaires, and standardized scales. The course explores ontological and epistemological queries of "doing research" and dynamics of ethics and power. Students will lead class discussions regarding various methodological tools and their own research design projects and proposals.

CALENDAR NOTES: Students taking this course must register in SLWK 7003 (the second half of the course) in the winter term. Students taking this course must register in and complete SLWK 7002.03 and SLWK 7003.03 in consecutive terms; credit will not be granted if courses are not completed consecutively.

CROSSLISTED: SLWK 7001.06

FORMATS: Lecture | Seminar

### **SLWK 7003 Social Work Practice Research**

CREDIT HOURS: 3

This course will enhance students' understanding of the research process and accompanying skills. Qualitative and quantitative research techniques used in social work assessment will be reviewed including evaluative assessments, observational strategies, interviews, questionnaires, and standardized scales. The course explores ontological and epistemological queries of "doing research" and dynamics of ethics and power. Students will lead class discussions regarding various methodological tools and their own research design projects and proposals.

CALENDAR NOTES: This course is the second half of SLWK 7002. Students taking this course must register in and complete SLWK 7002 and SLWK 7003 in consecutive terms; credit will not be granted if courses are not completed consecutively.

CROSSLISTED: SLWK 7001.06

FORMATS: Lecture | Seminar

### **SLWK 7400 Integrated Approaches for Social Work Practice**

CREDIT HOURS: 3

This course examines theory, policy, and direct intervention as interrelated forms of social work practice. Through this integrated approach, students explore politicized approaches to transformative social work by examining social welfare settings including health environments, child welfare, government, non-government, not-for-profit organizations, and social movements. Students will develop an intersectional lens and critical analysis of integrated approaches to practice in chosen areas of interests within diverse communities.

RESTRICTIONS: MSW

FORMATS: Lecture

### **SLWK 7410 Social Work in Health Systems**

CREDIT HOURS: 3

This course is to enable participants to enhance their understanding and practice abilities in diverse social work practice roles within the context of the health system through involving them in an examination and critique of theories and knowledge about health and health service delivery systems.

FORMATS: Lecture | Seminar

### **SLWK 9000 Master's Thesis**

CREDIT HOURS: 6

The thesis is a major research project undertaken independently but with guidance and supervision from your thesis committee. This option requires students extend their time in the program by at least 4-8 months full-time, or 12 months part-time. Thesis requirements follow the Faculty of Graduate Studies regulations.

RESTRICTIONS: MSW

## **Sociology and Social Anthropology**

Location:

Marion McCain Arts and Social Sciences Building

6135 University Avenue

PO BOX 15000

Halifax NS

B3H 4R2

Phone Number: (902) 494-6593

Fax Number: (902) 494-2897

Email Address: [SOSAGrad@dal.ca](mailto:SOSAGrad@dal.ca)

Website: [www.dal.ca/faculty/arts/sociology-social-anthropology.html](http://www.dal.ca/faculty/arts/sociology-social-anthropology.html)

## **Staff**

### **Dean**

**Leonard, M.** (902-494-2158)

### **Chair**

**DuBois, L.** (902 494-8860)

### **Undergraduate Coordinator**

**Guy, Jean Sebastien** (902 494-6759)

### **Graduate Coordinator**

**Martin, F.** (902 494-6750)

### **Professors Emeriti**

**Apostle, R. A.**, BA (Simon Fraser), MA, PhD (Calif)

**Barkow, J. H.**, BA (CUNY), MA, PhD (Chi)

**Binkley, M. E.**, BA, MA, PhD (Toronto)

**Butler, P. M.**, BA (Memorial), MA (UNB), PhD (Toronto)

**Clairmont, D. H.**, BA, MA (McMaster), PhD (Wash Univ)  
**Gardiner Barber, P. T.**, BA, MA (Auck), PhD (Toronto)

## **Professors**

**Cooper, A.**, BA (Toronto), MA (Ontario Institute for Studies in Education), PhD (Toronto)

## **Associate Professors**

**DuBois, L.**, BA (McGill), MA, PhD (New School)  
**Fitting, E.**, BA (Toronto), MA, PhD (New School)  
**Foster, K.**, BA (Hons) (Dalhousie), MA (Waterloo), PhD (Carleton)  
**Gambold, L.**, BA (Illinois), MA, PhD (UCLA)  
**Helland, C.**, BA, MA (Concordia), PhD (Toronto)  
**Martin, F.**, BA (Queen's), MA, PhD (Melbourne)  
**Noble, B.**, BA, MA, PhD (Alberta)  
**Oakley, R.**, BA (St. Mary's), MA, PhD (Toronto)  
**Radice, M.**, BA (Univ of Sussex), MA (Laval), PhD (INRS-UCS)  
**Whelan, E.**, BA (Winnipeg), MA (Queen's), PhD (Carleton)  
**Yoshida, Y.**, BA (Tsuda College), MA, PhD (McGill)

## **Assistant Professors**

**Bryan, T.**, BA, MA, PhD (York)  
**Eramian, L.**, BA, MA (Western), PhD (York)  
**Guy, J. -S.**, BA, MA (Laval), PhD (UQAM)  
**Halpin, M.**, BA (Calgary), MA (UBC), PhD (Univ. of Wisconsin-Madison)  
**Robinson, M.**, BA (St. Mary's), MA, PhD (Toronto)

## **Cross Appointed Professors**

**Asbridge, M.**, BA, MA, PhD (Toronto)  
**Beagan, B.**, BA, MA (Dal), PhD (UBC)  
**Bryan, C.**, BA (Univ. of Winnipeg), MA (McGill), PhD (Dal)  
**Graham, J.**, BA (Waterloo), MA (Victoria), PhD (Univ. de Montreal)  
**Rajack-Talley, T.**, BSc (Univ. Kentucky), MA, PhD (Univ. of the West Indies)  
**Waldron, I.**, BA (McGill), MA (Univ. London), PhD (Toronto)

## **Adjunct (FGS) Professors**

**Barkow, J. H.**, BA (CUNY), MA, PhD (Chi)  
**Binkley, M. E.**, BA, MA, PhD (Toronto)  
**Butler, P. M.**, BA (Memorial), MA (UNB), PhD (Toronto)  
**Clairmont, D. H.**, BA, MA (McMaster), PhD (Wash Univ)  
**Clement, D.**, BA (Queen's), MA (UBC), PhD (Memorial)  
**Gamberg, H. V.**, BA (Brandeis), MA, PhD (Princeton)  
**Grieve, G.**, BA (San Francisco State), MA/PhD (University of Chicago)  
**Hetherington, K.**, BA (Concordia), MA (Dalhousie)  
**Khasnabish, A.**, BA, MA, PhD (McMaster)  
**Looker, D.**, BA (Carleton), MA (Waterloo), PhD (McMaster)  
**Ramos, H.**, BA (Yorke), MA, PhD (McGill)  
**Schmidt, J.**, BA (Lethbridge), MA (McGill), PhD (Western)  
**Soucy, A.**, BA (Concordia), MA (Concordia), PhD (ANU)  
**Tastsoglou, E.**, LLB (Kapodistrian), MA/PhD (Boston), LLM (Dalhousie)

## **Adjunct (Retired) Professor**

**Murphy, C. J.**, BA (St. FX), MA (Dalhousie), PhD (Toronto)

# **Admission Requirements**

The Department of Sociology and Social Anthropology offers programs leading to the MA in Sociology, the MA in Social Anthropology, the PhD in Sociology, and Social Anthropology.

All candidates who are applying to the MA program in Sociology or Social Anthropology must satisfy the general requirements for admission to the Faculty of Graduate Studies. Candidates will normally be expected to hold a four-year degree in Sociology or Social Anthropology with at least an upper second course (A-) standing. It is expected that a candidate's undergraduate work will have included courses in theory and methods appropriate to the particular discipline. Promising applicants who fail to meet these requirements may be admitted to a qualifying year which, if successfully completed, would permit subsequent enrollment in the MA program.

All candidates who are applying for the PhD in Sociology or Social Anthropology must hold an MA in Sociology, Anthropology or its equivalent. Applicants must have a graduate academic record of at least A-. Priority for acceptance to the PhD program will be given to students whose areas of interest coincide with the Department's major areas of concentration.

Our department admits once a year for a September start. We recommend that students submit their application by December 15th if they wish to be considered for scholarships granted through Dalhousie University's Harmonized Scholarship Process and/or if they are an international student. Otherwise, students should apply by January 15th. Students who apply after January 15th may be considered for admission, but only if space is available.

## Master of Arts (MA)

A full-time MA program is normally of one year's duration, its upper time limit (in accordance with [Faculty of Graduate Studies Regulations](#)) being four years. A part-time option is also available, its upper time limit (in accordance with Faculty of Graduate Studies regulations) being five years.

The program is made up of 30 credit hours. SOSA 9000.00/SOSA 9001.00: MA Thesis, worth 12 credit hours, is required as are the following courses: SOSA 5200.06: Master's Seminar in Sociology and Social Anthropology and SOSA 5300.06: Area Examination which students must register for in the fall and winter term. An elective course (or two 3 credit hour courses) approved by the Graduate Education Committee constitute the final credit hours.

An examination in the student's chosen area of specialization as well as defense of a thesis proposal are required

## Doctor of Philosophy (PhD)

In accordance with the Faculty of Graduate Studies regulations, the program has a two-year residency requirement. It is expected that the program will take approximately four years to complete.

The first year is intended to strengthen the student's foundational knowledge in the discipline by broadening its base while filling in any gaps and deepening the student's understanding of specific areas of the discipline. Under the guidance of the student's Supervisor and Program Committee, the student shall register for 18 credit hours for the first year: the PhD Seminar (SOSA 5600.03), which runs in the fall term; and 15 credit hours of electives, which normally consists of a combination of formal classes and of reading classes. The student will also complete any additional graduate courses, internal or external to the Department, that the student's Committee deems necessary.

By the end of the second academic year the student must have written three interrelated comprehensive exams in theory, in methods and in a substantive area. The student is required to pass all three comprehensive exams in order to continue in the PhD program. During this year, or the following, the student is required to make a presentation to a departmental colloquium on a topic that normally will be related to the research proposal. The latter must also be completed and approved by the Advisory Committee by the end of the second year.

For the third (and any subsequent) years the student will register for "thesis only" credit. By the end of the third year, the student must demonstrate a working knowledge of a language other than English which is relevant to the student's studies and research. If a student does not have an approved doctoral thesis proposal within three calendar years after acceptance into the program, the student will not be permitted to continue in the program. In accordance with Faculty regulations, an oral defense of the thesis is required.

# Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### **SOSA 5001 Quantitative Analysis for the Social Sciences I**

CREDIT HOURS: 3

This course will introduce quantitative analysis. It will engage issues of research design, the relationship between samples and populations, statistics, and inference, as well as basic tests of statistical significance. The course will also introduce tabular, graphical, and bi-variate linear analysis, using computer software. It will encourage secondary data analysis of available datasets, evaluation of surveys, and develop skills through a series of class projects.

CROSSLISTED: SOSA 4001.03

EXCLUSIONS: SOSA 3115.03

FORMATS: Seminar

### **SOSA 5002 Quantitative Analysis for the Social Sciences II**

CREDIT HOURS: 3

This course will focus on the use of quantitative methods in social science research. It will introduce students to regression techniques and concentrate on the assumptions motivating quantitative analysis. The course will also look at regression diagnostics and critically weigh options available to researchers when "normal" assumptions are broken. The course will be split into lectures and computer labs using statistical software. The labs will apply methods covered in class and explore potential secondary data resources. The course will develop these skills through a series of class projects.

CROSSLISTED: SOSA 4002.03

FORMATS: Seminar

### **SOSA 5003 Contemporary Perspectives in Ethnography**

CREDIT HOURS: 3

Ethnographies and critical writings which grapple with questions of theory and interpretation in a range of contexts-near and far, familiar, and strange, local and global - will be examined in this course.

FORMATS: Seminar

### **SOSA 5004 Advanced Issues in Economy, Work and Development**

CREDIT HOURS: 3

Each year, this "advanced issues" course focuses on a different specific topic within the general area. In past years topics have addressed the social and cultural aspects of changing livelihoods and patterns of work associated with globalization. The approach is typically comparative and considers different regional, national, and international contexts. Consult Department for the specific topic.

FORMATS: Seminar

### **SOSA 5005 Advanced Issues in Social Justice and Inequality**

CREDIT HOURS: 3

Each year, this "advanced issues" course focuses on a different specific topic within the general area. In past years topics have addressed social and moral problems of social inequalities of various kinds viewed in a context of global changes. Sample topics include but are not restricted to gender, minority and class inequalities; struggles over rights; social movements; social scenarios surrounding citizenship, migration and immigration; multiculturalism; and border and security studies. Consult Department for specific topic.

FORMATS: Seminar

### **SOSA 5006 Advanced Issues in Critical Health Studies**

CREDIT HOURS: 3

Each year, this “advanced issues” course focuses on a different specific topic within the general area. In past years topics have addressed how health is socially and culturally constructed, the differential social and cultural effects of health knowledges and power relationships, and how various perspectives on health are challenged from within and beyond the health professions. Consult Department for the specific topic.

FORMATS: Seminar

### **SOSA 5011 Advanced Issues in Social Theory**

CREDIT HOURS: 3

This seminar consists of an intensive examination of one or more selected bodies of theory and makes links between theory and current trends in research in sociology and/or social anthropology.

FORMATS: Seminar

### **SOSA 5012 Special Topics in Sociology and Social Anthropology**

CREDIT HOURS: 3

This seminar consists of an intensive examination of a selected substantive issue within Sociology and Anthropology. Since the specific topic or research problem which receives special treatment will differ from year to year, students are advised to consult the department prior to registration.

FORMATS: Seminar

### **SOSA 5200 Master's Seminar in Sociology and Social Anthropology**

CREDIT HOURS: 6

The main goal of this course is graduate student cohort-building, instruction on research design and method Selection (with dedicated classes on topics such as developing research questions, conducting literature searches and reviews, entering the field, analyzing qualitative and quantitative data, and research ethics), guidance on the requirements of the programs (including area essay's, comprehensive exams, and thesis proposals), and professional Development (with dedicated classes on topics such as conferencing, publishing, and academic and non-academic jobs). The second term will involve working towards producing a preliminary proposal for the Master's Thesis

FORMATS: Seminar

### **SOSA 5300 Area Examination**

CREDIT HOURS: 6

The Area Examination is an examination in some designated area of Sociology or of Social Anthropology. The area itself is based on a reading list developed by the student's Program Committee in consultation with the student.

### **SOSA 5510 Graduate Readings in Sociology and Social Anthropology**

CREDIT HOURS: 3

In a reading course, the student is assigned to a member or staff or regular meetings to discuss in a selected area. Papers and research projects are expected.

### **SOSA 5520 Graduate Readings in Sociology and Social Anthropology**

CREDIT HOURS: 3

In a reading course the student is assigned to a member or staff or regular meetings to discuss in a selected area. Papers and research projects are expected.

### **SOSA 5600 PhD Seminar in Sociology and Social Anthropology**

CREDIT HOURS: 3

The main goal of this course is graduate student cohort-building, instruction on research design and method selection (with dedicated classes on topics such as developing research questions, conducting literature searches and reviews, entering the field, analyzing qualitative and quantitative data, and research ethics), guidance on the requirements of the program (including area essays, comprehensive exams, and thesis proposals), and professional development (with dedicated classes on topics such as conferencing, publishing, and academic and non-academic jobs).

FORMATS: Seminar

### **SOSA 6003 Contemporary Perspectives in Ethnography II**

CREDIT HOURS: 3

Ethnographies and critical writings which grapple with questions of theory and interpretation in a range of contexts-near and far, familiar, and strange, local and global - will be examined in this course.

RESTRICTIONS: Restricted to SOSA graduate students

FORMATS: Seminar

### **SOSA 6004 Advanced Issues in Economy, Work and Development II**

CREDIT HOURS: 3

Each year, this “advanced issues” course focuses on a different specific topic within the general area. In past years topics have addressed the social and cultural aspects of changing livelihoods and patterns of work associated with globalization. The approach is typically comparative and considers different regional, national, and international contexts. Consult Department for the specific topic.

RESTRICTIONS: Restricted to SOSA graduate students

FORMATS: Seminar

### **SOSA 6005 Advanced Issues in Social Justice and Inequality II**

CREDIT HOURS: 3

Each year, this “advanced issues” course focuses on a different specific topic within the general area. In past years topics have addressed social and moral problems of social inequalities of various kinds viewed in a context of global changes. Sample topics include but are not restricted to: gender, minority and class inequalities; struggles over rights; social movements; social scenarios surrounding citizenship, migration and immigration; multiculturalism; and border and security studies. Consult Department for specific topic.

RESTRICTIONS: Restricted to SOSA graduate students

FORMATS: Seminar

### **SOSA 6006 Advanced Issues in Critical Health Studies II**

CREDIT HOURS: 3

Each year, this “advanced issues” course focuses on a different specific topic within the general area. In past years topics have addressed how health is socially and culturally constructed, the differential social and cultural effects of health knowledges and power relationships, and how various perspectives on health are challenged from within and beyond the health professions. Consult Department for the specific topic.

RESTRICTIONS: Restricted to SOSA graduate students

FORMATS: Seminar

### **SOSA 9000 MA Thesis - SOCI**

CREDIT HOURS: 0

### **SOSA 9001 MA Thesis - SOAN**

CREDIT HOURS: 0

### **SOSA 9530 PhD Thesis**

CREDIT HOURS: 0

## **Statistics**

Location:

Chase Building

6316 Coburg Road

PO BOX 15000

Halifax NS  
B3H 4R2

Phone Number: (902) 494-2572  
Fax Number: (902) 494-5130  
Email Address: [statgc@mathstat.dal.ca](mailto:statgc@mathstat.dal.ca)  
Website: [www.mathstat.dal.ca](http://www.mathstat.dal.ca)

## Introduction

The department offers programs leading to the degrees of MSc and PhD in the following areas: statistical inference, robust statistics, data mining, bioinformatics, data analysis, multivariate analysis, linear and nonlinear regression, time series analysis, statistical genetics, environmental statistics, information theory and ecological statistics.

## Staff

### Chair of the Department

**Janssen, J.C.M.**, MSc (Eindhoven), PhD (Lehigh)

### Director of Division

**Dowd, M.**, MBA, MES, PhD (Dalhousie)

### Graduate Coordinator

**Mills Flemming, J. E.**, MSc (TUNS), PhD (Dalhousie)

### Professors

**Bielawski, J. P.**, MA (Hofstra), PhD (Texas A & M Univ), joint appointment with Biology

**Dowd, M.**, MES, PhD (Dalhousie)

**Gu, H.**, MSc (Peking), PhD (Hong Kong)

**Mills Flemming, J. R.**, MSc (TUNS), PhD (Dalhousie)

**Smith, B.**, MSc (Calgary), PhD (Berkeley)

**Susko, E. A.**, MSc (UBC), PhD (Waterloo)

### Associate Professors

**Kenney, T.**, BA (Hons), MMath, PhD (Cambridge)

### Assistant Professors

**Ho, L.**, PhD (Univ. of Wisconsin)

### University Teaching Fellows

**Sarhan, A.**, PhD (Gdansk)

Please refer to the entry for the Department of Mathematics and Statistics in this calendar for a full listing of the members of the Department and information on other programs offered by the Department.

## Admission Requirements

Candidates must satisfy the general requirements for admission to the Faculty of Graduate Studies.

Candidates will normally be expected to hold a degree recognized by Dalhousie University as the equivalent of a Bachelor's degree with Honours in one of its own faculties.

TOEFL scores are required for applicants whose native language is not English. Valid score reports must be received directly from the Educational Testing Service. To ensure consideration for scholarship funds, application should be made by December 15.



# Master of Science (MSc)

## Requirements

1. At least 18 credit hours, at the graduate level to be chosen in consultation with the graduate coordinator or their supervisor. In addition, students whose preparation is deficient will be required to complete appropriate courses which will be designated by the adviser.
2. Attendance and participation in seminars.
3. A satisfactory thesis.
4. Students are required to give an oral presentation of their thesis and at that time to answer questions about the thesis. This presentation will be made after the thesis is in the hands of the student's committee and will be taken into account when the committee makes its decision.

# Doctor of Philosophy (PhD)

## Requirements

NOTE: The minimum and maximum time required to complete this program are set out in Section 1.3.2 and 6.1 in the [Faculty of Graduate Studies regulations](#).

1. At least 12 credit hours chosen in consultation with the graduate coordinator or their supervisor.
2. Attendance and participation in seminars.
3. Candidates must write and orally defend a thesis proposal within 18 months of commencement of their PhD program.
4. Preparation and defence of a satisfactory research thesis.

## Courses

Below you will find descriptions for courses offered in this field of study. You will find a general overview of the topics covered and any prerequisite course(s) or grade requirements, credit value and exclusions.

Some courses are listed as exclusionary to one another. This means that students may not take both courses as designated.

Not all courses are offered each year. Please consult the current [timetable](#) for this year's offering. For further information please contact the department.

## Course Descriptions

### STAT 5001 AARMS Summer Course I

CREDIT HOURS: 3

This course is to be offered by and completed at an AARMS Summer School hosted at an Atlantic University. To register you must have permission from the Graduate Coordinator.

FORMATS: Lecture

### STAT 5002 AARMS Summer Course II

CREDIT HOURS: 3

This course is to be offered by and completed at an AARMS Summer School hosted at an Atlantic University. To register you must have permission from the Graduate Coordinator.

FORMATS: Lecture

### STAT 5066 Advanced Statistical Theory I

CREDIT HOURS: 3

This course, together with STAT 5067.03 provides a solid basis in the theory of statistical inference. After a review of some probability and distribution

theory, the Bayesian and classical theories of estimation and testing are introduced.

CROSSLISTED: MATH 4066.03/5066.03, STAT 4066.03

### **STAT 5067 Advanced Statistical Theory II**

CREDIT HOURS: 3

This course builds upon the material of Statistics 4066/5066. After a review of probability theory, statistical theory for the major methods of estimation will be rigorously developed. Topics include statistical consistency, limiting distributions of estimators, limiting distributions for testing in likelihood settings and transformations of confidence regions. Asymptotic optimality for point estimation, testing and confidence regions will be defined, and optimality results will be established for likelihood methods. Laplace approximation will be used to investigate the properties of Bayesian methods and to derive the BIC model selection criterion.

PREREQUISITES: STAT 5066

CROSSLISTED: MATH 5067.03

FORMATS: Lecture

### **STAT 5070 Multivariate Distributions**

CREDIT HOURS: 3

This course deals with the distribution theory of the observations on more than one variable. Topics covered include: the multivariate normal distribution, the Wishart distribution, Hotelling's  $T$ , distributions associated with regression, canonical correlations, and discriminant analysis.

PREREQUISITES: STAT 3460.03

FORMATS: Lecture

### **STAT 5090 Probability**

CREDIT HOURS: 3

A mathematically rigorous treatment of probability theory in Euclidean space. Topics include measure and integration, probability measures, the definitions and properties of random variables and distribution functions, convergence concepts, Borel-Cantelli lemmas, laws of large numbers, characteristic functions and central limit theorems, conditional probability, and expectation. Although the necessary measure theory is introduced, a previous analysis course is an asset.

PREREQUISITES: STAT 3360.03 and a third-year analysis course, instructor's consent

CROSSLISTED: MATH 4090.03/5090.03, STAT 4090.03

FORMATS: Lecture

### **STAT 5100 Survival Analysis**

CREDIT HOURS: 3

This course is an introduction to survival analysis methods and will cover both the statistical theory behind the methods, and the application of various techniques. Topics to be discussed include survivorship and hazard functions and their relationship to lifetime distributions and densities; modes of censoring; the Kaplan-Meier estimate of the new survivor function; parametric survival time distributions; proportional hazard models and their semi-parametric estimation; accelerated life models, log rank tests, including the Mantel-Haenszel test; and goodness of fit measures.

PREREQUISITES: STAT 3340.03 and STAT 3460.03, or equivalent

CROSSLISTED: STAT 4100.03

FORMATS: Lecture

### **STAT 5130 Bayesian Data Analysis**

CREDIT HOURS: 3

Stat 5130 is intended to make advanced Bayesian methods genuinely accessible to graduate students. The course covers all the fundamental concepts of Bayesian methods, and works from the simplest ideas (characterizations of probability; comparative inference; prior, posterior, and predictive distributions) up through hierarchical models applied to various data. Computational methods include MCMC for posterior simulation.

PREREQUISITES: STAT 3360.03 and STAT 3460.03

CROSSLISTED: STAT 4130.03

EXCLUSIONS: STAT 4130.03

FORMATS: Lecture

### **STAT 5300 Topics in Statistics and Probability**

CREDIT HOURS: 3

### **STAT 5350 Applied Multivariate Analysis**

CREDIT HOURS: 3

This course deals with the stochastic behaviour of several variables in systems where their interdependence is the object of analysis. Greater emphasis is placed on a practical application than on mathematical refinement. Topics include classification, cluster analysis, categorized data, analysis of interdependence, structural simplification by transformation or modelling and hypothesis construction and testing.

PREREQUISITES: STAT 3340.03 and MATH 2135.03 or 2040.03

CROSSLISTED: STAT 4350.03

FORMATS: Lecture

### **STAT 5360 Robust Statistics**

CREDIT HOURS: 3

Robust statistics are those which provide protection against violation of assumptions underlying the statistical procedure. We will develop basic concepts including sensitivity, influence and breakdown of estimates and tests. Classical procedures will be evaluated in terms of robustness and alternate techniques developed based on weighted least squares and/or median based generalizations. Starting from the location problem, we will move on to regression and to multivariate problems by means of robust covariance estimates. We will also consider robust techniques in time series. Some simple programming will be required to implement various procedures.

PREREQUISITES: STAT 3460.03 and 3340.03

CROSSLISTED: STAT 4360.03

FORMATS: Lecture

### **STAT 5370 Stochastic Processes**

CREDIT HOURS: 3

The theory and application of stochastic processes. Topics to be discussed include the Poisson process, renewal theory, discrete and continuous time Markov processes, and Brownian motion. Applications will be taken from the biological and physical sciences, and queuing theory.

PREREQUISITES: STAT 3360.03 or instructor's consent

CROSSLISTED: STAT 4370.03

FORMATS: Lecture

### **STAT 5390 Time Series Analysis I**

CREDIT HOURS: 3

Time series analysis in both the time and frequency domain is introduced. The course is applied, and students are required to develop their own computer programs in the analysis of time series drawn from real problems. Topics to be discussed include the nature of time series, stationarity, auto and cross covariance functions, the Box-Jenkins approach to model identification and fitting, power and cross spectra and the analysis of linear time-invariant relationships between pairs of series.

PREREQUISITES: Instructor's consent

CROSSLISTED: OCEA 5210.03

EXCLUSIONS: OCEA 4210.03, STAT 4390.03

FORMATS: Lecture

### **STAT 5410 Advanced Topics in Time Series Analysis**

CREDIT HOURS: 3

### **STAT 5500 Topics in Advanced Statistics**

CREDIT HOURS: 3

### **STAT 5550 Longitudinal Data Analysis**

CREDIT HOURS: 3

This course is concerned with statistical techniques for analysis of longitudinal data, data that are collected repeatedly over a time on a number of subjects. Topics include generalized estimating equations; fixed, random, and mixed effects linear models; generalized linear models; diagnostics and model checking; as well as missing data issues.

PREREQUISITES: STAT 4620/5620 OR permission of instructor

FORMATS: Lecture

### **STAT 5570 Statistical Genetics**

CREDIT HOURS: 3

This course discusses the use of statistics in genetics. Following an introduction to genetics, statistical methodology related to genetic data will be covered. Such data arises in measuring population structure and distance, finding disease susceptibility loci, detecting genes related to quantitative traits, constructing phylogenetic trees, and from microarrays.

PREREQUISITES: Permission of instructor

CROSSLISTED: STAT 4570.03

FORMATS: Lecture

### **STAT 5620 Data Analysis**

CREDIT HOURS: 3

A variety of statistical models which are useful for the analysis of real data are discussed. Topics may include: generalized linear models, such as logistic regression and Poisson regression, models for multidimensional contingency tables, ordered categories and survival data.

PREREQUISITES: STAT 3340.03, 3460.03, or instructor's consent

CROSSLISTED: STAT 4620.03

FORMATS: Lecture

### **STAT 5630 Statistical Methods in Molecular Evolution**

CREDIT HOURS: 3

This course will cover the common data types, models, and estimation and inferential methods in Molecular Evolution. The non-standard nature of the data and parameter space make this a usual statistical problem. Topics include distance methods, maximum likelihood, and confidence regions for trees.

PREREQUISITES: STAT 3460 or instructor's consent

### **STAT 5750 Statistical Data Mining**

CREDIT HOURS: 3

This course covers statistical methodology, major software, and applications in data mining. A variety of supervised learning and unsupervised learning methods will be discussed. Topics include: Linear methods for regression and classification, prototype methods, decision trees, additive models, bagging and boosting, neural networks and support vector machines.

PREREQUISITES: Permission of instructor

FORMATS: Lecture

### **STAT 7320 Statistics Seminar**

CREDIT HOURS: 0

### **STAT 8891 Co-Op Work Term I**

CREDIT HOURS: 0

### **STAT 8894 Co-Op Work Term IV**

CREDIT HOURS: 0

**STAT 9000 Master's Thesis**  
CREDIT HOURS: 0

**STAT 9500 Thesis Proposal**  
CREDIT HOURS: 0

As part of PhD requirements, within 12 months of successful completion of comprehensive exams, students must submit a written document to thesis committee members as a PhD proposal. This proposal will summarize the relevant literature related to their proposed thesis research topic. It should also outline a plan for successful completion of the project. The proposal needs to be defended orally approximately one week after submission.

**STAT 9530 Doctoral Thesis**  
CREDIT HOURS: 0

## **Centres and Institutes**

### **Introduction**

A number of centres and institutes for study and research in specific fields are based at the University. These are:

### **Atlantic Institute of Criminology**

Director: D.H. Clairmont, BA, MA, PhD

The Atlantic Institute of Criminology (AIC) is a research institute that is heavily policy-oriented in the field of crime and the criminal justice system. Its mandate is to foster the exchange of information among researchers and policy makers in those areas. Consultative services are provided to fellow scholars and researchers, including graduate students, and visiting professors, with respect to the planning and execution of research projects and related undertakings. The AIC is an entity that itself conducts extensive research in criminology, especially with respect to policing, the administration of justice, youth justice issues, race, ethnic and equity issues in justice. It has produced a significant body of policy-oriented research on Aboriginal and African-Canadian justice issues. The AIC Dalhousie website (Dalhousie - SOSA-AIC), which is regularly updated, provides a clear indication of the research products of recent years even though the website is largely restricted to research output that does not include articles in professional journals or edited books available elsewhere.

### **Atlantic Research Centre (ARC)**

Director: Neale Ridgway

Phone: (902) 494-7133

Website: <http://arc.medicine.dal.ca/>

Established in 1967, the ARC conducts basic biomedical research in the fields of lipid metabolism and cell signalling, areas of fundamental importance to a variety of disorders including cancer, neurological, heart and infectious diseases. It also provides education and expertise in these fields to undergraduate and graduate students, other researchers, and the general public. The ARC houses state-of-the-art facilities for biochemical and molecular biological research. The Centre's staff hold appointments in the Departments of Pediatrics and Biochemistry and Molecular Biology in the Faculty of Medicine. Research at the ARC is supported by

agencies such as the CIHR, NSERC, CFI, Heart and Stroke Foundation, National Cancer Institute, Atlantic Innovation Fund, and the IWK Health Centre.

## Beatrice Hunter Cancer Research Institute

Director: Dr. Gerry Johnston  
Administrative Director: Cindy Pettipas  
Telephone: 902 494-4513  
Fax: 902 494-8472  
Email: [cpettipas@dal.ca](mailto:cpettipas@dal.ca)  
Website: [www.bhcri.ca](http://www.bhcri.ca)

In 1999, Beatrice Hunter bequeathed \$12.5 million to the Dalhousie Medical Research Foundation for cancer research, in memory of her parents, Dr. Owen and Mrs. Pearle Cameron. The bequest was placed in the Cameron Endowment Fund, with the annual earnings supporting cancer research at Dalhousie Faculty of Medicine. Early on, Beatrice Hunter's generosity sparked the creation of the Dalhousie Cancer Research Program (DCRP) that united key players within charitable, University and government sectors to create and support a thriving cancer research community. Over a short period of time, talented researchers and trainees were recruited to the region and collectively now secure millions of dollars of cancer research funding from outside granting agencies.

In 2009, the DCRP and its funding partners took the next bold step to become the Beatrice Hunter Cancer Research Institute (BHCRI), which was created to foster a more powerful, productive, and collaborative cancer research environment throughout Atlantic Canada. The Institute provides regular workshops, lectures and symposia that serve as a common forum for researchers to share ideas and forge new collaborations within Atlantic Canada and beyond. The Institute also provides a key entry point for members of the public who want to learn more about cancer research in the region. The Institute represents the major resource within our region for those seeking training and careers in cancer research as well as those interested in supporting cancer research. The BHCRI has over 300 active members (both principal investigators and trainees at all career stages) throughout Atlantic Canada. BHCRI is supported by advisory committees populated by cancer experts and informed members of the public that provide advice on all aspects of cancer research and training. BHCRI receives financial support from a broad range of local and national organizations and the Institute takes responsibility for allocation of financial resources that support all aspects of cancer research and training, with funds allocated through peer-review processes that meet international standards.

Researchers within the Beatrice Hunter Cancer Research Institute share a collective vision and work toward the same goal: to save lives and ease the burden of cancer on individuals, families and society. Even though our funding comes from many sources, all of this funding stays in Atlantic Canada to build and support cancer research within our own region.

The Beatrice Hunter Cancer Research Institute was approved as an institution by Dalhousie on November 29, 2017.

## Brain Repair Centre

Chair: Dr. Victor Rafuse, Director  
Website: <http://www.brainrepair.ca/>

The Brain Repair Centre (BRC) is a collaboration of Dalhousie University, the Capital District Health Authority and the IWK Health Centre. The BRC is a multi-disciplinary unit focusing on research that can lead to the diagnosis, treatment, and repair of the brain to overcome the effects of neurological and psychiatric disorders such as Parkinson's disease, Huntington's disease, Amyotrophic Lateral Sclerosis (ALS), Epilepsy, Muscular Sclerosis (MS), stroke and spinal cord injury. The BRC grew out of the clinical Neural Transplantation Program, collaboration between basic neuroscientists and clinicians interested in treating Parkinson's disease. The success of the Neural Transplantation Program led clinical and basic neuroscientists to decide to form the Brain Repair Centre. The BRC was formed in 1999 and has focused on stem cell transplantation, Parkinson's disease, spinal cord injury, psychotic disorders, stroke, and neuroimaging as areas of innovation at Dalhousie University, Capital Health and the IWK Health Centre.

Examples of BRC achievements include:

- Attracted capital funding from private donors, institutions, and the public sector to support construction and fit-up of the new Life Sciences Research Institute. When the LSRI is completed, the Brain Repair Centre will become the anchor tenant of this new research and commercialization building with state-of-the-art research, equipment and facilities.

- Establishment of collaboration agreements with research teams at McLean Hospital/Harvard University; Jilin University, China; Cardiff University, Wales; and Neurodyn, Inc.
- Establishment of a \$12 million magnetic resonance imaging facility with the national Research council's Institute for Biodiagnostics (NRC-IBD).
- In 2006, the BRC was awarded \$5.5 million for infrastructure from the Canadian Foundation for Innovation, the largest such award to date in Atlantic Canada. Also in 2006, BRC received a \$3 million Atlantic Innovation Fund award for research, a follow-on to an earlier \$3 million research award.
- Dr. David Clarke, a member of the Brain Repair Centre used a virtual model of a patient's brain to remove a simulated brain tumour before removing the actual tumour the following morning. Developed by a partnership of the National Research Council and a team of about 50 people in 10 Centres across Canada, this was the first such surgery performed in the world.
- Medtronic Canada, Capital District Health Authority, QEII Foundation, and the Brain Repair Centre established a Canadian Centre of Excellence and Training at the Halifax Infirmary. This new \$3.5 million centre provides important new clinical facilities for training and development in imaging, spinal cord and neuromodulation.
- In the neurotransplantation field, the BRC is unique in Canada and one of only four centres worldwide involved in clinical application of neural transplantation, with the "Halifax Protocol" accepted as the world gold standard.
- The BRC is an innovative collaboration that integrates its research expertise with pioneers in the fields of imaging, neurology, stem cell neurobiology, vision, molecular neurobiology, pharmacology, psychiatry, clinical trials and cognitive neuroscience.
- The BRC brings together the expanding fields of neuroimaging and stem cell technologies with application to the treatment of neurological and psychiatric disorders.
- The BRC is the Atlantic Canada presence in the Stem Cell Network, a National Centre of Excellence in stem cell research.

The BRC places emphasis on moving basic science research from the bench to the clinical bedside and from the bedside back to the bench. A key objective of the BRC is to produce innovative technologies that will be commercialized.

## Canadian Center for Vaccinology

Director: Scott Halperin, MD  
 Associate Directors: Robert Anderson, MD  
 Joanne Langley, MD  
 Janice Graham, PhD

Website: [www.centerforvaccinology.ca](http://www.centerforvaccinology.ca)

Email: [ccfv@iwk.nshealth.ca](mailto:ccfv@iwk.nshealth.ca)

Facebook: CCfVhfx  
 Twitter: @VACCres  
 Phone: 902 470-8141  
 Fax: 902 470-7232

### Vision

CCfV is an integrated collaborative multidisciplinary vaccine research team committed to excellent research. CCfV unites the biomedical and clinical sciences with the social sciences and humanities to effectively span the research continuum from basic discovery to translation into useful vaccines to prevent disease in humans and to change population and public health outcomes.

### Organization

Activity within CCfV is organized into three groups

- Vaccine Discovery Group

- Vaccine Evaluation Group
- Health Policy & Translation Group

An **Advisory Committee** of CCFV investigators and external advisors provides counsel on the strategic direction and objectives of CCFV research.

## Members

Anyone with an interest in vaccine-related research may apply for membership at <http://www.centerforvaccinology.ca/about-ccfv/join-us/>

For a list of current members go to <http://www.centerforvaccinology.ca/about-ccfv/members/>

CCFV is made possible by a continuing collaboration of Dalhousie University, the IWK Health Centre, and Capital Health. The CCFV's 20,000 square foot facility in the IWK Health Centre includes laboratories for microbiological and molecular research, ambulatory and inpatient clinical trial facilities, data analysis, training and conference space. It was founded in 2007 with financial assistance from the Canada Foundation for Innovation, the Nova Scotia Research and Innovation Trust, and the Government of Nova Scotia's Department of Economic Development, among others. The Clinical Research/Vaccine Challenge Unit, which opened in 2009, was made possible by additional funding from Sanofi Pasteur.

## Canadian Institute of Fisheries Technology (CIFT)

Director: A. T. Paulson, PhD

Phone: (902) 494-3280

Fax: (902) 420-0219

Website: <http://cift.engineering.dal.ca>

CIFT was established in 1979 at the former Nova Scotia Technical College (later TUNS). The federal Department of Fisheries and Oceans provided much of its early specialized laboratory and seafood pilot scale processing equipment, and Industry Canada provided start-up funding and designated CIFT a centre of excellence. As a government-approved laboratory for advanced technology, it also provides R&D services on a cost-recovery basis to industry and to various governmental agencies. The Institute promotes technology transfer and the development of advanced technologies aimed at more effective commercial utilization of both marine and terrestrial resources in Canada and throughout the world.

In addition, CIFT offers unique opportunities for post-graduate training and research through the Food Science program. Major areas of emphasis are: food biochemistry and microbiology; fats, oils, nutraceuticals and other bioactives; physical properties of foods; fish/food process engineering; food safety and preservation; food rheology, food fermentation and beverage science.

### Facilities

CIFT is located in the MacDonald Building of Sexton Campus at 1360 Barrington Street in downtown Halifax. The Institute's facilities include:

- fats and oils laboratory
- food chemistry laboratory
- food development laboratory
- sensory evaluation laboratory
- food process engineering pilot plant
- low temperature storage facility
- food physical properties laboratory
- food microbiology laboratory

These areas contain specialized instrumentation and food processing equipment to enable experimental processing, laboratory analysis, and product storage evaluation. In addition to a computer-controlled cold-storage facility, the pilot plant is equipped for experimental processing including freezing, chilling, thermal processing, drying, centrifugal separation, and meat-bone separation.



The pilot plant is well equipped for thermal processing with an automated retort capable of steam, steam-air, or water immersion processing research. The specially designed cold-storage facility is computer controlled and particularly useful for the study of changes in foods as a result of frozen storage history. The pilot plant is also equipped with a custom-built computer-controlled heat pump dryer that is used in food dehydration experiments.

Specialized laboratory equipment includes: automated high performance and fast protein liquid chromatography systems, gas chromatography/mass spectroscopy system, preparative ultracentrifuge, multi-purpose refrigerated centrifuge, microtube centrifuge, analytical and preparative electrophoretic/isoelectric focusing equipment, pulsed field electrophoresis system, thermocycler, DNA gel electrophoresis, Hoefer Daltsix for 2D eletrophoresis, Image Master 2D elite software, capillary electrophoresis system, ultra-low temperature freezer, universal texture testing machine, various colorimeters, U.V. and visible spectrophotometer, spectrofluorometer, electrokinetic analyzer, workstation for mathematical modelling and computer simulation, Linkham shearing stage/microscope, Nikon microscope (various attachments), controlled stress rheometer with a high temperature/pressure attachment, controlled rate rheometer, Viscomat, and a rolling ball viscometer.

#### **Educational Opportunities**

Graduate (MSc and PhD) programs are available through the Food Science and Technology program. Also, post-doctoral research opportunities are offered. Graduate level class work and research opportunities relate to food science, seafood processing technology, marine oils, engineering design, packaging technology, fish post-mortem biochemistry, food microbiology, food rheology and food process science. Students with degrees in food science, engineering, chemistry/biochemistry, microbiology, or biology are invited to apply.

## **Centre for African Studies**

Phone: (902) 494-3814/494-1377

Fax: (902) 494-2105

Director: Theresa Ulicki, PhD

The mandate for this Centre is under review.

This centre, established in 1975, advances instruction, publication, research, and development education programs in African Studies. Associated faculty offer classes through the Departments History, International Development Studies, Political Science, French, Sociology and Social Anthropology and Philosophy. The Centre organizes academic and informal seminars and public policy conferences on Africa and encourages interdisciplinary interaction at all levels on African subjects and issues. It co-operates with the International Development Studies department and with the International Research and Development office.

## **Centre for Comparative Genomics and Evolutionary Bioinformatics (CGEB)**

Director: Andrew J. Roger, PhD

Coordinator: Wanda Danilchuk

Phone: (902) 494-2620

Fax: (902) 494-1355

Website: <http://www.cgeb.dal.ca>

The Centre for Comparative Genomics and Evolutionary Bioinformatics (CGEB) at Dalhousie University encompasses an interdisciplinary group of researchers in the Faculties of Medicine, Science and Computer Science. Although microbial genome evolution and diversity is at the heart of many of the CGEB researchers' activities, our work spans computational biology, computer science, statistical modeling, and comparative genomics, with a strong focus on method and theory. The application of DNA sequencing technologies to characterize the genomes of a wide diversity of microbes has generated vast quantities of genome sequence data. Now the intellectual challenge is to develop from this enormous resource more comprehensive and theoretically robust phylogenetic, genetic, and ecological models to further our understanding of the many roles of microbes in the biological world.

CGEB researchers are united by the common goal of using this vast resource of genomic information to elucidate evolutionary patterns and processes: the pathways by which microbial organisms have diversified over the last 3.5 billion years of Earth's history and through which they continue to shape the global environment. Only through the integration of experimental genomic approaches and sophisticated bioinformatic modeling will we be able to achieve this goal.

CGEB researchers and trainees are supported by grants from the Canadian Institutes for Health Research (CIHR), Natural Sciences and Engineering Research Council (NSERC), and the Nova Scotia Health Research Foundation (NSHRF). The Centre itself is supported by funding from the Tula Foundation (<http://www.tula.ca>), the Faculties of Medicine, Science, and Computer Science, and the Provost and Vice President Academic. CGEB is also supported by a large grant from the Tula Foundation (<http://www.tula.ca>) that provides funds for training top-notch postdoctoral and graduate trainees in the CGEB research specialties. CGEB also has a regular seminar series that brings world renowned scientists to speak at Dalhousie University and interact with faculty members and trainees.

## Centre for Environmental and Marine Geology

Contact: Ann Bannon, Administrator

This Centre was originally founded as the Centre for Marine Geology in 1983 to promote interdisciplinary studies of various types of problems in marine Geology, capitalizing on our unique position in Canada with links to related departments such as Oceanography, Physics, Biology, the Bedford Institute of Oceanography, and our hosting of the Canadian office of the Ocean Drilling Program. Since 1983 the role of the Centre has changed, reflected in the new name, which better describes the work being done now where marine geology is combined with environmental problems. We have three new faculty that expand our expertise into new chronological techniques and permafrost as well as strengthening our capacity in the petroleum-related environmental geology. Some of the objectives of the Centre are to: 1) continue to expand our participation in a revitalized east coast offshore energy related problems; 2) continue our climate-change work with a variety of approaches both offshore and on land; 3) expand into Arctic regions both with major oceanographic and shore-based programs; and 4) expand our capacity to help solve some of the many environmental geology problems associated with urbanization.

## Centre for European Studies

Director: Jerry White (Canada Research Chair in European Studies)

Email: [jerry.white@dal.ca](mailto:jerry.white@dal.ca)

The Centre for European Studies was established in 2007 to promote research on all aspects of European society and its relations with the rest of the world. The Centre facilitates the work of Europeanist scholars at Dalhousie, including the participating Canada Research Chairs in European Studies, enables research collaboration with scholars from Canada and around the world on projects related to Europe and the European Union.

## Centre for the Study of Security and Development

Director: Brian Bow

Established in 1971 the Centre is concerned with teaching, research, publication, policy advice and other professional activities in the various aspects of foreign policy, security studies, development studies, and international politics.

The Centre's work is concentrated in the areas of Canadian and comparative maritime security and oceans policy, Canadian and American foreign and security policies, and global security and international development. Its geographical specializations include Canada, North America, Europe, and the South (especially Africa, Asia, and the Caribbean). The Centre encourages activities in these areas by Faculty, Research, and Doctoral Fellows, and advances communication among local and international communities in these fields through seminars, workshops conferences and colloquia, often in collaboration with local, national, and/or international organizations. It publishes occasional papers and monographs on Maritime Security, Canadian Defence and Security, and Global Security issues.

The Centre is an integral part of the Department of Political Science. Centre faculty offer classes through the Department in foreign and defence policy, international relations and development, and maritime affairs at both undergraduate (majors and honours) and graduate (MA and PhD) levels. They also supervise masters and doctoral theses in these fields.

For further information, consult the Centre's website: [dal.ca/sites/cssd.html](http://dal.ca/sites/cssd.html).

## **Centre for Innovation in Infrastructure**

Director: John Newhook, PhD, PEng

Location: Room B233, Sexton Campus

1360 Barrington Street

PO Box 1000

Halifax, NS B3J 2X4

Phone: (902) 494-2847

Email: [forgeron@dal.ca](mailto:forgeron@dal.ca)

The Centre for Innovation in Infrastructure is an industry-oriented research centre with the Faculty of Engineering and with strong affiliations with the Department of Civil and Resource Engineering. Established in 1983 as the Nova Scotia CAD/CAM Centre, the Centre originally focused on assisting Atlantic Canadian industry with the integration of computer added manufacturing and computer aided design technology in their operations. Since the 1990's the Centre has continued to evolve to meet the needs of industry in other areas and to take a more active role in research and development in civil infrastructure.

Today the Centre act as a focal point for research, innovation, and technology transfer in Civil Infrastructure related areas. The major funding partnerships are with the Atlantic Canadian departments of transportation, industries related to bridge and structural engineering and with companies developing new materials and products for infrastructure.

Our combined areas of expertise and research interests include:

- Structural Analysis and Design
- Structural Health monitoring
- Bridge engineering and innovations
- Soil-steel structures
- Fibre reinforced polymers
- Fibre reinforced concrete
- NDT of bridge decks and pavements
- Sustainable asphalt technology

The Centre has acquired and maintains significant testing equipment related to these research areas and contributes to the maintenance and operation of the research facilities within the Department of Civil and Resource Engineering.

## **Centre for International Trade and Transportation**

## **Centre for Research in Sustainable Supply Chain Analytics (CRSSCA)**

Location: 6100 University Avenue

Room 4065

PO Box 15000

Halifax, NS B3H 4R2

Director: Dr. M. Ali Ülkü  
Phone: (902) 494-3848  
Email: [crssca@dal.ca](mailto:crssca@dal.ca)

Fax: (902) 494-1107  
Website: [www.dal.ca/crssca](http://www.dal.ca/crssca)

The Centre for Research in Sustainable Supply Chain Analytics (CRSSCA), housed in the Rowe School of Business - Faculty of Management, is the supply chain research hub in Eastern Canada. We conduct interdisciplinary research that sheds light on complex issues in supply chain management. Focusing on economic, environmental, and social sustainability, CRSSCA aims to create new knowledge in prescribing solution models for data-driven industrial problems, devise analytical tools for better decision-making, and develop insights into the intricate relationships between supply chain operations, green logistics (global trade, inventory, process and product design, procurement, manufacturing, transportation), and sustainable consumption. CRSSCA supports annual workshops on Supply Chain and Logistics Management (SC&LM), Bachelor of Commerce major in SC&LM, and involvement of students in research activities.

## **Centre for Marine Vessel Development and Research (CMVDR)**

Contact: Josh Leon, Dean of Engineering

The mandate for this Centre is under review.

## **Centre for Transformative Nursing and Health Research**

Director: Dr. Ruth Martin-Misener  
Research Coordinator: Julie Barry  
Location: School of Nursing, 5869 University Avenue, Halifax NS B3H 4R2  
Phone: (902) 494-6125

The Centre for Transformative Nursing and Health Research is a designated Research Centre at Dalhousie University. The vision of the Centre is to undertake collaborative research that develops, enhances, expands, and disseminates evidence and knowledge to inform ways to improve and sustain people's health and wellbeing. The mission of the Centre is to generate nursing research and inspire discovery that is methodologically sound, actionable, and dedicated to improving outcomes for those requiring health care, their providers, and the overall system. Through strong research partnerships and extensive research capacity building initiatives, the Research Centre will be acknowledged as a key resource for health system planning. This collective strength creates a more research-intensive environment, transforming the culture of health research within and beyond the school so that evidence and the quest for new knowledge are well integrated into teaching and clinical practice. The overall improved scholarly environment ensures graduates engage in original research, advance professional knowledge, and are well positioned to be leaders in practice and health system change.

In concert with the School of Nursing's transformation strategy, Academic Plan and Research Strategy and informed by Boyer's Model of Scholarship, the Centre's activities will focus on four research pillars: the health needs of people, health workforce and health systems planning, marginalized populations and health equity, and knowledge translation.

## **Centre for Water Resources Studies**

Director: Graham Gagnon, PhD, PEng  
Location: Office D-514

1360 Barrington Street

Phone: (902) 494-3268

Email: [cwrs@dal.ca](mailto:cwrs@dal.ca)

The Centre for Water Resources Studies was established in December 1981, by a resolution of the Board of Governors (TUNS). The objectives of the Centre are to carry out applied research which contributes to the effective and sustainable protection of water resources in Atlantic Canada, nationally and internationally, and to facilitate the transfer of new knowledge to potential users. Research programs directed by the Centre address the design of cost-effective on-site wastewater systems, soil erosion processes, drinking water treatment, the use of roof water cisterns for domestic water supply, eutrophication, watershed management and the computer modeling of hydrodynamic and hydro chemical processes. The Centre also has a number of research advisory panels, which involve professionals from industry, government and academia in applied research related to water use and water management.

#### **Facilities**

The Centre for Water Resources Studies is located on the fifth floor of “D” Building on Sexton Campus. Laboratory and office space is available for specific graduate research topics, as well as ongoing research carried out by Centre personnel. Analytical equipment includes instrumentation for determining low levels of major ions and nutrients, as well as trace quantities of metal ions in water. The Centre has apparatus for laboratory investigation and pilot scale testing of innovative water treatment methods using Dissolved Air Floatation (DAF) and ozonation and has worked with local consultants and municipalities to develop new applications of the technologies. The Centre is a North American leader in the development of on-site sewage disposal and has had an active research program in this area since 1987. In conjunction with the Faculty of Agriculture, the Centre has a field laboratory investigating sloping sand filters and septic disposal.

#### **Educational Opportunities**

The Centre co-operates with academic units in the training of undergraduate and graduate students who have an interest in water resources. The Centre also participates in the program leading to a dual degree in water resources engineering and planning, in conjunction with the School of Planning into the Faculty of Architecture and Planning.

## **Children and Youth in Challenging Contexts Institute**

Director: Dr. Michael Ungar

The Children and Youth in Challenging Contexts (CYCC) Institute is an interdisciplinary research initiative and a network of Canadian and international researchers committed to making a lasting difference in the lives of vulnerable children and youth. CYCC Institute researchers examine the political, social, psychological, and biological factors that pose serious risks to children and youth exposed to adversity across contexts and cultures. Through interdisciplinary collaboration and innovation, the Institute promotes change at the program and policy level that will improve the protection and well-being of young people around the world. More than 200 policy makers, mental health practitioners, directors of local and international NGOs, law enforcement officers, Aboriginal child welfare advocates, national defence personnel, and researchers are among the community partners who provide leadership to, and benefit from, the work of the Institute.

## **Clean Technologies Research Institute**

Director: Daniel Boyd, PhD

Administrative Offices: 6414 Coburg Road  
PO Box 15000  
Halifax, NS B3H 4R2

Phone: (902) 494-6373

Fax: (902) 494-8016

Website: <http://irm.dal.ca>

Established in 2002, Clean Technologies Research Institute is made up of over 90 faculty members in six faculties (Science, Engineering, Dentistry, Medicine, Architecture and Planning and Health). The goals of the Institute include advancing the collective interdisciplinary research efforts in materials science and engineering at Dalhousie University, facilitating interdisciplinary teaching in materials science within the existing discipline structure, and enhancing interactions between materials researchers at Dalhousie University with relevant government laboratories and industry, especially within the region. The Institute leads collaboration within the university on interdisciplinary applications to funding agencies for major equipment and research infrastructure and collaborates with external organizations to pursue research opportunities.

All Dalhousie University faculty members carrying out research in the area of materials are eligible to be Members of Clean Technologies Research Institute. Postdoctoral fellows and graduate students associated with these research groups are invited to become Associate Members of Clean Technologies Research Institute.

In addition to equipment operated by individual members of the Institute, Clean Technologies Research Institute has established (2003) the Facilities for Materials Characterization, an \$11 million suite of instruments managed by the Institute.

The equipment includes:

- High-field solid-state NMR spectrometer (managed by the Nuclear Magnetic Resonance Research Resource)
- Scanning electron microscope
- Focused ion beam
- X-ray photoelectron spectrometer (XPS)
- Secondary ion mass spectrometer (SIMS)
- Physical property measurement system (PPMS)
- Scanning thermal microscope (SThM)
- Hot press
- Grindo Sonic
- High-speed motion recorder/analyzer
- FT-Raman spectrometer

These facilities are open to external users. Please contact [IRM@dal.ca](mailto:IRM@dal.ca) for details.

## Dalhousie Institute for Society and Culture (DISC)

Director: Associate Dean, Research in the Faculty of Arts and Social Sciences  
Email: [discfasc@dal.ca](mailto:discfasc@dal.ca)  
Website: <http://arts.dal.ca/Research>

Established in 2008, the Dalhousie Institute on Society and Culture serves as the virtual home for the many divergent research activities and initiatives within the Faculty of Arts and Social Sciences. Its primary function is to support research within the faculty through various fellowship programs, publicity and fund-raising initiatives, publishing ventures, conferences and lecture series, and cross-disciplinary exchanges.

The Institute encompasses two broad and overlapping research clusters: *Societies in Local, National, and Global Contexts*, and *Cultural Representations and Presentations*. The former cluster aims to develop new knowledge about political, social, and economic transformations, about national and regional identities, and about global relations, whereas the latter seeks to investigate and preserve cultural traditions, literatures, and languages, to foster studies and theories of cultural identity, to stimulate artistic innovation, to examine the shaping influence of beliefs and religions, and to contribute to the cultural life and profile of the province. These two clusters, with a flexibility and breadth unequalled in Eastern Canada, are uniquely equipped to analyze social and cultural change.

## Global Health Office

Director: Shawna O'Hearn  
Location: C-241, 5849 University Avenue

PO Box 15000  
Halifax, NS B3H 4R2

Phone: (902) 494-1965

Fax: (902) 494-2799

Email: [gho@dal.ca](mailto:gho@dal.ca)

Website: <http://dal.ca/globalhealth>

Working through an interprofessional lens, the Global Health Office is committed to training global health leaders who strengthen health systems for vulnerable populations in Canada and abroad. The office prepares students, residents and faculty doing clinical electives, training or research with our international partners as well as leads local and global electives.

- Events focusing on relevant and timely global health issues are organized through the office including global health rounds, speaker series, conferences.
- Opportunities to become involved in research and mentorship.
- A certificate in “Advocates in Global Health”.
- Annual awards are presented to a student, resident and faculty member who demonstrate leadership in global health
- Partnerships with organizations strengthen the global reach including CSH (Canadian Society for International Health), CCGHR (Canadian Coalition for Global Health Research), National Network on MNCH (Maternal, Newborn and Child Health), ACIC (Atlantic Council for International Cooperation), GHEC (Global Health Education Consortium), and International Centre (Dalhousie)

## Health Law Institute

Director: Constance MacIntosh, BA, MA, LLB

Location: Dalhousie University  
6061 University Avenue  
PO Box 15000  
Halifax, NS B3H 4R2

Phone: 902 494-6881

Email: 902 494-6879

Email: [hli@dal.ca](mailto:hli@dal.ca)

Website: <http://www.dal.ca/hli>

An Interdisciplinary Institute of the Faculties of Law, Medicine, Health, and Dentistry, the Institute is committed to the advancement of health law and policy and the improvement of health care practice and health systems through scholarly analysis, professional education, and public service. Its objectives are:

1. To foster strong and innovative health law and policy scholarship by:
  - cultivating interdisciplinary health law and policy research networks
  - engaging in principled analysis of both recognized and emerging areas of health law and policy
  - enabling knowledge transfer
1. To advance health law and policy education by:
  - designing and implementing education programs for law, medicine, health professions and dentistry students
  - providing continuing education opportunities for health professionals and legal practitioners

1. To serve the public in our areas of expertise by:

- contributing to the societal understanding of health law and policy issues
- providing expertise and consulting to organizations in the public sector
- engaging in and supporting the policy-making process at local, regional, provincial, national, and international levels.

## Healthy Populations Institute

Managing Director: Maureen Summers, MSc  
Scientific Director: Lois Jackson, PhD  
Other: Project Coordinators,  
Research Scholars, Research Assistants, and students  
Phone: (902) 494-2240  
Fax: (902) 494-3594  
Website: [www.dal.ca/hpi](http://www.dal.ca/hpi)

The Healthy Populations Institute or HPI (formerly Atlantic Health Promotion Research Centre, AHPRC) is a leading Canadian health promotion research centre based at Dalhousie University. HPI was established in 1993 to conduct interdisciplinary, collaborative population health and prevention research that informs policies and programs to improve the health and well-being of Canadians.

The centre is conducting research on health services and health systems, healthy eating and physical activity, knowledge translation, prevention of chronic illness and disability, oral health of seniors, youth obesity, aboriginal health, and harm reduction.

The HPI is currently supported by the Faculties of Health, Dentistry, and Medicine, and the Office of the Provost and Vice President Academic at Dalhousie University. Support for specific research projects comes from agencies such as Canadian Institutes for Health Research, Social Sciences and Humanities Research Council of Canada, Nova Scotia Health Research Foundation, and charitable sector research institutes, and private foundations.

Our research associates hold appointments in the Faculties of Health, Architecture, Management, Medicine, Dentistry and Science.

## Institute for Big Data Analytics at Dalhousie University

Director: Dr. Stan Matwin  
Location: Goldberg Computer Science Building  
6500 University Avenue  
PO Box 15000  
Halifax, NS B3H 4R2  
Phone: (902) 494-4320  
Email: [bigdata@cs.dal.ca](mailto:bigdata@cs.dal.ca)  
Website: <https://bigdata.cs.dal.ca>

Big data is not a single breakthrough invention, but rather a coming together and maturing of several technologies: huge, inexpensive data harvesting tools and databases, efficient, fast data analytics and data mining algorithms, the proliferation of user-friendly data visualization methods and the availability of affordable, massive, and non-proprietary computing. Using these technologies in a knowledgeable way allows us to turn the masses of data that are created daily by businesses and government into an important asset that will result in better, more informed decisions. This could lead, for an example, to intelligent, personalized



electric power pricing for consumers, to optimized port traffic management or to the discovery of interesting patterns of migrations in marine life.

The Institute for Big Data Analytics (Big Data @ Dal) acts as a catalyst and a container in which a number of Dalhousie researchers and internationally renowned experts in all of the above areas can work together on Big Data.

The Institute has three main goals. Firstly, we want to become an international hub of excellence in big data research - a place to which scientists will come to work on interesting problems, but also in search of interesting, real-life applications. Our second goal is to make the Institute very relevant to local industries in Nova Scotia, and in Canada. To achieve this goal, we want to focus - for example - on becoming a world leader in the analytics of marine data and all aspects relating to marine biology, fisheries, and shipping. Thirdly, we will develop a focused and advanced training program that covers all aspects of big data, preparing our next generation of researchers and practitioners for this important field of study.

## Law and Technology Institute

Director: Robert J. Currie, BA, MA, LLB, LLM

Associate Director: Steve Coughlan, BA, MA, LLB, PhD

Location: Schulich School of Law  
6061 University Avenue  
PO Box 15000  
Halifax, NS B3H 4R2

Phone: 902 494-1469

Fax: 902 494-1316

Email: [lynda.corkum@dal.ca](mailto:lynda.corkum@dal.ca)

Website: [www.dal.ca/faculty/law/LATI.html](http://www.dal.ca/faculty/law/LATI.html)

The Law and Technology Institute was established at the Schulich School of Dalhousie in 2001 to provide teaching, research, and continuing education on technology law issues to students, faculty members, and the practicing Bar. The Institute participates, with the faculties of Computer Science and Management, in Dalhousie's Master of Electronic Commerce Program, and has been involved in collaborative projects with the private sector and governments on information technology issues. Also, in conjunction with Dalhousie's Industry Liaison and Innovation Office, the Institute sometimes offers a student placement program in intellectual property and commercialization. Its faculty members provide graduate supervision to students interested in the developing field of technology law, and are active in law and technology organizations, such as IT.Can and the International Society for Law and Technology. Faculty members of the institute are writers of the English edition of IT.Can bi-weekly newsletter. The Institute hosts an Eminent Speakers Series, which brings leading IT lawyers and academics to Dalhousie to share their expertise. The Institute is home to the Canadian Journal of Law and Technology, co-edited by Professors Currie and Coughlan. The CJLT is the pre-eminent technology law review in Canada.

### Classes Offered:

- Law and Technology
- Internet and Media Law
- Privacy Law
- Intellectual Property Law
- Information Technology Transactions
- Entertainment Law
- Intellectual Property and Commercialization Placement
- Special Topics on Intellectual Property (IPII)
- Copyright Law
- Patent law

Students also have the opportunity to pursue specialized interests in fields such as criminal law, health law and alternate dispute resolution, as they relate to law and technology.

## MacEachen Institute for Public Policy and Governance

Scholarly Director: Kevin Quigley, PhD

[The MacEachen Institute for Public Policy and Governance](#) at Dalhousie University is a nationally focused, non-partisan, interdisciplinary institute designed to support the development of progressive public policy and encourage greater citizen engagement. The MacEachen Institute is named in honour of [Allan J. MacEachen](#), retired federal cabinet minister and senator and one of Nova Scotia's most accomplished political leaders.

The MacEachen Institute is a collaboration between Dalhousie's Faculties of Arts & Social Sciences, Law, Health and Management, as well as the Office of the Vice-President, Research & Innovation. It stimulates debate, discussion, and research by engaging thought leaders from across Canada and internationally.

The Institute builds on Allan J. MacEachen's legacy and passion by promoting vigorous debate on progressive public policy issues, ranging from community and neighbourhood issues to those of national concern.

## Marine & Environmental Law Institute

Location: Schulich School of Law  
6061 University Avenue  
PO Box 15000  
Halifax, NS B3H 4R2

Phone: 902 494-1988

Fax: 902 494-1316

Email: [MELAW@dal.ca](mailto:MELAW@dal.ca)

Website: <http://www.dal.ca/law/MELAW>

The Institute, which is housed in the Schulich School of Law, carries out teaching, research capacity-building and consultancy activities and also directs the MELP academic specialization. MELAW provides a specialization in marine and/or environmental law to JD students. In addition to their scholarly research and publication activities, MELAW faculty, associates and staff carry out research projects and provide advisory services to agencies of the United Nations, international non-governmental organizations, and regional organizations as well as assisting government departments, private sector institutions and non-governmental organizations in Canada and overseas.

The Marine & Environmental Law Institute is home to the editorial office of the *Ocean Yearbook* and the *Journal of Environmental Law and Practice* (JELP). The *Ocean Yearbook* is a major international interdisciplinary annual, devoted to ocean affairs, published in collaboration with the International Ocean Institute in Malta. Dalhousie law students have the chance to gain experience working as research assistants on the Institute's research projects and workshops and assisting with editing the *Ocean Yearbook*. JELP is the leading environmental law journal for practitioners and academics in Canada.

MELAW supports student collaboration in addressing environmental issues through the Environmental Law Students' Society (ELSS) and the East Coast Environmental Law Association (ECELAW), a non-governmental organization dedicated to environmental law education and law reform. MELAW encourages interdisciplinary collaborations within the Dalhousie University community including the School for Resource and Environmental Studies (SRES), the Marine Affairs Program (MAP), the College of Sustainability, the International Development Studies Program (IDS), the Ocean Frontier Institute (OFI), the Ocean Tracking Network (OTN) led by the Department of Oceanography and the Institute for Ocean Research Enterprise (IORE). MELAW also participates in national collaborations such as, the *Ocean Canada* Partnership. International linkages include: the Global Forum on Oceans, the IUCN Academy of Environmental Law, the Australia Canada Ocean Research Network (ACORN) as well as numerous other partner institutions in Asia, the Caribbean, Europe, South America, and the United States.

# Minerals Engineering Centre

Director: Josh Leon, PhD, PEng

Location: G Building, Sexton Campus

1360 Barrington Street

PO Box 15000

Halifax, NS B3H 4R2

Phone: (902) 494-3955

Fax: (902) 494-3506

Email: [mec@dal.ca](mailto:mec@dal.ca)

Website: <http://minerals.engineering.dal.ca>

The Minerals Engineering Centre was established from the Laboratory for the Investigation of Minerals. The Minerals Engineering Centre provides research, analytical and advisory services to industries, universities, and government bodies in Atlantic Canada, Canada and International. The Centre is located in G Building on Sexton Campus and is affiliated with the Materials Engineering program. The services offered include:

- Sample preparation of ores, soils, silts, rocks, cores, clay fraction and wood pellets
- Size analysis, including screening, sieving, and sub-sieve analysis
- Minerals separation using dense liquids
- Physical and chemical analytical methods using atomic adsorption, XRD, ICP-OES, AA, x-ray fluorescence spectrographic, wet chemical techniques and carboy/sulphur analysis
- Analysis of samples including geological, metalliferous ores, industrial minerals, coals, metals, alloys, and water
- Mineral processing test work covering the whole range of investigative techniques from bench scale to pilot plant, including crushing, grinding, classification, gravity separation, dense medium separation, magnetic separation, electrostatic separation, flotation, flocculation, thickening, filtration, and drying
- Evaluation of biomass fuels calorific value of raw material and wood pellet.

The Minerals Engineering Centre provides opportunities for undergraduate and graduate students to learn various analytical and testing techniques applicable in their course of studies. It also offers services to faculty members to assist in their teaching and research activities.

Further information may be obtained from the Director of the Centre.

## Neuroscience Institute

Contact: [neuroscience.institute@dal.ca](mailto:neuroscience.institute@dal.ca)

Website: <http://www.neuroscience.dal.ca>

The Neuroscience Institute was founded in 1990 to promote and coordinate research in neuroscience, the modern interdisciplinary study of the brain and nervous system.

It serves as an umbrella organization to foster research and training in neuroscience at Dalhousie. A major objective is to increase understanding of the functions of the nervous system in health and disease. To this end, the Institute coordinates the activities of neuroscientists in the Faculty of Medicine, the Faculty of Science, the Faculty of Computer Science, and the School of Biomedical Engineering, facilitating collaboration between clinical and basic scientists in these Faculties. Some foci of current research activity include: development and plasticity of the nervous system; cognitive neuroscience; motor control; autonomic function; synaptic function; and sensory physiology. The Institute also provides a vehicle to seek new sources of funding and encourages new initiatives in all areas of neuroscience research at Dalhousie. In addition, the Institute promotes and coordinates training programs in

neuroscience currently offered through its constituent departments at both the undergraduate and graduate levels. It sponsors seminar series annually and coordinates a variety of community outreach events.

## Norman Newman Centre for Entrepreneurship

Website: <https://dalinnovates.ca/programs/nnce/>

Dalhousie University's flagship entrepreneurship program is the **Norman Newman Centre for Entrepreneurship** in Dalhousie's Faculty of Management. The NNCE fosters an experiential learning environment for students from all faculties interested in entrepreneurship and business creation.

Since 2004, we have been cultivating and promoting entrepreneurship and innovation through curriculum, workshops, seminars, and competitions so that students, faculty and members of the community can develop the skills and creativity needed to bring ideas to market.

All of our programs are designed to enhance students' entrepreneurial knowledge, skills, and networks. The Centre has deep connections to the regional innovation ecosystem that transcend the university, government, and industry boundaries.

### NNCE Programs

**Winter Workshop Series 2021:** Join us for bite-sized sessions designed to give you practical skills to bring you to the next level in your journey in entrepreneurship and innovation. [Learn more here.](#)

**Ready2Launch:** Ready2Launch is a 12-week educational summer accelerator program that helps teams see one, be one for an entrepreneur. Ready2Launch provides participants an involved experience that strengthens founders leadership skills, improves their business acumen, helps them run and grow their business, and helps them figure out how to finance their venture. [Learn more here.](#)

**Path2Innovation:** Path2Innovation is a three-day program taking place April 27-29. It explores the value of entrepreneurial thinking as a means of developing careers and research of leading graduate students, post-docs and faculty and advancing their research, innovations and ideas into impacts, whether that be scientific, economic, social, cultural or environmental. [Learn more here.](#)

**Lab2Market:** Lab2Market (L2M) is the first national-level program in Canada to fund and equip graduate students and their faculty supervisors with the entrepreneurial skills needed to assess the commercial viability of their university-based research innovations. [Learn more here.](#)

## Nuclear Magnetic Resonance Research Resource (NMR3)

Director:	J. K. Rainey, BSc, MSc, PhD
Facility Coordinator:	M. D. Lumsden, BSc, PhD
Solid-state NMR Coordinator:	U. Werner-Zwanziger, BSc, PhD

Established in 1982 with assistance from the Natural Sciences and Engineering Research Council, the Resource is located in the Department of Chemistry and is used by faculty, researchers and graduate students in all Maritime universities, the NRC, local industry, and many Dalhousie Departments. It is concerned with applications of magnetic resonance spectroscopy to problems in chemistry, materials science, biology, biochemistry, and related areas. Its current instrumentation includes Bruker, Avance 300 and Avance 500 NMR spectrometers for liquids and Bruker Avance DSX 400 and Avance 700 NMR spectrometers for solids. NMR<sup>3</sup> users also have direct access to a Bruker Avance III 700 NMR spectrometer with cryoprobe capabilities for liquids experiments. The Avance 500 and Avance 700 NMR spectrometers were installed in 2003 with funding from NSERC, the Canadian Foundation for Innovation and the Atlantic Innovation Fund. The cryoprobes on the Avance III 700 were purchased in 2009 by Dalhousie University through an Atlantic Canada Opportunities Agency Grant. The Resource offers facilities for hands-on use by researchers and also provides NMR spectra and expertise to scientists throughout the Atlantic Region and beyond.

For more information see: <http://nmr3.chemistry.dal.ca>.

# Trace Analysis Research Centre

Director: A. Doucette, BSc, PhD

The Trace Analysis Research Centre (TARC) was established in 1971 with the assistance of a grant from the National Research Council. Its mission is to train analytical chemists and, through research, to contribute to the advancement of analytical chemistry. Members of TARC from Dalhousie and associated institutions comprise a group with expertise in a wide range of chemical analysis techniques in areas such as spectroscopy, chromatography, mass spectrometry, electrochemistry, and nuclear analytical chemistry.

## Resources and Services

### Academic Advising

Academic advisors are available across campus to provide students with academic advising and support. They coach, support and guide students to set and meet educational and career goals.

For students in the Faculty of Arts & Social Sciences, Faculty of Science and Faculty of Agriculture, Student Success Advisors can help you:

- clarify your education and career goals
- monitor your plan of study
- choose courses that relate to your goals and interests
- address concerns about your studies
- apply strategies for academic success
- identify skill-building opportunities such as co-op or study abroad
- develop an action plan if you are struggling in school
- explore academic options (including academic policies) when faced with a personal/family emergency
- determine where to go for additional support

For students in other faculties, there are faculty-specific advisors available to help.

Find out more: [www.dal.ca/advising](http://www.dal.ca/advising) Halifax campuses: [advising@dal.ca](mailto:advising@dal.ca) or (902) 494-3077

Agricultural campus: [ssdalac@dal.ca](mailto:ssdalac@dal.ca) or (902) 893-6672

## Access Services

The [Student Accessibility Centre](#) (Halifax Campus) and the [Student Success Centre](#) (Agricultural Campus) serve as Dalhousie's centres of expertise on student access and accommodation. The work of our access centres is governed by Dalhousie's [Student Accommodation Policy](#), to best support the needs of our students. We advise students who require accommodation to ensure full access to their on-campus living and learning communities.

**Student Accessibility advisors can help you:**

- implement an accommodation plan to reduce or remove barriers to your learning
- provide access to technology supports to enhance your learning
- identify scholarship and bursary options
- connect with on and off-campus resources
- navigate accessibility challenges

If you have had accommodations previously, or have questions about accommodations, early consultation with an advisor is strongly encouraged. An advisor will meet with you to determine how to facilitate your success, and if accommodations are required, we

implement those accommodations by liaising with your instructors. We also consult with faculty, staff, parents, and prospective students, who have questions regarding access and accommodation.

Find out more: [www.dal.ca/access](http://www.dal.ca/access)

Halifax campuses: [access@dal.ca](mailto:access@dal.ca) or (902) 494-2836

Agricultural campus: [ssdalac@dal.ca](mailto:ssdalac@dal.ca) or (902) 893-6672

## Alumni Engagement

As a Dalhousie student, you are part of a diverse global family, including the university's 150,000 alumni. Members of the alumni community provide support and resources to students in a variety of ways. Students are invited to events and initiatives planned by alumni and hosted by the Alumni Engagement team along with Faculties and Schools. You can connect with alumni at social and networking events, educational opportunities, Dal Alumni Days, Open Dialogue events, career support initiatives and more.

If you are curious about what you can do with your Dal degree, our alumni are always willing to provide you with career advice and insight about what where your degree can take you.

Once you become a Dal grad, you will join the growing alumni community and have access to even more benefits, services, discounts, and volunteer opportunities that will serve you at all stages of your life.

Connect with Dal's alumni community today! Visit [alumni.dal.ca](http://alumni.dal.ca) to learn more and follow us on [Twitter](#), [Facebook](#), [LinkedIn](#) and [Instagram](#) to find ways to get involved with the alumni community throughout your time at Dal and beyond.

## Athletics and Recreation

Dalhousie offers a wide array of programs, facilities, and services to suit the diverse sport, recreation and wellness needs of our students. Located on the Studley Campus, [Dalplex](#) is the university's largest fitness centre. Dalplex membership is included in full-time student fees, so students can simply bring their DalCard and swipe it in the turnstile for access to:

- the Cardio Plus Centre
- two climbing facilities
- two weight rooms
- more than 35 weekly fitness classes
- an eight-lane, 50m indoor pool
- a 1/6-mile indoor track
- drop-in times for recreational basketball and volleyball
- racquet courts
- two outdoor tennis courts
- the Fun Zone play area for children.

The [F. H. Sexton Memorial Gymnasium](#) includes a fitness centre, a gym with hardwood courts, group fitness classes, two squash courts, and change rooms with lockers for easy access for students on the Sexton Campus.

Athletics and Recreational Services in Halifax also offers many climbing, fitness, and recreation programs and classes each term, along with a broad range of intramural leagues and tournaments. [Intramural sports](#) are fun, free and an excellent way to meet other students. Sports offered include soccer, flag football and hockey in the fall, to curling, basketball and inner tube water polo in the winter term - and that's just the tip of the iceberg! In Halifax students have the opportunity to take part in more than 20 different [recreational and competitive sports clubs](#), which are organized and run by students. The [Tigers varsity program](#) on the Halifax campuses consists of 14 teams (men's and women's basketball, cross country, hockey, soccer, swimming, track and field, and volleyball) that compete regionally in the Atlantic University Sport (AUS) conference and nationally in U Sports.

The [Langille Athletic Centre](#) is the sport and recreation facility for students on the Agricultural Campus. Intramurals and student activities on the Agricultural Campus include co-ed soccer and softball, basketball, volleyball, badminton, winter ski trips to Wentworth Ski Hill and recreation time dedicated for students and members on Sunday evenings. The DAL AC [Rams varsity](#)

[program](#) includes opportunities for participation on 9 competitive teams in basketball, women's rugby, men's and women's soccer, women's volleyball, badminton, cross country, equestrian and woodsmen. The Rams belong to the Atlantic Collegiate Athletic Association (national association is the Canadian Collegiate Athletic Association), the Atlantic Intercollegiate Equestrian League and the Canadian Intercollegiate Lumberjacking Association for their various sports.

For more information about sport, fitness, and recreation opportunities at Dalhousie visit [www.dal.ca/athletics](http://www.dal.ca/athletics) or [www.dal.ca/rams](http://www.dal.ca/rams).

## Black Student Support

The [Black Student Advising Centre](#) strives to foster a sense of community and inclusion among students who are of black/African descent. Staff provide support to all Dalhousie's students of black/African descent, helping you transition in and through your degree program. We welcome you to make use of our resources to enhance your university experience.

The Black Student Advising Centre offers:

- one-on-one advising and peer support
- tutoring, study skills and writing skill programming
- quiet study spaces and a computer lab
- cultural activities, networking, and orientation events
- information on scholarships and bursaries

For more information, drop by the Centre on the second floor of 1321 Edward Street, contact us at (902) 494-6648 or [bsac@dal.ca](mailto:bsac@dal.ca) or visit us online at [www.dal.ca/bsac](http://www.dal.ca/bsac).

## Career Supports

At Dalhousie there are a number of career supports available to you through the [Bissett Student Success Centre](#) in Halifax and the [Student Success Centre](#) in Truro.

Across all campuses, there is a dedicated team of academic, career and peer advisors here to assist you in exploring your career options, finding jobs, and developing your career. Dalhousie offer a wide range of programs and services to help you find opportunities to get involved, build your skills, and expand your network such as:

- large and small-scale job and career events to connect you to a wide range of prospective employers and job opportunities;
- job search supports including cover letters and resumes reviews, interview preparation and tips on how to present yourself effectively as a candidate for employment;
- on-campus work experience programs designed to help you develop skills, explore your career interest and earn money in a supportive work environment;
- access to year-round workshops, programs and on-line resources to help you with your career questions and future plans.

Find out more information by logging in to myCareer <https://mycareer.dal.ca/home.htm> or visiting the website at [dal.ca/careerservices](http://dal.ca/careerservices).

Halifax Campuses: [careerservices@dal.ca](mailto:careerservices@dal.ca) or (902) 494-3077  
Agricultural Campus: [ssdalac@dal.ca](mailto:ssdalac@dal.ca) or (902) 893-6672

### Career Counselling

Career Counselling is a confidential and collaborative process where you work with a career counsellor who assists you in your educational and career decision-making. Dalhousie's Career Counsellors can be accessed on the Halifax Campuses through the Bissett Student Success Centre, located on the fourth floor of the Student Union Building. Students can make an appointment by calling (902) 494-3077.



# Centre for Learning and Teaching

The Centre for Learning and Teaching (CLT) works in partnership with the provost's office, academic units, faculty members, and graduate students to enhance the practice and scholarship of learning and teaching at Dalhousie University. CLT takes an evidence-based approach to advocating for effective and inclusive learning and teaching practices, curriculum planning, services to support the use of technology in education, and institutional policies and infrastructure to enhance the Dalhousie learning environment. The CLT is dedicated to aligning its activities with the strategic directions of the university, including the Belong report and its recommendations. For further information, teaching resources, or a confidential consultation, you are invited to contact the Centre for Learning and Teaching, located at Suite G90, Killam Library, 6225 University Avenue, (902) 494-1622, [CLT@dal.ca](mailto:CLT@dal.ca), or you can visit the CLT website at: [dal.ca/clt](http://dal.ca/clt)

*Programming:* Workshop series, presentations, discussion groups, and demonstrations are scheduled to address the full spectrum of educational issues, including curriculum design, inclusive practices, classroom design, evaluation of student learning, teaching, and learning strategies, e-learning, and the effective integration of classroom technology.

*Confidential Consultations:* Educational developers at CLT provide confidential consultation services to teaching assistants, faculty, and administrators on a wide range of learning and teaching issues, including cultural competence and other aspects of inclusivity.

*Annual Events:* On an annual basis, CLT coordinates New Academic Staff Orientation, TA Day, Teaching Dossier Workshops, and the Dalhousie Conference on University Teaching and Learning that brings together presenters from across the University and the country to explore issues related to specific themes.

*eLearning:* The eLearning team with CLT offers eLearning advice and support to the Dalhousie community. With two experienced instructional designers, the eLearning team is available to offer guidance with both online and blended/hybrid course initiatives, including ensuring that these course initiatives are accessible.

*Curriculum Renewal:* CLT provides support for curriculum design and renewal at the level of a course, program, department, and faculty. Facilitated department and faculty-specific workshops or retreats assist the formation of cohesive programs by considering how courses and content develop throughout the duration of a program. Departments or programs in the early stages of an MPHEC proposal, internal program review, or accreditation process can take advantage of CLT's resources to design learning outcomes and map the curriculum.

*The Faculty Certificate in Teaching and Learning:* This professional development program offers faculty and staff the opportunity to participate in courses, workshops, and peer exchanges. The Certificate emphasizes evidence-based practices and provides hands-on, practical opportunities to apply these in their own teaching context. The program is offered in partnership with Executive Education in the Faculty of Management.

*Certificate in University Teaching and Learning and the Teaching Assistant Enhancement Program:* These programs are offered to graduate students by the CLT in partnership with the Faculty of Graduate Studies. The purpose of the program is to assist academic departments in preparing students for their teaching responsibilities and to enhance their professional development opportunities for both academic and non-academic careers.

*Classroom Planning:* CLT offers expertise and support to the university in the area of classroom design including support for faculty considering the use of learning spaces in the context of course design and pedagogical approaches.

*Teaching Awards:* CLT administers several university-wide teaching awards, including the Dalhousie Alumni Association Award of Excellence for Teaching, Early Career Faculty Award of Excellence for Teaching, Contract and Limited-term Faculty Award for Excellence in Teaching, Sessional and Part-time Instructor Award of Excellence for Teaching, President's Graduate Student Teaching Award, Educational Leadership Award for Collaborative Teaching, Academic Innovation Award, Award for Excellence in Education for Diversity, and the Award for Excellence in Graduate Supervision.

*Student Ratings of Instruction (SRI):* Higher education institutions in Canada and abroad encourage faculty to use teaching evaluations to rate their teaching for effectiveness. The CLT is responsible for the administration of the university-wide Student Ratings of Instruction. The ratings are administered online towards the end of each term. Quantitative and qualitative data are collected and the opportunity for departments and individual instructors to add questions to the form is available. Students may access the results of the universal questions, Part A of the form, when instructors consent to release the results of their own course(s).



*Grants:* CLT offers a number of Teaching and Learning Grants each year for instructors to develop and evaluate new teaching methods, curriculum innovation, e-learning, and teaching with technology opportunities. The Centre also organizes the Change One Thing Challenge award, inviting instructors to submit their student engagement ideas that they have implemented into their teaching.

*Publications:* The CLT newsletter, *Focus on University Teaching and Learning*, is published three times a year and is available online on the CLT website ([dal.ca/clt](http://dal.ca/clt)). CLT's lending library provides resources on topics related to teaching. CLT's LibGuide of links to electronic sources can be found at: [dal.ca.libguides.com/clt](http://dal.ca.libguides.com/clt).

## Co-Curricular Experiential Learning

Part-time work, volunteering, and leadership programs are great ways to get hands-on experience throughout your degree. You can develop certain skills and maybe discover other career options that interest you. Look for workshops on campus to develop your leadership skills.

### Leadership Programs

With [DALConnects](#) you will do great work for meaningful causes, develop new skills, and build up the experience you will need for your future career. It is a free leadership program that connects you with the off-campus community and develops your leadership potential. By pairing interactive workshops, conferences, and teambuilding retreats with community volunteer opportunities, you develop practical skills that help you become a stronger leader in the classroom, the community, your future career, and in everyday life. In Truro, the [Student Advancement in Leadership program](#) offers the opportunity for students to develop skills in areas such as career exploration, personal growth, communication, and leadership development. Students participate in volunteer activities, attend professional development seminars, participate in international and cultural events, and learn the process of program development.

Halifax Campuses: [connects@dal.ca](mailto:connects@dal.ca)

Agricultural Campus: [sspdalac@dal.ca](mailto:sspdalac@dal.ca)

### Co-Curricular Record

Dalhousie [Co-Curricular Record](#) (CCR) is the university's official way to recognize your experience and involvement outside the classroom. Whether you volunteer, have an on-campus job, play on a varsity team, or are involved in a society/club, you can start building your Co-Curricular Record today!

Bolster your resume and start your record now: [dal.ca/ccr](http://dal.ca/ccr).

Halifax Campuses: [careerservices@dal.ca](mailto:careerservices@dal.ca) or (902) 494-3077

Agricultural Campus: [ssdalac@dal.ca](mailto:ssdalac@dal.ca) or (902) 893-6672

## DalCard

The DalCard is your university identification card that has many uses on and off campus. It must be presented at officially scheduled examinations, to receive bursary or scholarship cheques in person, and to access in-person library services.

It functions as an access pass to Dalhousie athletic facilities including Dalplex, as your dining hall pass with a meal plan, and as a door key to your residence if you live on campus.

Your DalCard can be used as a **debit card** at many locations on campus including the bookstore and select food vendors. It can also be used for printing and photocopying, for laundry in residence (Halifax only), and for food purchases at many off-campus locations in Halifax.

The DalCard Office is located at 6230 Coburg Road. Students on the Sexton campus may obtain their DalCard at the Enrolment Services Centre, B Building, 1360 Barrington Street.

Students on the **Agricultural Campus** may obtain their DalCards from the Enrolment Services Center, Cumming Hall, Room 202, 62 Cumming Dr.

**COVID-19 Advisory:** Our service offerings for 2021/22 will be dependent upon any COVID-19 response and are subject to change. Thank you in advance for your understanding during these uncertain times.

Find out more: [dal.ca/dalcard](http://dal.ca/dalcard) Email: [dalcard@dal.ca](mailto:dalcard@dal.ca) Phone: 902-494-2334

## Dalhousie Arts Centre

For 50 years, the Dalhousie Arts Centre has been integral to the arts community on our campus and our city. It is the only arts complex of its kind in Nova Scotia and includes the Rebecca Cohn Auditorium, the Dalhousie Art Gallery, and the Fountain School of Performing Arts.

Of the numerous performing arts spaces in the Dalhousie Arts Centre, the **Rebecca Cohn Auditorium** is the most familiar and prestigious. The 1,023 seat concert hall is the home of Symphony Nova Scotia, as well as the venue of choice for a wide variety of performers ranging from Ballet Jorgen, Just For Laughs, Billy Connolly, Vance Joy, Bill Burr, Ron Sexsmith, John Prine and Gord Downie, to name a few.

The Arts Centre's **other performing and visual arts spaces** include the Sir James Dunn Theatre (194 seats); the David Mack. Murray Theatre (approx. 80 seats), the MacAloney Room (90 seats), the Sculpture Court and the Dalhousie Art Gallery.

The **Dalhousie Art Gallery** mounts national and international touring exhibitions and initiates many ambitious and exciting programs, making art accessible to our campus community and the broader public. Entrance to the gallery is free of charge.

The **Fountain School of Performing Arts (FSPA)** is the only multi-disciplinary performing arts school in Eastern Canada, offering university degrees in theatre, music, and cinema & media studies. FSPA's full production schedule of plays and concerts, student and faculty recitals, and more can be found at [dal.ca/performingarts](http://dal.ca/performingarts).

**COVID-19 Advisory:** Service offerings for 2021/22 will be dependent upon any COVID-19 response and are subject to change. Thank you in advance for your understanding during these uncertain times.

Find out more at [dal.ca/artscentre](http://dal.ca/artscentre)

Phone: 902-494-3820

## Dalhousie Student Union (DSU)

### Dalhousie Agriculture Students' Association (DASA)

The Dalhousie Agriculture Students' Association (DASA) is the official organization of students on the Agricultural Campus. In addition to representing the students to the administration, DASA spends much of their time organizing events, clubs, groups and committees to improve student life on the Agricultural Campus. They are also responsible for publications such as the Golden Ram (student newspaper), yearbook and student agendas. The Students' Association can be found in Room 32 of the Cox Institute.

All members of the Dalhousie Agriculture Students' Association are automatically also members of the Dalhousie Student Union.

Visit [www.dsu.ca](http://www.dsu.ca) to learn more about the DSU.

## Dalhousie Student Union (DSU)

Every Dalhousie student is automatically a member of the Dalhousie Student Union (DSU). The student union is recognized by an Act of the Nova Scotia legislature as the single voice of Dalhousie students. All student activities on campus are organized through the Dalhousie Student Union, and the DSU is the focus of all student representation. The business of the DSU is conducted by a Council made up of approximately 40 members.

One of the most important resources of the DSU is the Student Union Building (SUB) located at 6136 University Avenue between Seymour and LeMarchant Streets. The SUB was opened in 1968 as a centre for student activity on campus. The Student Union Building provides a wide range of services for students including the Student Advocacy Service, The Grawood, Campus Copy, food services, the Society Hub, and much more.

Every student has the opportunity to take advantage of the Union's financial, physical, and organizational resources whether by coming to events, applying for grants, or getting involved in a committee or campaign. The DSU also oversees almost 400 student societies. All students are invited to satisfy their curiosity by visiting the DSU offices located on the second floor of the SUB and is open from 8:30 am to 4:30 pm Monday through Friday.

Telephone number (902) 494-1106, email [info@dsu.ca](mailto:info@dsu.ca). Check out the website at [www.dsu.ca](http://www.dsu.ca).

## DSU Health and Dental Plan

All full-time students who begin their studies in the fall term are automatically enrolled for coverage under the Dalhousie Student Union (DSU) Health and Dental Plan. The DSU Health and Dental Plan provides coverage for prescription medication, dental, vision, extended health care, accident and travel related expenses.

Please note that part time and distance students as well as students who are on co-op, or exchange in the fall term are not automatically enrolled in this plan and must opt in if they wish to have coverage.

The fee for the DSU Health and Dental Plan is billed to each student's account and is compulsory unless the student has comparable private coverage. If students have comparable coverage, they may be eligible to opt out of (cancel) the DSU Health and Dental Plan during the appropriate opt out period.

Students are also eligible to add immediate family members (spouse and dependent children) to the plan during opt in period in the term in which the student begins their studies only.

Health Plan Information is available online at [www.studentvip.ca/dsu](http://www.studentvip.ca/dsu)

### DSU Health Plan Office Halifax

Student Union Building  
Third floor- Room 344  
[dsuhealth@dal.ca](mailto:dsuhealth@dal.ca) 902-494-2850

### DSU Health Plan Office Truro

MacRae Library- Student Learning Commons  
Room 226  
[dsuhealthtruro@dal.ca](mailto:dsuhealthtruro@dal.ca) 902-893-4904

## DSU International Health Plan

All international students studying in Canada **must have** health insurance coverage ("coverage" refers to all of the things that your health plan includes/covers).

All international students are automatically enrolled for coverage under the Dalhousie Student Union (DSU) International Health Plan. This plan provides emergency medical coverage for services such as visiting the doctor, lab tests, x-rays, etc.

Please note that co-op or exchange students in the fall term are not billed or enrolled for the International Health Plan and must opt in should they wish to have coverage.

The fee for the DSU International Health Plan is billed to each student's account and is compulsory unless the student has comparable private health insurance or MSI. If students have comparable coverage or MSI, they may be eligible to opt out of (cancel) the DSU International Health Plan during the appropriate opt out period. Please contact the DSU Health Plan Office for the opt out period dates.

Students are also eligible to add immediate family members (spouse and dependent children) to the plan when they arrive in Nova Scotia by completing an application and paying an additional fee.

Please note international students may be covered on the DSU Health and Dental Plan as well as the DSU International Health Plan.

*Dual citizens who have applied to Dalhousie as a Canadian are NOT enrolled for coverage under the DSU International Health Plan. If you are a dual citizen, please contact the DSU Health Plan Office as soon as possible to discuss your coverage options.*

Health Plan Information is available online at [www.internationalhealth.ca/dsu](http://www.internationalhealth.ca/dsu).

#### **DSU Health Plan Office Halifax**

Student Union Building  
Third floor- Room 344  
[dsuhealth@dal.ca](mailto:dsuhealth@dal.ca) 902-494-2850

#### **DSU Health Plan Office Truro**

MacRae Library- Student Learning Commons  
Room 226  
[dsuhealthtruro@dal.ca](mailto:dsuhealthtruro@dal.ca) 902-893-4904

## **Email, Computer and Tech Support**

Information Technology Services (ITS) empowers the success of students, faculty, and staff through an overall focus on service, advising and consulting. ITS supports university instructional, research and administrative requirements. The department is responsible for all centrally managed computing, networking and telecommunications facilities including university email, My.Dal, the central information system (Banner), wired and wireless network connections and student computer labs.

Need help with a technical problem? Visit one of three Help Desks located on the Halifax campus, or our Help Desk at the Dalhousie Agricultural Campus in Truro.

With a range of new and emerging technologies, ITS staff will help you explore options to make the most of your experience at Dalhousie. See [dal.ca/its](http://dal.ca/its) for more information.

## **First Year Experience**

There is a lot to know about your first year at university; from choosing the right courses to juggling student life. To help you prepare for your time at Dalhousie, take part in [On Track](#), a suite of programs available to you in your first year, focused on your transition to Dalhousie and discovering your strengths and passions.

If you have questions, the [Bissett Student Success Centre](#) in Halifax and the [Student Success Centre](#) in Truro are a great places to start! Their knowledgeable staff can help you navigate the transition through your first year of university life and answer questions such as:

- What can I expect in university?
- How can I become involved in activities on campus?
- I am feeling overwhelmed with all my work - what should I do?
- How do I get the most out of my university experience?
- How does my degree/program relate to future careers?

In addition to one-on-one advising, the Centres offer peer support, workshops, and programming throughout the year.

Find out more: [www.dal.ca/firstyear](http://www.dal.ca/firstyear) or [www.dal.ca/studentsuccess](http://www.dal.ca/studentsuccess) (Halifax) [www.dal.ca/acstudentsuccess](http://www.dal.ca/acstudentsuccess) (Truro)

Halifax Campuses: [advising@dal.ca](mailto:advising@dal.ca) or (902) 494-3077  
Agricultural Campus: [ssdalac@dal.ca](mailto:ssdalac@dal.ca) or (902) 893-6672

## **Food Services**

Working with our professional food services providers, Dalhousie Food Services operates **three dining halls** on the Studley Campus, one dining hall on the Sexton Campus, and one dining hall on the Agricultural Campus.

A wide selection of **meal plans** are available for students living in residence as well as off-campus students.

Our chefs, with the help of our in-house dietitian, prepare entrées and soups from scratch to promote a healthy lifestyle. With vegan, vegetarian, halal, and no-gluten options available at each meal -- along with an increasing amount of fresh, locally sourced food -- every student will have a variety of tasty and nutritious options available, regardless of their individual dietary needs.

For added variety and convenience, Dal Food Services also operates a number of on-campus **food retail vendors** across campus including Starbucks, Subway, the Second Cup, Tim Hortons and many more.

**COVID-19 Alert:** Our service offerings for 2021/22 will be dependent upon any COVID-19 response and are subject to change. Thank you in advance for your understanding during these uncertain times.

Find out more: [dal.ca/food](https://dal.ca/food) Email: [food@dal.ca](mailto:food@dal.ca) (Halifax Campus) | [julie.fowler@compass-canada.com](mailto:julie.fowler@compass-canada.com) (Agricultural Campus)  
Phone: 902-494-2078 (Halifax Campus) | 902-897-1952 (Agricultural Campus)

## Housing/Residence

### Traditional On-Campus Residence

**COVID-19 Advisory:** Our residence offerings for 2021/22 will be dependent upon any COVID-19 response. Thank you in advance for your understanding during these uncertain times.

## Halifax Campus

Residence	Address	Type of Housing	Approx. # of Spaces	Priority Applicants	Room Type
Gerard Hall	5303 Morris St.	Gender neutral	241	Undergraduate students	Single and double rooms
Howe Hall	6230 Coburg Rd.	Gender neutral	712	Undergraduate students	Single and double rooms
Shirreff Hall	6385 South St.	Gender neutral and female-only	441	Undergraduate students	Single and double rooms
Risley Hall	1233 LeMarchant St.	Gender neutral	490	Undergraduate students	Single rooms
Mini Res	Henry St.	Gender neutral	45	Undergraduate students	Single rooms
LeMarchant Place	1246 LeMarchant St.	Gender neutral	326	Undergraduate students	Single rooms and 2, 3 and 4-bedroom suites

## Agricultural Campus

Residence	Address	Type of Housing	Approx. # of Spaces	Priority Applicants	Room Type
Chapman House	20 Horseshoe Cres.	Gender neutral	123	Undergraduate students	Single, super single and double rooms
Fraser House	10 Horseshoe Cres.	Gender neutral and male only	116	Undergraduate students	Single, super single and double rooms
Trueman House	30 Horseshoe Cres.	Gender neutral	73	Undergraduate and mature/graduate students	Single, super single and double rooms

## Non-Traditional On-Campus Housing

**COVID-19 Advisory:** Our residence offerings for 2021/22 will be dependent upon any COVID-19 response. Thank you in advance for your understanding during these uncertain times.

## Halifax Campus

Residence	Address	Type of Housing	Approx. # of Spaces	Priority Applicants	Room Type
Graduate House	5231 Morris St.	Gender neutral	13	Undergraduate and graduate students	Single rooms
Glengary Apartments	1253 Edward St.	Gender neutral	40	Undergraduate and graduate students	Furnished bachelor and 3-bedroom apartments

## Agricultural Campus

Residence	Address	Type of Housing	Approx. # of Spaces	Priority Applicants	Room Type
Trueman House	30 Horseshoe Cres.	Gender neutral	12	Mature and graduate students	Single rooms

## Living Off-Campus

Dalhousie's Off-Campus Housing [website](#) provides a wide variety of housing resources available for students on both the Halifax and Truro campuses, including a **listing** of apartments, shared accommodations, rooms, condos and houses.

Please note, due to the relatively **low vacancy rate** in Halifax, it is advised that students enrolled in programs on the Halifax campus start looking for off-campus housing well ahead of the academic year. (For the latest vacancy reports, please see the [Canada Mortgage & Housing Corporation website](#).)

Learn more: [dal.ca/och](http://dal.ca/och) Email: [och@dal.ca](mailto:och@dal.ca)  
Phone: 902-494-2429

## Summer Residence

Dalhousie offers space for students to stay in residence over the summer months (May-August) on the Halifax and Agricultural Campuses.

**COVID-19 Advisory:** Our residence offerings for 2021/22 will be dependent upon any COVID-19 response. Thank you in advance for your understanding during these uncertain times.

Find out more: [dal.ca/summerres](http://dal.ca/summerres) Email: [stay@dal.ca](mailto:stay@dal.ca) (Halifax Campus) | [stayintruro@dal.ca](mailto:stayintruro@dal.ca) (Agricultural Campus)  
Phone: 902-494-8840 (Halifax Campus) | 902-893-3103 (Agricultural Campus)

## Housing/Residence

The university is pleased to **guarantee residence** in university-owned properties for all **new, direct-from-high-school** undergraduate students who complete the residence application process by **June 15**. It is important that students planning to attend Dalhousie think well in advance about their accommodation needs.

If you would like to apply for residence, please be aware of these **important points**:

- Upon admission to a program of study, you will be asked to pay an admission deposit.
- Once you have paid your admission deposit, you can proceed to complete the online residence application.
- Please pay your admission deposit promptly as the dates these are completed will determine when your Residence Application is considered.

**It's important to pay your university admissions deposit BEFORE applying to residence.** (Please allow 2-3 business days before your admissions deposit is processed.) Your residence application is not considered to be complete until:

1. you pay the residence application fee, and
2. you have been sent an email confirming that your residence application has been received.

**Students with disabilities** or requiring **special accommodations** are encouraged to contact the Residence Office at 902-494-1054, or email [residence@dal.ca](mailto:residence@dal.ca) for information and assistance. Students requiring additional supports are also encouraged to contact the [Student Accessibility Centre](#) prior to moving into residence.

The **traditional-style residences** at Dalhousie are mainly for undergraduate students. All students living in traditional-style residences are required to purchase one of the meal plan options available.

The information below gives a description of 1. traditional on-campus residences, 2. non-traditional on-campus residences, which includes apartment style housing owned by the university, 3. the services offered by the Off-Campus Housing office, and 4. summer residence. For information on residence fees, see the Fees Section of the Calendar.

It is the responsibility of the individual student in all cases to make a separate online application to the university housing of their choice.

A **non-refundable \$50 fee** is payable when applying for residence. Please note that you will not be able to submit an application without paying the \$50 non-refundable deposit.

**COVID-19 Advisory:** *Our residence offerings for 2021/22 will be dependent upon any COVID-19 response. Thank you in advance for your understanding during these uncertain times.*

## Human Rights & Equity Services

Human Rights & Equity Services' (HRES) mission is to be a focal point, a resource, and a leader in the development of a respectful, equitable, diverse, and inclusive campus community. Our strategic framework outlines areas of focus along with guiding principles, strategic goals, and priority initiatives, with four areas of focus: leading institutional change, building connections and capacity, managing cases, and ensuring operational effectiveness.

HRES is responsible for administering the following University policies: The Employment Equity Policy; the Statement on Prohibited Discrimination; the Personal Harassment Policy; and the Sexualized Violence Policy. We liaise with the Office of the Vice-Provost, Student Affairs, regarding the Code of Student Conduct, and the Residence Code of Conduct; and with the Student Accessibility Centre, as needed, in relation to the Student Accommodation Policy; and Human Resources regarding the Accommodation Policy for Employees. Security Services is a key partner in supporting campus safety.

Other initiatives in Human Rights & Equity Services include education and training on topics such as anti-black racism, micro-aggressions, human rights, bystander intervention strategy, harassment awareness and prevention, prevention of sexualized violence, conflict resolution, and more. Workshops can be request online via our website. HRES's education team also coordinates a multitude of campus events and campaigns, including but not limited to, Mi'kmaq History Month, Pride Week, 16 Days of Activism Against Gender Based Violence, Speak Truth to Power, etc.

**Main office:** (902) 494-6672  
**Fax:** (902) 425-1207  
**Email:** [hres@dal.ca](mailto:hres@dal.ca)  
**Website:** [www.dal.ca/hres](http://www.dal.ca/hres)

To connect with the Vice Provost, Equity & Inclusion and/or Directors of Community Engagement, please email [vpei@dal.ca](mailto:vpei@dal.ca)

## Indigenous Student Support

Dalhousie's Indigenous Student Centres help create a sense of cultural belonging to support your success while at Dalhousie. Our Indigenous Student Advisors provide support and advocacy for all of Dalhousie's Indigenous students. We welcome you to make use of our cultural, educational and career resources to enhance your university experience.

The Indigenous Student Centre provides:

- one-on-one advising and advocacy
- academic support through tutoring, study skills and writing skill development
- quiet study space and a computer lab
- access to cultural activities
- information on scholarships and bursaries
- a space to smudge

On the Halifax campus, visit our Centre (1321 Edward Street) to connect with your peers, or speak with your advisor. You can also contact us by phone at (902) 494-8863. Visit [dal.ca/indigenous](http://dal.ca/indigenous) for more information.

On the Truro Campus, visit the Manager, Indigenous Students in the Dairy Building to take advantage of academic advising, learn about services on campus and find out how to connect with your peers. For more information, contact the Manager, Indigenous Students, at (902) 956-9270.

## International Exchange and Study Support

Dalhousie University is committed to providing international mobility opportunities for all students. International exchange, study abroad programs, field courses and other international learning experiences are offered and supported through providing access to several funding programs, offering pre-departure information, and providing ongoing student and staff support. An advisor and peer supporters are available to meet on topics related to international learning.

Find out more: [www.dal.ca/studyabroad](http://www.dal.ca/studyabroad)

Drop by or contact us:

Halifax Campuses - International Centre  
1246 LeMarchant Street  
[international.centre@dal.ca](mailto:international.centre@dal.ca)  
+1 (902) 494-1566

Agricultural Campus - International Office  
157 College Road  
[intdalac@dal.ca](mailto:intdalac@dal.ca)  
+1 (902) 893-6514

## International Student Support

Dalhousie University is committed to welcoming, supporting and serving the needs of new and continuing international and exchange students. Advisors are available to meet with you on a variety of topics including immigration, finances, exchange opportunities and personal issues. Referrals are made to other resources and services on campus when necessary.

Orientation activities are organized to assist international and exchange students in adjusting to their new culture and in achieving their educational and personal goals. A variety of social, cultural and information programs are held throughout the year. During the fall, winter and spring/summer terms, student peer supporters are available to meet with international and exchange students.

Find out more: [www.dal.ca/international](http://www.dal.ca/international) (Halifax) or [www.dal.ca/acstudentsuccess](http://www.dal.ca/acstudentsuccess) (Truro) or drop by a Centre!

Halifax Campuses - International Centre  
1246 LeMarchant Street  
[international.centre@dal.ca](mailto:international.centre@dal.ca) or (902) 494-1566



## LGBTQ2SIA+ Collaborative

The education advisor in Human Rights and Equity Services works with a number of campus groups who offer LGBTQ2SIA+ support, resources, and training, including: Dal Allies, Dalhousie Student Union, DalOUT, OUTLaw, South House Sexual and Gender Resource Centre, and more.

Contact these groups directly, visit the website at [dal.ca/hres](http://dal.ca/hres) or make an appointment with the education advisor by emailing [hres@dal.ca](mailto:hres@dal.ca).

## Libraries

## Multifaith

Dalhousie Multifaith Services is a non-threatening space where Dalhousie and King's students, staff and faculty can address the basic questions of meaning and purpose in their lives — no matter what their faith, philosophy or doubt may be.

What we do:

- offer confidential guidance on personal and spiritual issues
- lead groups in discussion and prayer
- facilitate interfaith, ecumenical, and multifaith dialogue on the campus
- conduct services of worship and memorial services
- offer prayers at public services
- provide religious rites, marriage preparation, and perform marriages
- participate in Orientation and other events at the University
- plan workshops, lectures and social activities
- help locate worship communities for different faith traditions

For more information about the services and supports we offer, or to speak with a chaplain, drop by Multifaith Services on the fourth floor of the Student Union Building at 6136 University Avenue.

Website: [www.dal.ca/multifaith](http://www.dal.ca/multifaith)

Halifax Campuses: [multifaith@dal.ca](mailto:multifaith@dal.ca) or (902) 494-2287

## Personal Counselling

As a student you will find that most of the time you can deal with the everyday issues that pop up while attending university. But life can sometimes challenge you in unexpected ways.

On the Halifax Campuses, supports and services offered through the [Student Health & Wellness Centre](#) help students address problems and learn new skills in a confidential, supportive environment. Counselling is provided by professionally trained counsellors and psychologists and is available for individuals and on a group basis. Students can access counselling services through a same-day counselling appointment available on a first come, first-served basis every hour the Student Health & Wellness Centre is open.

The Dalhousie Student Health & Wellness Centre team includes psychologists who may provide screening assessments, learning strategies, and advocacy services to students with learning disabilities (LD), attention-deficit hyperactivity disorder (ADHD), and/or Autism Spectrum Disorder (ASD) depending on information obtained from an initial intake interview (with a psychologist).

[Career Counselling](#) is a confidential and collaborative process where you work with a career counsellor who assists you in your educational and career decision-making. Dalhousie's Career Counsellors can be accessed on the Halifax Campuses through the Bissett Student Success Centre, located on the fourth floor of the Student Union Building. Students can make an appointment by calling (902) 494-3077.

On the Agricultural Campus, students can meet with nurses at [Health Services](#) in the Dairy Building who work with students to take care of their physical and mental health and can also refer students to community psychologists. Through the campus physician, students may also receive a referral to a psychiatrist.

Students can also receive online support for feelings of depression, anxiety or stress through the use of the [TAO](#) (Therapy Assistance Online) app, an online self-help program. It includes modules that you work through at your own pace, either independently or with a TAO coach. Students can also access telephone counselling 24/7/365 with the Good2Talk program (1-833-292-3698).

Find out more: [www.dal.ca/studenthealth](http://www.dal.ca/studenthealth).

Make an appointment:

Halifax Campuses: (902) 494-2171

Agricultural Campus: (902) 893-6300

## Registrar's Office

The Registrar's Office is responsible for high school liaison, admissions, awards and financial aid, registration, maintenance of student records, scheduling and coordinating formal examinations, and convocation. Of greater significance to students, however, is the role played by members of the staff who provide information, advice, and assistance. They offer advice on admissions, academic regulations and appeals, financial aid and budgeting and the selection of programs. In addition, they are prepared to help students who are not quite sure what sort of assistance they are looking for, referring them as appropriate to departments for advice about specific major and honours programs or to Student Affairs or to specific service areas such as Counselling Services.

Students can access the services of the Registrar's Office at three locations.

### **Main office (Studley Campus):**

Room 130, Henry Hicks Academic Administration Building  
6299 South Street  
Halifax, NS

### **Enrolment Services Centre (Sexton Campus):**

Building B, 1360 Barrington Street  
Halifax, NS

### **Enrolment Services Centre (Agricultural Campus):**

Room 100, Cox Institute, 21 Cox Road  
Truro, NS

### **Enquiries may be directed to:**

The Registrar  
Dalhousie University  
PO Box 15000  
Halifax, NS Canada B3H 4R2  
Telephone: (902) 494-2450  
Fax: (902) 494-1630  
Email: [registrar@dal.ca](mailto:registrar@dal.ca)

## Safety

Dal Security operates in a uniform capacity 24/7, 365 days of the year as the on-campus emergency first responders across all four Dal campuses (including three in Halifax and one in Truro). We pride ourselves in offering approachable and accessible services to all

members of the Dal community. We have a robust social media presence where you can find updates on events, safety tips, and information on campus closures.

Follow us at @DalSecurity on Twitter and Dal security on Instagram. Through collaboration with our on-campus partners, services are quickly and conveniently accessible by downloading our free DalSAFE app. Come visit us in person at one of our three offices; our main office is located in the parkade of the Marion McCain Arts and Social Sciences building on the Studley campus in Halifax, a secondary office is located in the Dairy building on the Truro campus, and a third satellite office is located at the Sexton campus in Halifax.

Dalhousie Security can also be reached at (902) 494-6400 (Halifax Campuses) and (902) 893-4190 (Truro Campus) in any emergency.

## South House

A DSU service and Halifax's only full-time gender justice centre. A volunteer-driven, student-funded, gender-inclusive safe space for all members of the Dalhousie community. South House is a trans- and queer-positive, wheelchair-accessible space that offers a resource centre, library, and free meeting space for woman-positive and anti-oppression organizing and gathering. Visit us online at [www.southhousehalifax.ca](http://www.southhousehalifax.ca) or drop by the Centre on the basement floor of 1443 Seymour Street.

## Student Advocacy

The Dalhousie Student Advocacy Service helps ensure that students receive fair and reasonable decisions on issues dealing with academic appeal and discipline matters. Our volunteer advocates advise students about their case, help them draft and edit any written submissions, prepare them for hearings and formal appeals, and provide support through the process and articulates matters of importance during the oral hearing. This year-round service is confidential and operated entirely by students. Contact us at the Student Union Building (Room 310), by phone at (902) 494-2205 or visit us online at [www.dsu.ca](http://www.dsu.ca).

## Student Affairs

The Vice-Provost, Student Affairs (VPSA) is Dalhousie University's chief officer of student affairs. The Division of Student Affairs is responsible for strategy, policy development, program development and implementation, and management of all matters relating to the provision of a transformative student experience.

The Division includes an integrated team of specialists who works collaboratively to support the institution's academic mission and the holistic success of a diversity of students, through their journey from prospective student, through applicant and enrolled students, to learner and scholar, and, ultimately, graduate and engaged citizen.

The units within the Division support four pillars: Student Registrarial and Enrolment Support; Student Health & Wellness; Student Learning and Academic Support; and Student Life and Leadership Development.

Our units include:

- Agricultural Campus Student Success Centre;
- Bissett Student Success Centre: Academic Advising and Career Services;
- Black Student Advising Centre;
- Co-Curricular Experiential Learning;
- Indigenous Student Centre;
- International Centre;
- Multifaith Services;
- Registrar's Office;
- Residence and Student Life;
- Student Accessibility Centre;
- Student Affairs Communications and Marketing;
- Student Conduct Office;
- Student Health and Wellness;

- Studying for Success; and
- Writing Centre

## Student Clubs and Organizations

With so many clubs and organizations on campus, not only will you find plenty of people who share **common interests**, but you will have an opportunity to **try something completely new**. The mobile app offered through the [Dalhousie Student Union](#) offers a searchable listing of hundreds of student clubs and societies. Browse the listings and find societies that suit your interests.

Also, be sure to watch for the **Society Fair in September**. The fair is a chance for all societies to showcase their activities and objectives to other Dal students. Drop in, visit society booths, and discover clubs, societies and organizations that may be of interest to you. Watch for details on the DSU website. And, if you do not find a society of interest, **start your own!**

Find out more: [www.dal.ca/studentlife](http://www.dal.ca/studentlife)

Email: [dsumemberservices@dal.ca](mailto:dsumemberservices@dal.ca) or [studentlife@dal.ca](mailto:studentlife@dal.ca)

Phone: (902) 494-1106 (Halifax Campuses) or drop by Room 32 of the Cox Institute (Agricultural Campus)

## Student Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students do not follow this community expectation. Dalhousie recognizes its students as independent adults, and the Code exists to maintain a minimum standard of behaviour that is deemed acceptable by our community. The Code is very broad and encompasses many types of behaviour.

When appropriate, violations of the code can be resolved in a reasonable and informal manner. If an informal resolution cannot be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Visit [Student Conduct](#) online for more information.

## Student Health & Wellness

Dalhousie Student Health & Wellness is committed to providing quality **healthcare** and services to promote and enhance students' good **health and well-being**. Student Health and Wellness services are easily accessible and geared toward the unique health needs and concerns of students.

The Halifax campuses' [Student Health & Wellness Centre](#) is located on the second floor of 1246 LeMarchant Street. The Centre's interprofessional team includes:

- counsellors
- doctors
- health promotion experts
- nurses
- psychiatrists
- psychologists
- social worker

Students can [book online](#), call or stop by the Student Health & Wellness Centre for a same day medical or counselling appointment.

The [Agricultural Campus' Health Services](#) clinic is located in the Dairy Building, next to Cumming Hall. Registered nurses at the clinic provide confidential assessments, health education, on-the-spot testing and treatment for conditions such as urinary tract infections, strep throat, sexually transmitted infections, as well as cold and flu assessments, first aid, stress management guidance, and select immunizations and immunization updates. Nurses also provide referrals to appropriate community resources.

A campus physician is also available by appointment. Physician appointments can be booked by contacting Health Services.

All students must have [medical and hospital coverage](#). All Nova Scotia students are covered by the Nova Scotia Medical Services Insurance. All other Canadian students must [maintain coverage](#) from their home provinces.

International students have the same access to services, supports, workshops, events and online health and wellness resources as Canadian students, as well as additional services available to you, detailed [here](#). All non-Canadian students must be covered by medical and hospital insurance. Details of the Dalhousie Student Union International Health Plan can be found [here](#).

Find out more: [www.dal.ca/studenthealth](http://www.dal.ca/studenthealth)

Phone: (902) 494-2171 (Halifax Campuses) (902) 893-6300 (Agricultural Campus) specialist health care providers.

## Studying for Success

At Dalhousie, we have dedicated staff available to assist students in becoming more efficient and effective learners.

On the Halifax campuses, the [Studying for Success program](#) offers workshops to small groups of students to develop or enhance personal learning strategies and, when applicable, workshops are customized to focus on particular disciplines or fields of study ensuring that the workshop content is relevant to the needs of participating students.

On the Agricultural Campus, the [Student Success](#) Coordinator helps students reach their potential through a variety of programs and events. Students benefit from attending formal training in study skills and can make an appointment to meet with the coordinator for one-on-one coaching or attend Study Skills sessions offered regularly throughout the year.

Topics regularly covered include time management, getting the most from lectures, critical reading, goal setting, note-taking, studying effectively, memorization and concentration, and preparing for and writing exams. Study Skills coaches provide one-on-one support either by appointment or on a drop-in basis and will refer students to other academic resources when appropriate.

If you are looking for assistance in understanding specific course content and assignments, or preparing for tests and exams, our tutors are able to help. We can match you to an appropriate tutor in your field of study.

Find out more: [www.dal.ca/advising](http://www.dal.ca/advising)

Halifax Campuses: [sfs@dal.ca](mailto:sfs@dal.ca) or (902) 494-3077

Agricultural Campus: [ssdalac@dal.ca](mailto:ssdalac@dal.ca) or (902) 893-6672

## University Bookstore

The Dal Bookstore is owned and operated by Dalhousie University. With three physical locations on campus -- the main store in the Student Union Building on the Studley Campus; the Administration Building on the Sexton Campus, and Jenkins Hall\* on the Agricultural Campus -- and a convenient online store, the Dal Bookstore proudly serves the academic and school-spirit needs of students, staff, faculty, and alumni.

The Dal Bookstore offers course materials in **several formats** including new, used, binder-ready and digital. Used book buybacks are held at the bookstore. You can learn more about the Book Buyback program [on our website](#).

In addition to course materials, the Dal Bookstore also carries a wide selection of **stationery, clothing, gift ware, graduation rings and frames and other items**. Our clothing can be customized for societies, sports teams, and any other groups for a uniquely Dalhousie look. Consider the Dal Bookstore as your go-to hub for all your Tiger and Ram-inspired gear!

In addition to textbooks and course supplies, the Dal Bookstore carries a large and convenient collection of **items for apartments and residence dorm rooms**, including bedding, towels, décor items, and even a selection of appliances. Anything you purchase online can be delivered or picked up in store. And if you live in residence, most anything you order online over the summer as part of our popular [Books in Res program](#) can be packaged and delivered to your residence for when you move in.

When you pay for items at the Bookstore with your DalCard, **5% of the purchase price** is put back on your account and applied toward future purchases.

**COVID-19 Advisory:** Our service offerings for 2021/22 will be dependent upon any COVID-19 response and are subject to change. Thank you in advance for your understanding during these uncertain times.

Find out more at [bookstore.dal.ca](http://bookstore.dal.ca)

Email: [bookstore@dal.ca](mailto:bookstore@dal.ca)

Phone: 902-494-2460 (Studley Campus) | 902-494-3166 (Sexton Campus) | 902-893-6728 (Agricultural Campus)

\* Note: The Jenkins Hall location is temporary and subject to change.

## University Secretariat

The University Secretariat provides professional and administrative support and advice to the Board of Governors and University Senate so as to facilitate their effective governance of the University.

The Secretariat manages, coordinates, and informs the effective operation of the Board and Senate by:

- Supporting the operations of the University's governance bodies and their respective standing and ad hoc committees;
- Proposing and developing objectives and plans to establish and achieve priorities;
- Advising on governance issues and developing and implementing policies, procedures and processes that reflect governance best practices;
- Developing, implementing, managing and coordinating the University academic integrity, student discipline and academic appeals policies and processes, and maintaining official records relative to these processes;
- Serving as a repository for university policies and information and data on matters relating to University governance; and
- Facilitating communication and collaboration with key stakeholders.

Visit the website at [dal.ca/secretariat](http://dal.ca/secretariat)

## Writing Skills

Students in all disciplines at Dalhousie are required to write clearly to inform, persuade, or instruct an audience in term papers, lab reports, essay exams, critical reviews, and other academic assignments. Students can benefit from a one-on-one discussion of their work with supportive instructors and peer tutors at the Writing Centre. In addition to the one-on-one tutoring, the Writing Centre hosts seminars held throughout the year on topics such as essay writing, science writing, mechanics of writing, English as another language, and admission applications as some examples.

In Halifax, you will find the [Writing Centre](#) in the Killam Library's Learning Commons. Writing tutors are also available in satellite locations: Sexton Campus, Wallace McCain Learning Commons, Black Student Advising Centre, and the Indigenous Student Centre.

Students on the Agricultural Campus can visit the [Writing Centre](#) on the main floor of the MacRae Library.

Find out more: [www.dal.ca/writingcentre](http://www.dal.ca/writingcentre)

Halifax Campuses: [writingcentre@dal.ca](mailto:writingcentre@dal.ca) or (902) 494-1963

Agricultural Campus: [ssdalac@dal.ca](mailto:ssdalac@dal.ca) or (902) 893-6672

## Financial Aid

### Government Student Loans

**IMPORTANT:** Please note that federal and provincial student loan regulations include stipulations for the Borrower in terms of the minimum course load, expressed as a percentage of the normal course load at the University, which the Borrower must carry in order to benefit from the program. This minimum must be maintained throughout the academic year, e.g. a student who wishes to receive either money or interest-free status under the Canada Student Loan Plan for the entire academic year must carry not fewer than 60 per cent of the normal course load (expressed in credit hours) for each term. Please note, to be eligible for provincial loan funding from Newfoundland, you must be registered in 80% of the normal class load. At Dalhousie, the normal credit hour load for student loan purposes is 30. The Borrower must carry not fewer than 18 credit hours, distributed equally between the terms, e.g.

nine. If your particular program does not conform to this scheme, you should apply to Student Aid for funding for only that term in which your course load would fulfill this regulation. Federal and provincial rules can differ on this matter.

If you must drop or add courses, exercise care so as not to jeopardize your governmental student loan(s).

### **Addresses of Provincial Student Aid Authorities**

Canadian students are to apply for government assistance to the appropriate agency in that province or territory in which the applicant is a bona fide resident.

#### ***Alberta***

Alberta Students Finance  
PO Box 28000  
Station Main  
Edmonton, AB T5J 4R4  
Fax: (780) 422-4516  
Tel: (780) 427-3722  
1-800-222 6485 (toll free in Canada)  
<http://studentaid.alberta.ca>

#### ***British Columbia***

Student Services Branch  
Ministry of Advanced Education  
PO Box 9173  
Stn Provincial Government  
Victoria, BC V8W 9H7  
Fax: 1-800-262-2112  
1-800-561-1818 (toll free in Canada/US)  
<http://studentaidbc.ca>

#### ***Manitoba***

Manitoba Student Aid Advanced Education  
409 - 1181 Portage Avenue  
Winnipeg, MB R3G 0T3  
Fax: (204) 948-3421  
Tel: (204) 945-2313 (outside Manitoba)  
1-800-204-1686 (toll free in Manitoba)  
[www.manitobastudentaid.ca](http://www.manitobastudentaid.ca)

#### ***New Brunswick***

Student Financial Services  
Department of Education  
PO Box 6000  
440 King Street, Suite 420  
Fredericton, NB E3B 5H1  
Fax: (506) 444-4333  
Tel: (506) 453-2577 or  
1-800-667-5626 (Atlantic Provinces, Ontario, and Quebec only)  
[www.studentaid.gnb.ca](http://www.studentaid.gnb.ca)

#### ***Newfoundland & Labrador***

Newfoundland and Labrador  
Student Financial Assistance  
PO Box 8700  
St. John's, NL A1C 4J6  
Fax: (709) 729-2298  
1-888-657-0800  
[www.aes.gov.nl.ca/studentaid](http://www.aes.gov.nl.ca/studentaid)

#### ***Northwest Territories***

Student Financial Assistance  
Department of Education  
Cultural and Employment  
Government of NWT  
PO Box 1320  
Yellowknife, NT X1A 2L9  
Fax: 1-800-661-0893  
Tel: (867) 873-7190  
1-800-661-0793  
[www.nwtsfa.gov.nt.ca](http://www.nwtsfa.gov.nt.ca)

### ***Nova Scotia***

Labour and Advanced Education Student Assistance  
PO Box 2290, Halifax Central  
Halifax, NS B3J 3C8  
Fax: (902) 424-0540  
Tel: (902) 424-8420 (metro)  
1-800-565-8420 (within province)  
(Street location: 1256 Barrington Street, Halifax, NS)  
<http://novascotia.ca/studentassistance>

### ***Nunavut***

Adult Learning & Post-Secondary Services  
Nunavut Department of Education  
Box 390  
Arviat, NU X0C 0E0  
Fax: 1-877-860-0167  
1-877-860-0680  
[www.gov.nu.ca/education](http://www.gov.nu.ca/education)

### ***Ontario***

Ontario Student Assistance Program  
Student Support Branch  
Ministry of Training,  
Colleges and Universities  
PO Box 4500  
Thunder Bay, ON P7B 6G9  
Fax: (807) 343-7278  
Tel: (807) 343-7260  
<http://osap.gov.on.ca>

### ***Prince Edward Island***

Student Financial Services  
Department of Education  
PO Box 2000  
16 Fitzroy St  
Charlottetown, PE C1A 7N8  
Fax: (902) 368-6144  
Tel: (902) 368-4640  
[www.studentloan.pe.ca](http://www.studentloan.pe.ca)

### ***Québec***

Residents of Québec apply to:  
Ministère de l'Éducation  
Aide financière aux études  
1035, rue De La Chevrotière  
Québec, QC G1R 5A5  
Tel: (418) 646-4505



1-888-345-4505  
[www.afe.gouv.qc.ca](http://www.afe.gouv.qc.ca)

### ***Saskatchewan***

Student Financial Assistance Branch Saskatchewan Learning  
3085 Albert Street, Walter Scott Building  
Regina, SK S4P 3V7  
Tel: (306) 787-5620  
1-800-597-8278  
[www.saskatchewan.ca/studentloans](http://www.saskatchewan.ca/studentloans)

### ***Yukon Territory***

Students Financial Assistance  
Advanced Education Branch  
Department of Education  
Government of Yukon  
PO Box 2703  
Whitehorse, YT Y1A 2C6  
Fax: (867) 667-8555  
Tel: (867) 667-5929  
1-800-661-6408 Local 5929 (within Yukon)  
[www.education.gov.yk.ca](http://www.education.gov.yk.ca)

## **Temporary Loans**

The University has established a temporary loan program to assist all registered Dalhousie students with certain types of short-term financial difficulty when no other resource is available. Students must provide proof of their ability to repay the loan within the time period. (Loans are not meant for tuition fee payment.) These loans have a short interest-free period, after which interest will be charged. Refer to the Temporary Loan Application for further details. Applications may be picked up in the Registrar's Office, Room 130, Henry Hicks Academic Administration Building, the Sexton Campus Student Service Centre, the Enrolment Services Centre (Agricultural Campus), or online at [www.dal.ca/moneymatters](http://www.dal.ca/moneymatters)

# **Fees**

## **Service Locations**

### **Studley Campus**

Henry Hicks Academic Administration Building, Rm 29  
Monday to Friday, 9am - 4pm  
tel: (902) 494-3998  
fax: (902) 494-2839  
email: [student.accounts@dal.ca](mailto:student.accounts@dal.ca)

### **Sexton Campus**

Enrolment Services Centre  
Monday to Friday, 9am - 4pm  
tel: (902) 494-3998  
fax: (902) 494-2839  
email: [student.accounts@dal.ca](mailto:student.accounts@dal.ca)

### **Agricultural Campus**

Enrolment Services Centre  
Monday to Friday, 9am - 4pm  
tel: (902) 893-6361  
fax: (902) 895-5529  
email: [enrolment.services@dal.ca](mailto:enrolment.services@dal.ca)

## **Important Dates**

## September

- 17 Fees due for fall term
- Last day to pay without late registration fee of \$50
- Last day for complete refund

## October

- 18 \$50 reinstatement fees assessed to accounts with balances of \$100 or more

## November

- 1 Last day for partial refund fall term

## January

- 14 Fees due for winter term and second instalment of regular session
- Last day to pay without late registration fee of \$50
- Last day for complete refund

## February

- 14 \$50 reinstatement fee assessed to accounts with balances of \$100 or more

## March

- 7 Last day for partial refund for winter term

NOTE: Please consult the online summer school timetable for the summer school registration schedule.

Website [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca)

## Introduction

The following section of the calendar outlines the University Regulations on academic fees for both full-time and part-time students enrolled in programs of study during the Fall, Winter and Summer terms. A section on university residence and housing fees is also included. Students wishing to register for the Summer Term should consult the summer school timetable online at [www.dal.ca](http://www.dal.ca) for information on registration dates and fees.

All fees are subject to change with approval of the Board of Governors of Dalhousie University. The 2021/2022 Academic Fee Schedule will be available in June 2021 at [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca).

NOTE: Student tuition fees and other fees published herein are applicable only to regular students admitted to a program through the normal application process. Other students who are admitted to Dalhousie under a special program or policy will be charged student tuition and other fees in accordance with such special program or policy. For further information regarding these fees, please contact Student Accounts or the Dean's office of the applicable faculty.

Students should make special note of the academic dates contained in the front section of the calendar as well as fee dates. Students should also be aware that additional fees and/or interest will be charged when deadlines for payment of fees as contained herein are not met.

All the regulations in this section may not apply to Graduate Students. Please refer to the [Faculty of Graduate Studies](#) section of the Graduate Calendar.

# Student Accounts Office

## Location:

Henry Hicks Academic Administration Building, Room 29  
6299 South Street  
PO BOX 15000  
Halifax NS  
B3H 4R2

Phone Number: 902-494-3998

Fax Number: 902-494-2839

Email Address: [student.accounts@dal.ca](mailto:student.accounts@dal.ca)

Website: [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca)

## Student Accounts Office

## University Regulations

The following general regulations are applicable to all payments made to the University in respect of fees. Please refer to our website for additional information on payment options: [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca).

- Fees must be paid in Canadian funds by online bank payment, interac, negotiable cheque or money order.
- Money transferred to a student's account are not to exceed the annual charges associated with tuition and ancillary fees. Funding for off-campus and personal expenses is to be sent directly to the student. Overpayment on a student's account may result in funds being withheld and applied toward future term fees for up to one academic year.
- If payment by cheque is returned by the bank as non-negotiable, there will be an additional fee of \$20 and the account will be considered unpaid. Furthermore, if the bank returns a cheque that was to cover payment of tuition, the student's registration may be cancelled and, if permitted to re-register, a late fee will apply.
- Accounts in arrears must be paid by certified cheque, money order or interac prior to registration in a future term.

### Admission Deposits

A non-refundable deposit of \$200 is payable on acceptance to all new undergraduate and graduate programs. Undergraduate students admitted by April 20 are required to pay the deposit by May 15. Undergraduate students accepted after April 20 must pay the deposit within three weeks of receiving an offer of admission. Graduate students must pay the deposit within four weeks of receiving an offer of admission.

Undergraduate Medicine and Law students are required to pay a \$500 non-refundable, admission deposit.

International Dentistry, Qualifying Dentistry and Internetworking students are required to pay a \$2,500 non-refundable admission deposit.

Admission deposits are later credited towards tuition fees for the applicable term.

### Registration

A student is considered registered after selection of course(s).

Selection of course(s) is deemed to be an agreement by the student for the payment of all assessed fees.

Nonattendance does not constitute withdrawal. Students must ensure that they cancel registration in all courses if they choose to withdraw.

### Identification Cards (DalCard)

All full and part-time students should obtain identification cards following registration in the current year. ID cards are valid until August 31. If a card is lost, a fee of \$15 is charged for a replacement.

### Audit Courses

All students auditing a course pay one-half of the regular tuition fee plus full auxiliary fees, if applicable. In such cases, the student is required to complete the usual registration process.

A student who is registered to audit a course, who during the session wishes to change their registration to credit, must receive approval from the Registrar. This must be done on or before the last day for withdrawal without academic penalty. The same deadline applies for a change from credit to audit. Graduate students please see Section 6.6.4 for audit information.

### ***Late Registration***

Students are expected to register on or before the specified registration dates. Students wishing to register after these dates must receive the approval of the Registrar. A late registration fee of \$50 will apply if registration and payment of fees has not been completed by specified dates. This fee is payable at time of payment and will be in addition to regular fees.

### ***Course Changes and Withdrawals***

Please consult Student Accounts for all financial charges and the Registrar's Office for academic regulations.

Students withdrawing from all courses must submit written notification to the Registrar's Office. Nonattendance does not constitute withdrawal; you must ensure courses are dropped. Refunds due to class withdrawals will be effective the date a course(s) is dropped online at [dalonline.dal.ca](http://dalonline.dal.ca) or written notification is received at the Registrar's Office. Please contact Student Accounts to have your refund processed.

In the Faculty of Health, students who wish to withdraw from the University must obtain written approval from the appropriate school or college and submit the appropriate forms to the Registrar. Students in these faculties should continue to attend classes until their withdrawal has been approved.

### ***Academic Fees***

Upon approval of the 2021/2022 academic fees, a complete schedule showing the payment dates will be available in June 2021 at [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca). Students are advised that fees are subject to change by approval of the Board of Governors, and it is likely that tuition and fees will increase during each year of study.

NOTE: Students registered in more than one program are required to pay separate academic fees for each program. Additional course specific auxiliary fees may apply, as well as fees for online courses or programs related to distance delivery.

### ***Fee Schedule***

2020/2021 approved tuition rates provided as information only.

Degree Program	Program Fee	Per Course Fee
<b>UNDERGRADUATE</b>		
Architecture, Community Design		846.60
Arts and Social Sciences		810.30
Computer Science		919.20
Dentistry		
Dentistry	27,039	
Dental Hygiene Diploma	10,122	
Dental Hygiene Degree		1,024.20
International and Qualifying	54,114	
Engineering		1,005.30

## Health

Disability Management Diploma	900.00
Emergency Health Services Management Diploma	700.00
Health Science	943.80
Health Services Administration	919.20
Kinesiology	943.80
Nursing	989.70
Pharmacy, BSc.	1,081.50
Pharmacy, Doctorate	1,395.00
Recreation & Health Education	943.80
Social Work	895.50

Law	15,978
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## Management

Commerce	927.90
Management	815.40

## Medicine

MD	22,050
Post-Graduate	3,357

Science	919.20
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Sustainability	919.20
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## GRADUATE

### Masters

Agriculture	9,753
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## Architecture and Planning

Architecture (Post-Professional)	9,753
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Architecture		975.90
Environmental Design Studies	9,753	
Planning		1,024.20
Planning Studies	9,753	
Arts and Social Sciences	8,580	
Computer Science	9,753	
Dentistry		
MD/MSc (Oral and Maxillofacial)	27,813	
Periodontics	22,179	
Digital Innovation	16,500	
Electronic Commerce	10,812	
Engineering, Applied Science, Biomedical Engineering & Food Science	9,753	
Engineering - Internet Working (per class)		2,070
Health Informatics	10,812	
Health		
Applied Health Services Research	8,706	
Communication Sciences & Disorders (Years 1 and 2)	12,246	
Communication Sciences & Disorders (Year 3)	10,144	
Clinical Vision Science	10,569	
Health Promotion, Leisure Studies	9,753	
Health Administration		983.10
Kinesiology and Nursing	10,569	
Pharmaceutical Sciences	12,246	
Occupational Therapy		

Entry Level	14,223	
Post Professional	12,246	
Physiotherapy		
Entry Level	14,223	
Rehabilitation Research	12,246	
Social Work		947.40
Law	8,580	
Management		
Business (MSc)	9,753	
MBA Corporate Residency	25,552	
Environmental Studies	8,676	
Information, Information Studies		1,080.90
Public Administration		859.20
Resource and Environmental Management		859.20
Medicine		
Community Health & Epidemiology	10,569	
Medicine - Except Community Health & Epidemiology	9,753	
Science	9,753	
Marine Management	8,676	
<b>Doctorate</b>		
<b>Cohorts Entering Fall 2020</b>		
Arts and Social Sciences	4,269	
All Other Doctorate Programmes	6,330	
<b>Cohorts Entering Prior to Fall 2019</b>		

Agriculture	10,191
Arts and Social Sciences	8,994
Computer Science	10,191
Engineering, Applied Science & Biomedical Engineering	10,191
Health	10,191
Law	12,435
Medicine	10,191
Nursing	11,001
Science	10,191

#### **Continuing Fee**

All Programs	2,664
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#### **International Students**

##### **Additional International Tuition Fee -**

##### **Cohorts Entering Fall 2020**

All Programs except Graduate Thesis-based *	13,077
Graduate Thesis-based Programs (PhD, International Dentistry, Qualifying Dentistry, and Internetworking are exempt)	6,972

##### **Cohorts Entering Prior to Fall 2019**

All Programs except Graduate Thesis-based *	10,089
Graduate Thesis-based Programs (PhD, International Dentistry, Qualifying Dentistry, and Internetworking are exempt)	6,972
International Health Insurance	728 per year

#### **Agricultural Campus**

Degree (undergraduate)	858.60
Technical	454.60
Introductory Studies	417.20
Veterinary Technology	611.40



Note: Per course fees are based on a three-credit hour course. Complete fee schedules are available online [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca). The online fee schedule is expected to be updated by June 2021 with approved academic fees for 2021/2022.

\* International students are required to pay an International Tuition Fee in addition to tuition.

### ***Exchange Students***

Outbound exchange students whose fees are paid to Dalhousie University will be assessed tuition and fees for 15 credit hours for the faculty of their degree.

## **International Students**

### ***Additional International Tuition Fee***

Registered students, who are not Canadian citizens or permanent residents are required to pay an Additional International Tuition Fee to a maximum of \$6,538.50 per term, subject to increase in 2021/2022. The rate for students returning in 2020/21 to their 2018/2019 programme of study is \$5,044.50 per term or \$6,972 per year for those in thesis-based graduate programmes. There is a proportional charge for part-time international students. International Dentistry, Qualifying Dentistry and Internet working students are exempt, as are PhD students who were admitted for September 2019 onwards. Graduate Students please refer to [Section 5.7 of the Graduate Studies Calendar](#) to determine the number of years a student is required to pay the international tuition fee.

If a student receives permanent resident status, the Additional International Tuition Fee will not be assessed for the current term and beyond. In order to process a retroactive reimbursement of differential fees in a current term, acceptable proof of residency must be submitted to the Registrar's Office prior to the last business day of December, April, and August for each term.

### ***Health Insurance***

International students will be charged for an International Student Health Insurance Plan when they register. If a student already has sufficient, comparable health coverage, they can apply to opt out of the International Student Plan at the DSU Health Plan Office before September 17, 2021. More details on the international student health plan costs, coverage and the opt-out process can be found at [www.dsu.ca](http://www.dsu.ca). Full-time international students will also be assessed the extended DSU Health and Dental plans.

Health Insurance - International Students (2020/2021 rates, for information only)

- Single - \$ 728 per year
- Family - \$1,832 per year

## **Student Fees**

In addition to tuition and course related fees, the following mandatory incidental fees may apply. These fees are non-refundable beyond the due date for each term. In cases of late cancellations or retro-active withdrawal, the mandatory incidental fees remain payable. Rates provided as information only, subject to change for 2021/2022.

### ***Student Union Fee***

Every student registered at Dalhousie is a member of the Student Union and required to pay a Student Union fee as part of their registration procedure. These fees have been approved by students in referenda and, along with other revenue of the Union, are allocated each year by the Student Council budget.

For information only, 2020/2021 full-time Student Union fees are \$77.28 per term.

### ***Health and Dental Insurance***

Each Fall term, full-time students are assessed the DSU Health and Dental Plan that provides extended coverage from September through August. The current rate is \$464 per year.

Students with separate health insurance may apply to the DSU for reimbursement. For more information, please contact the DSU Health Plan Office, Student Union Building (SUB), Room 344, Phone: (902) 494-2850 or visit their website at [www.dsu.ca](http://www.dsu.ca).

### ***Student Service Fee***

Student Service provides and supports various Dalhousie Services including health services, academic support and athletics. For information only, 2020/2021 Student Service fee is \$167.40 per term for full-time students.

The following services will be provided without additional charges unless specified:

- Change from Audit to Credit
- Confirmation of Enrolment
- Confirmation of Fee Payment
- Dalplex Membership
- Leave of Absence Fee
- Letter of Permission
- Replacement Tax Receipt
- Transcripts (maximum of five requested at one time)

### ***Facilities Renewal Fee***

All students are assessed a facilities renewal fee of \$94.90 per term; \$31.50 per term for part-time students. Full-time, Halifax students are also assessed a recreation renewal fee of \$90 per term (to a maximum of \$180 per year) which supports athletic facilities. Students in the Faculties of Engineering, Architecture and Planning also pay a Sexton Campus Facilities Renewal Fee of \$100 per term which supports the IDEA Building.

2020/2021 rates provided for information only and are subject to increase upon approval of the Board of Governors.

### ***University Bus Pass Fee (UPass)***

All eligible, full-time students will receive a Metro-Transit bus pass (UPass). The fee in 2020/2021 is \$162.70 and is effective September through April. Please refer to [www.upass.dal.ca](http://www.upass.dal.ca) for further information. Eligibility for the summer UPass program is determined by summer term registration and as information, the rate for Summer 2021 is \$81.35

### ***Laboratory Deposits***

A deposit for the use of laboratory facilities in certain departments is required. The deposit is determined and collected by these departments. Students will be charged for careless or willful damage regardless of whether a deposit is required.

### ***Additional Student Fees***

Departments may also charge additional fees on a cost recovery basis not included in the fee schedule. Examples include, but are not limited to, print, or copy fees, transportation costs and material fees. Students registered in online courses and distance programs will be assessed additional fees for delivery of these courses.

Miscellaneous fees are charged as outlined in the table below.

### ***Miscellaneous Fees 2020/2021***

Fee	Amount	Payable at
Late Registration	\$50	Student Accounts
Reinstatement Fee	\$50	Student Accounts
Returned Cheque	\$20	Student Accounts
Admission Deposit	\$200	Student Accounts
Undergraduate Medicine Admission Deposit	\$500	Student Accounts
Application Fee - Undergraduate	\$70	Registrar
Application Fee - Graduate	\$115	Registrar
Late Graduation Application	\$50	Registrar
Replacement ID	\$15	DalCard Office
Replacement Bus Pass	\$15	DalCard Office or Student Accounts
Transcript	*\$5	Registrar
Fax Fees		
Metro	\$5	Registrar
Canadian	\$10	Registrar
International	\$15	Registrar
Residence Application Fee	\$50	Residence

\* Where appropriate, contact Registrar's Office for details Note: Fees are subject to change after publication of this calendar.

## Statements and Monthly Notices

Students with current activity will be issued electronic statements. Students will be notified through their official Dalhousie email account when a new statement is available. Subsequent monthly payment reminders will be sent to the student's official Dalhousie email address. Refer to [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca) for more information.

## Release of Student Financial Information

University policy recognizes the financial account as belonging to the student and therefore, to protect student privacy, account information is considered confidential. For more information on granting permission for financial information to be released to a third party (such as a parent), please contact Student Accounts at (902) 494-3998 or in Truro at (902) 893-6361 [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca).

## Payment

The payment of academic fees will be received at the Student Accounts Office located in the Henry Hicks Academic Administration building, the Enrolment Services Centre on Sexton Campus or the Enrolment Services Centre, Truro.

For the convenience of students, Canadian cheques, and money orders, payable to Dalhousie University, are accepted by mail. Fees paid by mail must be received by Student Accounts on or before the term due date to avoid late payment and/or delinquency charges.

The following regulations apply to the payment of academic fees. For further information on regulations regarding withdrawal of registration, please refer to II.K:

- a. **All** students must pay the applicable deposit in accordance with Section A.
- b. Those holding external scholarships or awards paid by, or through, Dalhousie must provide documentation of the scholarship or award before term fees are due.
- c. Those whose fees are paid by a government (or other agency) must have the third-party billing form completed and submit to Student Accounts by September 17 or January 14 for the respective term. This form is available online at: [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca)
- d. Those paying the account balance by Canada Student Loan must negotiate the loan by September 17 or January 14 for the respective term. Interest will be charged after these dates and a late registration fee will apply.
- e. Those whose fees are paid by Dalhousie University staff tuition fee waiver must present the appropriate waiver form and pay applicable incidental fees by September 17 or January 14, for the respective term.
- f. Those who are Canadian citizens (or permanent residents), 65 years of age (or over) and enrolled in an undergraduate degree program will have their tuition fees waived but must pay the applicable incidental fees.
- g. Scholarships or awards paid by, or through, Dalhousie University will be applied to academic and residence fees.
- h. When a Canada Student Loan, provincial loan or co-payable bursary is presented at the Student Accounts Office, any unpaid charges will be deducted.
- i. Fees cannot be deducted from salaries paid to students employed at Dalhousie University.
- j. Any payments made to a student account is first applied to past due balances.

## Canada Student Loans

Students planning to pay by Canada Student Loan should apply to their province in April or May so that funds will be available by the time payment is required. The University will deduct fees/charges from the loan at the time of endorsement. Please contact the appropriate provincial office to determine eligibility as well as course load requirements. A late fee of \$50 will apply if the loan is negotiated after September 17, 2021. (January 14, 2022, for students registered for Winter Term and May 16, 2022, for students registering for the summer term).

## Provincial Bursaries and University Scholarships

These cheques are distributed by the Student Accounts Office. Any unpaid fees and/or temporary loans along with charges, if applicable, are deducted and payment will be issued following endorsement for any balance remaining. A valid Dalhousie University ID and Social Insurance Number must be presented in order to receive cheques. Please contact the appropriate provincial office to determine eligibility as well as course load requirements for provincial bursaries.

For more information on student loans, bursaries or scholarships, inquiries should be directed to the Registrar's Office, Henry Hicks Academic Administration Building, Room 130.

## Receipts

The amount of academic fees constituting an income tax credit is determined by Canada Revenue Agency.

A special income tax certificate (T2202) will be available annually through Web for Student at [dalonline.dal.ca](http://dalonline.dal.ca) no later than February 28 for the prior calendar year.

## **Refunds**

Students withdrawing from all courses must submit written notification to the Registrar's Office. Non-attendance does not constitute withdrawal; you must ensure courses are dropped. Refunds due to course withdrawals will be effective the date a course(s) is dropped online at [www.dalonline.dal.ca](http://www.dalonline.dal.ca) or written notification is received at the Registrar's Office. Please contact Student Accounts to have your refund processed.

In the Faculty of Health Professions, students who wish to withdraw from the University must obtain written approval from the appropriate school or college and submit the appropriate forms to the Registrar. Students in these faculties should continue to attend class until their withdrawal has been approved.

### ***Refund Conditions***

Refunds will be processed as follows:

- a. Based on the withdrawal date, tuition is refunded based on percentages outlined in the refund schedule at: [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca)
- b. No fee adjustment will be made for a student changing their degree or program as follows:

Regular (Sept - April) and Fall Terms: After September 17, 2021

Winter Term: After January 14, 2022

Summer Term: After May 16, 2022

- c. No refunds will be made for 30 days when payment has been made by personal cheque or 60 days for a cheque drawn on a bank outside of Canada.
- d. Refunds will be made to the appropriate Student Loan service provider if a student has paid with a student loan and no longer meets eligibility criteria.
- e. A student who is dismissed from the University, for any reason, is not entitled to a refund of fees.
- f. Refunds will be prorated on fees paid by Dalhousie scholarships and/or tuition waiver.
- g. A valid Dalhousie University ID must be presented in order for a student to collect a refund cheque.

### ***Refund Schedule***

The most current version of the refund schedule is available at [www.moneymatters.dal.ca](http://www.moneymatters.dal.ca).

### ***Important Information Regarding Refunds***

- A portion of fees as outlined in the refund schedule will be assessed if withdrawal from a course occurs after September 17 (Fall Term) and January 14 (Winter Term). Withdrawals before these dates will be completely refunded, but no substitutions will be allowed from a financial perspective after these dates
- Non-attendance does not constitute withdrawal and in cases of a backdated withdrawal, mandatory incidental fees remain payable.
- Students at the University of King's College should refer to college refund policies at [www.ukings.ca](http://www.ukings.ca)
- For financial charge inquiries, contact Student Accounts at (902) 494-3998 or

[student.Accounts@dal.ca](mailto:student.Accounts@dal.ca)

## **Delinquent Accounts**

Accounts are considered delinquent when the balance of fees has not been paid by September 17 for the Fall Term or January 14 for the Winter Term.

Interest, at a rate set by the University, will be charged weekly on delinquent accounts for the number of days overdue.

Effective July 1, 2020, the rate of interest is 5.45% per annum, compounded monthly.

A student whose account is delinquent for more than 30 days will be denied University privileges including access to transcripts. A student will be reinstated upon payment of the fees outstanding, the arrears interest and a \$50 reinstatement fee. Students will not be permitted to register in future terms until all outstanding amounts are paid in full. Subsequently, if the bank does not honour the payment, the student may be deregistered.

Graduating students whose accounts are delinquent on April 15 will not receive their degree/diploma parchment. For fall graduation the deadline is September 1. Transcripts are withheld until payment is received in full.

Accounts which become seriously delinquent may be placed in collection or further legal action may be taken against the individual. Students will be responsible for charges incurred as a result of such action.

## Residence Fees

### Residence Communications

All residences are wired for high-speed Internet/wireless, local telephone service and cable TV access.\* The cost is included in residence fees. Check out the website at [www.dal.ca/rescomm](http://www.dal.ca/rescomm).

\*These services are subject to change.

### COVID-19 Advisory

Our residence offerings for 2021/22 will be dependent upon any COVID-19 response. Thank you in advance for your understanding during these uncertain times. Your health and safety will always be our top priority. Learn more at our [COVID-19 Info](#) page.

### Residence Fees

Residence rates vary depending on the location and style of accommodations available. For up-to-date residence options and rates, please visit [dal.ca/residence](http://dal.ca/residence). All residence rates include high-speed Wi-Fi and a TV / entertainment streaming package. Rates **do not** include the non-refundable \$50 Residence Application Fee.

It is important to note that traditional residences have a mandatory meal plan; however, there are several options available for students. Traditional residences on the Halifax campuses include: Howe Hall, Risley Hall, Shirreff Hall, Gerard Hall, LeMarchant Place and Mini Res. Traditional residences on the Truro campus include: Chapman House, Fraser House, and Trueman House. Non-traditional residence options on the Halifax campuses include: Glengary Apartments and the Grad House. On the Truro campus a section of Trueman House is reserved for non-traditional accommodations. Meal plans are not required in non-traditional residences but are recommended. For up-to-date meal plan options and rates, please visit [dal.ca/foodserves](http://dal.ca/foodserves).

Important:

- Once offered admission to an academic program of study at Dalhousie, students are eligible to submit a residence application. **Application can be made within 2-3 business days of the \$200 admission deposit being paid.**
- Students must be registered full-time at Dalhousie to apply to residence.
- No refund will be made to any resident who is dismissed for misconduct. Discretionary power in exceptional circumstances remains with the Director, Residence Operations, in conjunction with the Director, Residence Life or their designates.
- All residence students, new and returning, who have received notification of their room assignment, must pay a \$500 deposit to confirm their acceptance. The deposit is due within the time frame specified by the Residence Office.
- \$250 of the \$500 deposit is refundable if cancellation is received prior to August 1. No refunds are made after August 1.
- The \$500 residence confirmation deposit can be paid by credit card (Mastercard, Visa, Amex) by visiting [dal.ca/admissions.html](http://dal.ca/admissions.html). For more payment options, please visit [dal.ca/admissions.html](http://dal.ca/admissions.html).
- No residence room will be held based on post-dated or “insufficient fund” cheques.
- Deposits or fees cannot be deducted from scholarships, fellowships, or similar awards.
- Residence agreements are for eight-month terms (September – April). Please note, residences close during the December break.

### Residence Term

The residence term commences the Saturday prior to Labour Day and ends on the last day of the examination period in April. Students must vacate the residence 24 hours after their last exam and residences are closed over the December break.

If required, an additional fee is payable by all residents who are registered in a faculty where the academic session commences before or continues after the session of the College of Arts and Science. Special arrangements are to be made with the Residence Office for accommodation for periods prior to or following the session as defined above.

### **Payment of Residence Fees**

Payment may be made in full at registration or in two instalments. The first instalment must be paid in full by September 17, 2021. Interest is assessed weekly at a rate as set by the University and will be charged on all accounts outstanding after September 17, 2021 and on any second instalment outstanding after January 14, 2022. The student will not be permitted to register for another session until all accounts are paid in full. A student whose account is delinquent for more than 30 days will be denied university privileges including access to transcripts. The student will be reinstated upon payment of the fees outstanding, the arrears interest, and a \$50 reinstatement fee. For additional information regarding outstanding or delinquent accounts, please see II. Fees, Section K.

All residence fees can be paid at the Student Accounts Office, the Student Service Centre (Sexton Campus), or online at [www.dal.ca/admissions.html](http://www.dal.ca/admissions.html).

Students should make an appointment as soon as possible with the Assistant Manager of Student Accounts if they are having financial difficulties.

### **Residence Communications**

All residences include high-speed Wi-Fi \_\_\_33 and a TV/entertainment package.\* The cost is included in residence fees.

*\*These services are subject to change.*

Find out more: [dal.ca/residence](http://dal.ca/residence)

Email: [residence@dal.ca](mailto:residence@dal.ca) (Halifax Campus) [resdalac@dal.ca](mailto:resdalac@dal.ca) (Agricultural Campus)

Phone: 902-494-1054 (Halifax Campus) 902-893-7519 (Agricultural Campus)

## **Awards**

### **Scholarships and Fellowships**

#### **General Disciplines**

Each department has a limited number of scholarships available for students pursuing a degree program on a full-time basis. Scholarships are not offered to anyone on leave from a job with salary continuation. Those wishing to be considered for scholarship assistance are advised to contact the Graduate Coordinator in the department to which they are applying for details on eligibility and deadlines (NOT the Faculty of Graduate Studies). Graduate Coordinator contact information can be found at [dalgrad.dal.ca/programs/](http://dalgrad.dal.ca/programs/).

In general, Faculty of Graduate Studies Scholarships will be paid to the student in regular monthly payments on the 27<sup>th</sup> of each month, after university tuition and fees have been deducted. Payments are made by automatic bank deposit. Deposit advice statements are available on DalOnline. Where warranted, with permission of the Dean of Graduate Studies, a student may receive scholarship funding for a maximum of 12 months while pursuing research off-campus.

Very well qualified scholars who receive awards from federal agencies may also receive Dalhousie supplements within the limits set down by the Faculty of Graduate Studies and/or agencies offering the awards.

There are no appeals on decisions on scholarships, grants or bursaries.

#### **External Scholarships**

There are numerous scholarships available from external funding agencies that can be held by students pursuing graduate studies at Dalhousie (and other Universities). A database containing information about these scholarships is available at [dalgrad.dal.ca/currentstudents/funding/external](http://dalgrad.dal.ca/currentstudents/funding/external).

## **Bursaries**

### **General Information about Bursaries**

Canada Student Loans (with or without provincial bursaries and/or loans) are expected, by provincial authorities, to meet the financial deficiencies of the students. Bursaries subsequently awarded by the University must be reported and are liable to be deducted (in part or in whole) from the amounts originally allocated under the Canada Student Loan Plan or provincial aid program.

### **Government Notification**

Holders of Dalhousie University bursaries should note that the University is required, upon written request, to report its award winners to the respective Provincial Student Aid Authority.

### **Faculty of Graduate Studies Emergency Bursaries**

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs.

Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered.

Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Awards are for a maximum of \$1,000, lower amounts may be awarded. Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal.

The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

## **Research and Travel Grants**

### **Research Grants**

Research grants to assist thesis research are available for PhD graduate students in disciplines where such funding would not be available through the research grant(s) of their supervisor or through external grants or awards to the student. In most cases this will be for minor research expenses in disciplines covered by the mandate of the Social Sciences and Humanities Research Council (SSHRC). Students in other disciplines may also apply to the Faculty of Graduate Studies for research grants but in all cases Faculty of Graduate Studies grants can be awarded only when the student has not secured external funding, the supervisor does not have research grant support and no funding is available from the department.

Guidelines and application forms are available on the Faculty of Graduate Studies website at [dalgrad.dal.ca/currentstudents/funding/grants](http://dalgrad.dal.ca/currentstudents/funding/grants). If applicable, students must secure Ethics approval for their research. Further information is available from the Office of Research Ethics Administration Website at [http://researchservices.dal.ca/research\\_7776.html](http://researchservices.dal.ca/research_7776.html). Students may simultaneously apply for a research grant and ethics approval; however, funds will not be approved until Ethics Approval has been received. Research grants will be established under their supervisor's signing authority.

### **Conference Travel Grants**

Conference travel grants can be awarded to graduate students in thesis programs. In order to be eligible, students must be presenting a poster or paper based on their current program thesis research at a scholarly meeting or conference.

A letter of acceptance from the conference organizers, or a copy of the conference program must accompany the application. The letter of acceptance or conference program must include the name of the applicant, the title of the poster or paper to be presented, and the dates and location of the conference. Department approval must be given to applications.

Travel costs can be claimed only for travel from Halifax to and from the location of the conference and must be based on the lowest available fares. For conferences held in Nova Scotia only registration costs can be claimed, travel costs and per diem costs are not eligible.

Applications must be received in the Faculty of Graduate Studies office a minimum of one month in advance of the conference. Applications will not be accepted retroactively or for a conference that occurs in the term following the completion of their degree requirements.



Students are eligible to apply for one travel grant during the period of their graduate degree program at Dalhousie.

Guidelines and application forms are available on the Faculty of Graduate Studies website at [dalgrad.dal.ca/currentstudents/funding/grants](http://dalgrad.dal.ca/currentstudents/funding/grants).

## Killam Postdoctoral Fellowships

Killam funds provide for postdoctoral fellowships in many fields of study. The annual stipend is \$45,000 including certain benefits plus travel and research grants. There are no restrictions regarding nationality of applicants, but non-Canadian candidates must meet all Canadian Immigration requirements. Qualifying applicants should have recently completed a PhD degree at a recognized university and should not hold a permanent academic position to which they will return. Since these Fellowships are intended to attract new scholars to Dalhousie, scholars already at Dalhousie are not eligible to apply, including Dalhousie PhDs, Dalhousie or King's employees, and researchers in residence at Dalhousie or King's with external sources of funding. These awards may be taken up between May 1st and January 15th. Fellows may engage in limited teaching duties in the University. Completed applications and supporting documents must be submitted to the Department in which the applicant wishes to work, no later than December 15th. The results of the competition are usually announced in mid-February, and all applicants nominated by their department are notified of the results.

## Awards on Graduate Transcripts

A select number of scholarships and awards are recorded on the official Dalhousie transcript for graduate students. The list of such scholarships and awards is available from the Faculty of Graduate Studies.

## Entrance Awards

### *Faculty of Agriculture Association of Graduate Students Bursary*

Any graduate student of the Faculty of Agriculture is eligible to apply (any year; full time or part time). This award is selected based on financial need. Eligibility: Available to graduate students in the Faculty of Agriculture. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Department, School, or College for more information

### *The Architects' Association of New Brunswick Scholarship*

This scholarship for a student entering the Master of Architecture program was established by colleagues to the Heinz Fleckenstein Memorial Fund, with additional contributions from the AANB and Dalhousie Architecture Alumni.

Eligibility: The scholarship is awarded to a student who is a permanent resident of New Brunswick. The recipient must demonstrate strong design ability with functional solutions, and an aptitude and knowledge in areas beyond design.

Application Type: Automatic Consideration – No Application Required

Value: \$1,000

### *Black Business Initiative (BBI) Entrance Scholarship*

The BBI Entrance Scholarship is awarded to one black Nova Scotian enrolled in the Corporate Residency MBA program.

Eligibility: Candidates must be entering the Corporate Residency MBA program, have lived in Nova Scotia for the past 24 months, have demonstrated academic excellence, strong citizenship, character, and a desire to make a meaningful contribution to the community.

Application Type: Contact the Department, School, or College for more information

Value: \$10,000

### *Centre for International Business Studies First Year Graduate Scholarship*

One scholarship is offered to a first year MBA student majoring in International Business. The scholarship recipient is selected on the basis of a career interest in international business and academic performance.

Application Type: Contact the Department, School, or College for more information

Value: \$1,000

### *Chartwells Graduate Student Scholarship*

Awarded to a student entering the Master of Science degree program in the Faculty of Agriculture on a full-time basis. The scholarship will be awarded on the basis of academic performance.

Application Type: Automatic Consideration – No Application Required

### *Design and Construction Institute Engineering and Architecture Scholarship*

This scholarship is awarded to a student who shows a commitment to pursuing a career in the design and construction industries in Nova Scotia. The selection will be based on academic achievement.

Eligibility: A student entering the first year of the Master of Architecture program



Application Type: Automatic Consideration – No Application Required  
Value: \$500

#### ***Shirley B. Elliott Scholarship***

Shirley Burnham Elliott's mother was the first professionally qualified librarian in Nova Scotia. Following in her mother's footsteps, Ms. Elliott obtained her library science degree from Simmons College (Boston) in 1940. In 1954 Shirley became Nova Scotia's Legislative Librarian and, during the following 28 years, transformed that library and its services into a modern research library. In 1985 Shirley was awarded an honorary Doctor of Laws degree from Dalhousie; in 2003 she was awarded the Order of Nova Scotia. The Shirley B. Elliott Scholarship is competitive. The minimum grade required to be considered for the Shirley B. Elliott Scholarship is A- (3.70 GPA).

Eligibility: Awarded to an incoming full-time Master of Library and Information Studies student on the basis of academic merit.

Application Type: Automatic Consideration – No Application Required

#### ***Exxon Mobil Canada Ltd. Post-Graduate Scholarship***

Awarded to an entering graduate student accepted to an advanced research degree in the Faculty of Engineering based on undergraduate academic record. Preference is given to Canadian citizens and permanent residents.

Eligibility: Available to an entering graduate student in the Faculty of Engineering.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline: May 31

#### ***FGS Scholarships***

Each department has a limited number of scholarships available for students pursuing a degree program on a full-time basis. Scholarships are not offered to anyone on leave from a job with salary continuation. Those wishing to be considered for scholarship assistance are advised to contact the graduate coordinator in the department to which they are applying for details on eligibility and deadlines. Maximum eligibility for scholarships is two Master's years and the first five Doctoral years, but some departments may have a shorter period.

Application Type: Contact the Department, School, or College for more information

#### ***Fountain Graduate Fellowships in Music***

Fountain Graduate Fellowships have been created in honour of the establishment of the Fountain School of Performing Arts. Applicants to the MA in Musicology program with an academic standing of at least an A- should contact the Graduate Coordinator, Fountain School of Performing Arts, for additional information.

Eligibility: Students entering the MA in Musicology program.

Application Type: Contact the Department, School, or College for more information

Value: \$15,000

#### ***The Gerald and Margaret Godsoe Scholarship***

Established by the Godsoe family to support a highly qualified and motivated individual entering the Master of Environmental Studies (MES) program at Dalhousie. The recipient must hold an honours degree in Natural or Social Sciences, Engineering, Architecture or its equivalent, with first-class standing in his/her course of study or have proof of exceptional merit. Further, the recipient must have made significant contributions through community service, leadership, and education on environmental issues. Eligibility is limited to Canadian citizens and permanent residents of Canada living in the country. The recipient will be selected by the Admissions Committee at the School for Resource and Environmental Studies. Students wishing to be considered for this award must append a clearly marked, separate typewritten page to the admission application containing a brief description of activities and community involvement in environmental issues.

Application Type: Contact the Department, School, or College for more information

#### ***Mary and John Eldon Green Scholarship***

The Mary and Eldon Green Scholarship was established to sustain the pioneering legacy of John Eldon Green and is awarded annually to two Prince Edward Island Masters students, one admitted to enter the School of Social Work and the other to enter the MSc (OT) "entry to practice" program in Occupational Therapy at Dalhousie University. Awards will be presented to the highest ranked student who is a resident of Prince Edward Island on entering each of the two programs.

Application Type: Contact the Department, School, or College for more information

#### ***The Professor F. Ronald Hayes International Scholarship***

This scholarship fund was established in memory of Professor F. Ronald Hayes, founder and first director of the Institute of Oceanography of Dalhousie University, and in commemoration of the Joint Oceanographic Assembly which was held at Dalhousie during August, 1982. The purpose of the scholarship is to provide financial support. The recipient will be nominated through the normal screening process by the Departmental Graduate Admission Committee.

Eligibility: Available to students entering the first year of the Master of Science or Doctor of Philosophy programs in Oceanography at Dalhousie University. Applicants must be from a developing country.

Application Type: Contact the Faculty of Graduate Studies for more information

***The D. O. Hebb Post-Graduate Prize***

To honour the memory of Donald Olding Hebb (BA 1925), Professor Emeritus (1977-1985), the Psychology Department established the D. O. Hebb Post-Graduate Prize, which is awarded by the Graduate Program Committee, to an entering Masters and/or PhD student who has demonstrated the best potential to make a significant scientific contribution to the field of Psychology.

Application Type: Contact the Department, School, or College for more information

Value: \$1,000

***School of Information Management Alumni Award***

The Alumni Scholarship is sponsored by SIM's Associated Alumni. The Alumni Scholarship is competitive. The minimum grade required to be considered for the SIM Alumni Scholarship is A- (3.70 GPA).

Eligibility: Awarded to an incoming full-time MLIS student who has achieved high academic standing, and demonstrated an interest in the profession, and/or experience working or volunteering in the field, through his/her admission essay.

Application Type: Automatic Consideration – No Application Required

***School of Information Management New Brunswick Award***

The SIM New Brunswick Award was created to support students from New Brunswick who are pursuing the MLIS or combined degree. The SIM New Brunswick Award is competitive. A New Brunswick (NB) student is defined as an individual who declares a NB address on their application. Such an applicant will be an individual who was born in NB, or is a resident of NB, and/or completed high school or a university degree in NB. The minimum grade required to be considered for the SIM New Brunswick Award is A- (3.70 GPA) in the last two years of undergraduate study.

Eligibility: Awarded to an incoming full-time Master of Library and Information Studies student from New Brunswick on the basis of academic merit.

Application Type: Automatic Consideration – No Application Required

***School of Information Management Student Assistantships***

SIM's Student Assistants provide support, to a maximum of 60 hours per year, to one or more SIM faculty or staff members.

Eligibility: Awarded to incoming full-time Master of Library and Information students on the basis of academic merit.

Application Type: Automatic Consideration – No Application Required

***International Student Awards***

Awarded to international students admitted to the MSc program. Awards are given based on academic merit and financial need.

Eligibility: Available to international students entering the Master of Science program in the Faculty of Agriculture at Dalhousie.

Application Type: See [dal.ca/scholarships](http://dal.ca/scholarships) for more information

***Barry Johns Scholarship for Design***

This scholarship, donated by Barry Johns (BArch 1972), is awarded to the student entering the Master of Architecture program who completed the entire BEDS program at Dalhousie University with the highest average grade in Design courses.

Application Type: Automatic Consideration – No Application Required

Value: \$1,000

***Patricia Keene Scholarship in English***

Awarded to deserving students in English in memory of Patricia (Pat) Keene (1924 - 2006).

Application Type: Automatic Consideration – No Application Required

***Killam Predoctoral Scholarships***

Killam scholars are selected on the basis of nominations made by departments. It is required that nominees also have applied directly for or been nominated for funding from relevant national or international agencies for which they are eligible. Canadian students are eligible for nomination for the Killam Scholarships only if they have applied directly for or been nominated for the relevant national scholarship (NSERC, SSHRC, CIHR, etc.). Only those students registered in a program with a thesis requirement are eligible to hold the Killam Predoctoral Scholarship. Killam scholarship holders must be eligible to receive scholarship support for at least two years. This means that at the Masters level only newly entering students will be considered. Renewal is upon evidence of satisfactory performance at a required minimum level. Masters students may hold a Killam Scholarship for 24 months and Doctoral students for up to 36 months except when holding an honorary award. Then the scholarship can be held for 48 months (only if no Master's Killam was held). The scholarships will be valued at \$20,000 for a Master's program and \$30,000 for a Doctoral program. Tuition/fees are not waived and must be paid out of the award, but additional funds to assist with transportation to Halifax, and differential fees for foreign students will be supplied. Killam scholars may perform instructing or demonstrating duties, and, if they do, will be given additional remuneration for these services through the employing department. Killam scholarships are open to both Canadians and non-Canadians. PLEASE NOTE: Candidates do not apply for these scholarships. On the basis of the information in a completed application for admission the graduate department concerned may nominate the student to the selection committee. Contact the department Graduate Coordinator for further information.

Application Type: Automatic Consideration – No Application Required

Value: \$20,000 (Master's) and \$30,000 (PhD)

**John P. Laba Memorial Research Award**

This award is provided through a fund established in memory of John P. Laba by family, friends, patients, and colleagues, and may be given annually. The recipient is to be the dentist accepted in the Graduate Program in Oral and Maxillofacial Surgery, and is intended exclusively for the presentation, dissemination and/or publication of research related to Oral and Maxillofacial Surgery. For further information, please contact the Department of Oral and Maxillofacial Surgery.

Eligibility: Available to dentists accepted to the Graduate Program in Oral and Maxillofacial Surgery.

Application Type: Contact the Department, School, or College for more information

**Robert P. Longley Memorial Graduate Scholarships**

Awarded to Nova Scotia residents entering the Master of Science degree program on a full-time basis at the Faculty of Agriculture. The scholarships will be awarded on the basis of academic performance (cumulative GPA from undergraduate degree).

Application Type: Automatic Consideration – No Application Required

**William P. Lydon Scholarship**

This scholarship was established in memory of William P. Lydon, a founder of Lydon Lynch. An insightful natural leader, Bill gently encouraged people to realize their potential. He understood the societal value of architecture and its capacity to uplift the human spirit. Bill himself, it seemed, elevated nearly all who knew him. The award is given to a student who has completed the Bachelor of Environmental Design Studies and is entering the Master of Architecture program. The recipient must demonstrate goodwill, kindness, generosity and respect for others, qualities that defined Bill's character, be actively involved in community services, and have a higher-than-average academic standing.

Application Type: Contact the Department, School, or College for more information

Value: \$1,200

**Dr. R. M. MacDonald Scholarship**

The scholarship pays tribute to Dr. MacDonald's concern to prepare students for the nurse practitioner role. The scholarship is awarded annually to one or more students entering the nurse practitioner stream.

Eligibility: Available to current students in the Master of Nursing program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

**Douglas C. Mackay Scholarship**

The Douglas C. Mackay Entrance Scholarships recognize students who express interest in a career in the financial industry. Students wishing to be considered for this scholarship should clearly indicate interest in a career in the financial industry in their application essay.

Eligibility: Available to entering Corporate Residency MBA students with a GPA of 3.70 or greater, a GMAT score of 600 or greater, and an excellent entrance interview.

Application Type: Contact the Department, School, or College for more information

Value: \$5,000 - \$15,000

**Kim McNutt Scholarship in Planning**

One or more scholarships for students entering full-time studies in the Master of Planning program. Recipients will have demonstrated strong academic qualifications, evidence of financial need and a commitment to community service/capacity building.

Application Type: Contact the Department, School, or College for more information

**Kim McNutt Scholarship in Planning**

To honour the memory of Kim Donald McNutt, for a student who has demonstrated strong academic qualifications, evidence of financial need, and a commitment to community service/capacity building.

Eligibility: Awarded to a student entering full-time studies in the Master of Planning program.

Application Type: Contact the Department, School, or College for more information

**G. G. Meyerhof Graduate Fellowship**

One scholarship is awarded annually, with the possibility of renewal subject to satisfactory performance, to a student accepted in a graduate program in Civil Engineering (field of study: Geotechnical Engineering). Preference is given to Canadian citizens who are graduates in Engineering of recognized Canadian universities.

Application Type: Contact the Faculty for more information

Application Deadline: May 31

**Lottie M. Morrison Scholarship**

The scholarship is awarded to a student entering a Dalhousie University graduate Nursing program who intends to further their studies in the area of Mental Health.

Eligibility: Available to current students in the Master of Nursing or Doctor of Philosophy in Nursing programs at Dalhousie.

Application Type: Contact the Department, School, or College for more information

#### ***Nova Scotia Association of Architects - Ojars Biskaps Award***

The Ojars Biskaps Award honours the memory of Professor Ojars Biskaps, who provided distinguished service to both the academic and professional architecture communities of Nova Scotia. Professor Biskaps was a beloved teacher at the School of Architecture, a significant designer working in collaboration with local architecture practices, and past president of the Nova Scotia Association of Architects. His love of drawing, as a means of documentation, inquiry, storytelling, and humour, characterized his work and life. This \$1,000 award is given by the School of Architecture to a student who has completed the Bachelor of Environmental Design Studies program and is entering the Master of Architecture program, based on a year four portfolio that integrates academic study and design practice, and uses drawing for architectural inquiry and expression.

Application Type: Contact the Department, School, or College for more information

Value: \$1,000

#### ***Nova Scotia Black and First Nations Students Graduate Entrance Scholarships***

Dalhousie University offers two entrance scholarships, awarded annually, to First Nations and Indigenous Black students entering a Dalhousie graduate program for the first-time following graduation from a Dalhousie University undergraduate program. The objective of these scholarships is to increase the representation of Indigenous Black and First Nations communities in the university's wide diversity of graduate programs, and ultimately in the academy and in advanced professional occupations. To be eligible, applicants must have been accepted, by the application deadline, into a graduate program at Dalhousie. This may be at the Master's or Doctoral level, and may include professional, course-based or thesis-based programs. Students must have been accepted with an admission GPA of 3.3 (B+) or higher. Admission GPA's are based on the last two years (six terms) of undergraduate study. Recipients of this scholarship must begin full-time academic study at Dalhousie in the academic year for which it has been awarded. Successful candidates for an initial award and for renewal will be evaluated by a special Scholarship Committee constituted by the Dean of the Faculty of Graduate Studies. The general rules for Dalhousie Graduate Scholarships will be applied except that, in the case of this scholarship, the award must be taken up in the first year of the degree program. These scholarships are valued at \$15,000 each and are renewable for a maximum of one year (three academic terms) for students maintaining good standing in the first year of their program. Renewal is not automatic but must be applied for using the renewal application forms. Eligibility, conditions, and application forms for new and renewal awards are available from the Faculty of Graduate Studies website at [dalgrad.dal.ca/currentstudents/funding/nsbfn](http://dalgrad.dal.ca/currentstudents/funding/nsbfn). The deadline for receipt of new and renewal applications is May 15th.

Eligibility: Available to Black and First Nations students who have completed an undergraduate program at Dalhousie and are staying to pursue graduate studies.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***School of Nursing MN Scholarship***

One or more annual scholarships are awarded to students entering, for part-time study, the Master of Nursing program at Dalhousie University. Applicants must have a minimum grade point average of 3.66 and submit an application letter outlining the contribution they can make to nursing and health care as an outcome of graduate study in nursing.

Eligibility: Available to current part-time students in the Master of Nursing program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

#### ***School of Occupational Therapy Graduate Scholarships***

This scholarship supports full or part-time students who are entering the School's Master of Science program. Selection will be based on the student's scholarly achievement to date and is decided by the Committee of the Whole, School of Occupational Therapy, or a sub-committee of selected faculty. One or more scholarships of approximately \$250 each are offered annually.

Application Type: Contact the Department, School, or College for more information

Value: \$250

#### ***Parkin Family Nurse Practitioner Scholarship***

This renewable scholarship was established by Dr. Robert Parkin in recognition of his appreciation for the Nurse Practitioner role.

Eligibility: Open to Master of Nursing students entering the Nurse Practitioner option. The recipient will have demonstrated a high level of academic achievement (3.70 GPA or higher) and will have shown ability, interest, and commitment to work in underserved communities.

Application Type: Automatic Consideration – No Application Required

#### ***President's Award***

At Dalhousie we actively recruit the brightest minds and deepest thinkers; graduate students who will push the innovation agenda and shape the future. The President's Awards provide a competitive edge at Dalhousie to attract and retain those PhD students who are successful in the competition for national scholarships. This award is targeted to students starting PhD programs who have a full doctoral scholarship from one of the specified agencies. The Specified Agencies are NSERC (PGSD or CGSD), SSHRC (Doctoral or CGSD), CIHR (Doctoral or CGSD), Killam (Doctoral) and/or Vanier. The award will cover tuition but not international differential fees or other student fees. It will be granted for up to the first two years for PhD students. The award will be granted for each term that the student is registered as a full-time student, paying full tuition (i.e., not continuing fees) provided that the student is receiving a full doctoral scholarship from one of the specified agencies and that tuition is not covered by any other award, agency, or government. The Faculty of Graduate Studies will notify eligible students and departments following admission. The Award will be verified and applied to the student's tuition each term for the duration of the award.

Application Type: Automatic Consideration – No Application Required

#### ***George C. Reid and Lucille M. Reid Scholarships***

Awarded to students accepted to a research degree graduate program in the Department of Mechanical Engineering. Preference will be given to new

applicants for MASc degree. The scholarship may be renewed based on satisfactory performance, once for the MASc degree and twice for the PhD degree. Selection will be made by the Engineering Graduate Studies Coordinator, based on recommendations from the Department of Mechanical Engineering. Eligibility: Available to graduate students entering research degree programs in Mechanical Engineering, with preference given to new applicants to the MASc program. Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Eliza Ritchie Doctoral Scholarship for Women***

The Eliza Ritchie Doctoral Scholarship was established to commemorate Women's Centennial Year (1985) and to recognize the contribution to Dalhousie of one of its most important nineteenth-century graduates. After completing her undergraduate studies at Dalhousie in 1887, Eliza Ritchie (1856-1933) became one of the first Canadian women to receive a PhD degree (Cornell University, 1889). She cut short her professional career at Wellesley College to return to Halifax in 1899, where she devoted her energies to feminist and cultural causes, and to Dalhousie, for the rest of her life. She was the first warden of a Dalhousie women's residence (Forrest Hall, 1912-1913), the first woman to serve as a member of the Dalhousie Board of Governors (1919-1925), a founding member of the editorial board of the Dalhousie Review, and the first woman to receive an honorary degree from Dalhousie (LLD 1927). Scholarships are awarded to Canadians and permanent residents only and preference given to candidates from the Atlantic provinces. Among such applicants preference will be given to those in disciplines in which women are underrepresented. The award will have a value of \$24,000 for a 12-month academic period at Dalhousie and is renewable (upon application) for two additional years. One scholarship may be awarded each year. Eligibility: Available to female students in the Doctor of Philosophy program at Dalhousie University. The deadline for receipt of the prescribed application is March 15th. Additional information and application forms (new or renewal) are available on the Faculty of Graduate Studies website (<http://www.dal.ca/faculty/gradstudents/funding/scholarships/eliza.html>) Application Type: Contact the Faculty of Graduate Studies for more information Application Deadline: March 15 Value: \$24,000

#### ***James Robinson Johnston Graduate Scholarship for African Canadians (Master's)***

The James Robinson Johnston Graduate Scholarship is supported by the Faculty of Graduate Studies and the Endowment for the James Robinson Johnston Chair in Black Canadian Studies at Dalhousie as part of the commitment of the Johnston endowment and the university to support the development of Black Canadian scholars in graduate studies and the professions. James R. Johnston was Dalhousie's first Black graduate in the Law Faculty in 1898 and was a major figure in the legal profession and the Black community throughout his short life. Today young African Canadians can be found pursuing studies in the Arts, Sciences, Health Professions and Management as well as the traditional professions of Law, Dentistry and Medicine. This scholarship is intended to provide an opportunity for promising African Canadian students to pursue their work at the graduate level. Successful candidates for an initial award and for renewals will be identified by the James Robinson Johnston Scholarship Committee. The general rules for Dalhousie Graduate Scholarships will be applied except that, in the case of this scholarship, the award must be taken up initially in the first year of the degree program. Scholarships are valued at \$15,000 (Master's level) and \$19,000 (Doctoral level) per year for a 12-month academic year of full-time study. The tuition and fees are not waived and must be paid out of the award. Scholarships may be renewed, subject to satisfactory annual progress review, for one additional year (Master's level) or two additional years (Doctoral level). Scholarship awards cannot extend beyond two years of Master's level study or four years of doctoral level study. Renewal is not automatic but must be applied for using the renewal application forms. Eligibility: Available to Black students in any Master's degree program. Application Type: Contact the Faculty of Graduate Studies for more information

#### ***James Robinson Johnston Graduate Scholarship for African Canadians (PhD)***

The James Robinson Johnston Graduate Scholarship is supported by the Faculty of Graduate Studies and the Endowment for the James Robinson Johnston Chair in Black Canadian Studies at Dalhousie as part of the commitment of the Johnston endowment and the university to support the development of Black Canadian scholars in graduate studies and the professions. James R. Johnston was Dalhousie's first Black graduate in the Law Faculty in 1898 and was a major figure in the legal profession and the Black community throughout his short life. Today young African Canadians can be found pursuing studies in the Arts, Sciences, Health Professions and Management as well as the traditional professions of Law, Dentistry and Medicine. This scholarship is intended to provide an opportunity for promising African Canadian students to pursue their work at the graduate level. Successful candidates for an initial award and for renewals will be identified by the James Robinson Johnston Scholarship Committee. The general rules for Dalhousie Graduate Scholarships will be applied except that, in the case of this scholarship, the award must be taken up initially in the first year of the degree program. Scholarships are valued at \$15,000 (Master's level) and \$19,000 (Doctoral level) per year for a 12-month academic year of full-time study. The tuition and fees are not waived and must be paid out of the award. Scholarships may be renewed, subject to satisfactory annual progress review, for one additional year (Master's level) or two additional years (Doctoral level). Scholarship awards cannot extend beyond two years of Master's level study or four years of doctoral level study. Renewal is not automatic but must be applied for using the renewal application forms. Eligibility: Available to Black students in any Doctor of Philosophy degree program at Dalhousie University. Application Type: Contact the Faculty of Graduate Studies for more information

#### ***George W. Rogers Award***

This award is presented to a student entering the Master of Architecture program. It was established in memory of Donald L. Dunkee, Professor of Architecture at the University of Manitoba for 25 years. The award was named in honour of his student, George W. Rogers, a successful Halifax architect who has been an RAIC member, active in the community, and has received a Governor General's Award for Architecture. Eligibility: The award is given to a Canadian student who has earned a Bachelor of Environmental Design Studies degree and is entering the MArch program. The recipient must be active in student life, extracurricular and community activities; demonstrate potential to contribute to the architecture profession; and display exceptional academic standing. Financial need may be a consideration. Application Type: Automatic Consideration – No Application Required

Value: \$1,000

#### **Rowe Scholarships (MBA)**

Our Rowe Scholarships recognize undergraduate academic excellence and high performance in both the GMAT and interview process.

Eligibility: Available to students entering the Corporate Residence MBA program, with a strong GPA (3.70 or better), GMAT score (600 or greater), and entrance interview.

Application Type: Contact the Department, School, or College for more information

Value: \$2,500 - \$15,000

#### **Scotiabank Ethics in Action Bursary**

To support students with an interest in ethics, Scotiabank is awarding this competitive \$10,000 bursary to one incoming MLIS student. The MLIS Awards & Scholarships Committee will select the successful candidate who will give a public presentation on their perspective on ethics in action as part of SIM's Research Day (April).

Eligibility: Must be an incoming MLIS student.

Application Type: Contact the Department, School, or College for more information

Application Deadline: May 21

#### **Walter Gardner Stanfield Scholarships**

Awarded to students entering the first term of a graduate program in the School of Architecture or the School of Planning based on the quality of work submitted in support of their application for admission, academic excellence, and outstanding preparedness for the program to be undertaken in the faculty. All applications for graduate study received by the first day of the summer term prior to entering the program will be considered automatically.

Application Type: Automatic Consideration – No Application Required

#### **Hilda and Albert Tyler Prize**

Awarded annually to the leading Honours graduate in the Department of English who intends to proceed to a Master's degree in English at Dalhousie University. Emphasis will be placed on the depth of scholarship and meticulous research work. The recipient will have demonstrated sound scholarship and good literary style.

Eligibility: Honours English student from Dalhousie who intends to pursue an MA in English at Dalhousie.

Application Type: Automatic Consideration – No Application Required

#### **H.W. Wilson Foundation Grant**

Since 1957, the H.W. Wilson Foundation has supported U.S. and Canadian library and information science schools accredited by the American Library Association through a scholarship grant program. In the School of Information Management, the H.W. Wilson Grant is competitive. The minimum grade required to be considered for the H.W. Wilson Foundation Grant is A- (3.70 GPA).

Eligibility: Awarded to an incoming full-time Master of Library and Information Studies student on the basis of academic merit.

Application Type: Automatic Consideration – No Application Required

## **In-Course Awards**

### **Introduction**

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## **Faculty of Agriculture**

### **Introduction**

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## **All Faculty of Agriculture Awards**

**Faculty of Agriculture Graduate Entrance Scholarships**

Students who have applied for admission to the graduate program at the Dalhousie Faculty of Agriculture by June 30th each year will be considered.

Evaluation is based on academic performance.

Eligibility: Available to all students entering the Master of Science program in the Faculty of Agriculture at Dalhousie.

Application Type: Automatic Consideration – No Application Required

**Faculty of Agriculture International Graduate Entrance Scholarships**

International students who have applied for admission to the graduate program at the Dalhousie Faculty of Agriculture by June 30th each year will be considered for these awards. Evaluation is based on academic performance.

Eligibility: Available to full-time international students entering the Master of Science program in the Faculty of Agriculture at Dalhousie.

Application Type: Automatic Consideration – No Application Required

**Stuart and Ruth Allaby Graduate Studies Scholarship**

Awarded to a Master of Science student concentrating on animal research.

Application Type: Faculty of Agriculture In-Course Award Application

**Atlantic Farm Mechanization Show Graduate Scholarship in Engineering**

Eligibility: Open to MSc Agriculture students from Atlantic Canada conducting research in an engineering discipline.

Application Type: Faculty of Agriculture In-Course Award Application

**Edward Brown Memorial Graduate Scholarship**

In memory of Edward Brown, Class of 1954, a scholarship is awarded annually to an outstanding graduate of an undergraduate degree from the Dalhousie Faculty of Agriculture (formerly NSAC), studying in the second year of the Master of Science in the same faculty.

Eligibility: Available to second year Master of Science students at the Faculty of Agriculture with preference given to residents of Nova Scotia, followed by residents of one of the Atlantic provinces (NB, NS, NL, PEI). See award description for specific eligibility requirements.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [moneymatters.dal.ca](http://moneymatters.dal.ca) for application deadline

**Canard Graduate Conservation Fund Scholarship**

Awarded to a graduate student conducting research work on environmental issues. Selection criteria include: research aptitude and experience relevant of the applicant's research to conservation issues and sound academic performance.

Eligibility: Available to all full-time graduate students in the Faculty of Agriculture at Dalhousie, with preference given to students in the second year of study in the MSc program. Applicants must be conducting research relating to environmental issues.

Application Type: Faculty of Agriculture In-Course Award Application

**Class of '58 Scholarship**

Eligibility: Awarded to a MSc Agriculture student based on strong academic performance and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

**Class of 1956 Graduate Student Scholarship**

Awarded to a graduate student conducting a research project in one of the following areas of study: agricultural economics and policy, social sciences, engineering, and environmental sciences. The scholarship is intended to stimulate research on rural water supply and rural watershed management in Atlantic Canada.

Application Type: Contact the Faculty of Graduate Studies for more information

**Dalhousie Agricultural Students' Association Awards**

Dalhousie Agricultural Students' Association (DASA) is the student association for all students at the Dalhousie Agricultural Campus. DASA is the official voice of the student body and provides leadership and vision for the students of the Agricultural Campus. DASA promotes student engagement and leadership through various campus activities including Orientation, Shinerama, College Royal and Winter Carnival. DASA also promotes student engagement within the surrounding communities of Truro and Bible Hill. DASA works closely with Student Services and Administration to collectively provide a welcoming community dedicated to higher learning and service to the community.

Eligibility: Awarded to students enrolled in the Faculty of Agriculture who have demonstrated, in the current academic year, exceptional school spirit and involvement in any or all of the following: DASA sponsored events, volunteering, campus community leadership.

Application Type: Automatic Consideration – No Application Required

Value: 2 @ \$300

**The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English**

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose

short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Faculty of Agriculture Graduate Scholarship***

Eligibility: Awarded to a MSc Agriculture or PhD student whose primary supervisor is in the Faculty of Agriculture. The award is based on strong academic performance and demonstrated financial need.

Application Type: Faculty of Agriculture In-Course Award Application

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***Graduate Research Training Initiative (GRTI) Scholarships***

This program provides scholarships to high caliber students who are engaged in a research-based Master of Science program and who are conducting research that will benefit Nova Scotia’s agriculture and agri-food industry. This initiative is intended to ensure a reliable supply of highly qualified personnel to meet the future needs of Nova Scotia’s agri-food industry.

Eligibility: Available to all students entering the Master of Science program in the Faculty of Agriculture at Dalhousie. Applicants must be conducting research relating to Nova Scotia’s Agriculture and Agri-Food industry.

Application Type: Contact the Faculty of Graduate Studies for more information

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***Gordon B. Kinsman Memorial Graduate Scholarships***

Awarded to graduate students registered in the MSc Agriculture program who are conducting research work related to the blueberry industry.

Application Type: Faculty of Agriculture In-Course Award Application

***Dr. Herbert F. MacRae Memorial Dalhousie Faculty of Agriculture/ Macdonald College Exchange Award***

This award is designed to support student exchange between the Faculty of Agriculture and Macdonald College of McGill University.

Eligibility: Available to all graduate students in the Faculty of Agriculture participating in an exchange program at McGill University.

Application Type: Contact awards@dal.ca for more information

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Allan A. Saunders Memorial Graduate Scholarship***

Awarded annually to a graduate student conducting research relating to the dairy industry. Applicants who have completed their undergraduate degree at the Faculty of Agriculture who wish to pursue their Masters at another post-secondary institution will be considered. Selection criteria include academic performance, dairy farm background and/or demonstrated interest in the dairy industry and financial need.

Application Type: Faculty of Agriculture In-Course Award Application



**Dr. Chesley E. Smith Memorial Graduate Scholarship**

Awarded annually, with preference to students whose course and project work reflect an interest in plant science or agronomy. Selection criteria include academic performance and financial need.

Eligibility: Available to all graduate students in the Faculty of Agriculture at Dalhousie, with preference given to those with a demonstrated interest in Plant Science or Agronomy.

Application Type: Faculty of Agriculture In-Course Award Application

**Syngenta Graduate Student Scholarship**

Awarded annually to a Master of Science student conducting research pertaining to sustainable agriculture. For the purposes of this award, 'sustainable agriculture' will be described as a balance between social, environmental, and economic priorities. Project areas eligible for support will focus on environmental quality and resource management, land management, integrated pest management, introduction of new technologies, economic viability, and rural community sustainability. Selection criteria include academic performance and research goals consistent with sustainable agriculture.

Eligibility: Available to current Master of Science students at the Faculty of Agriculture.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [moneymatters.dal.ca](http://moneymatters.dal.ca) for application deadline

**Zhuhui Ye Memorial Award**

This fund was established by classmates of Zhuhui Ye (Kevin) to honour his memory. Kevin attended the former Nova Scotia Agricultural College as part of the FAFU 2+2 program, earning his BSc(Agr) in Aquaculture in 2012. Kevin continued his studies with the Dalhousie MSc. program. On September 8, 2012, Kevin lost his life in a drowning accident at Dollar Lake Provincial Park. Kevin is well remembered as an intelligent, popular, and outgoing man whose generosity touched the lives of many friends. The intent of the Zhuhui Ye Memorial Award is to further the understanding of culture and relationship between Chinese and Canadian students by supporting the FAFU/DAC 2+2 program.

Eligibility: Award to a Chinese student in the FAFU 2+2 program or another student demonstrating a commitment to and involvement with the FAFU 2+2 program at the Faculty of Agriculture, in addition to academic performance and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [dal.ca/scholarships](http://dal.ca/scholarships) for application deadlines

Value: \$500

## Business and Social Sciences

**Faculty of Agriculture Graduate Entrance Scholarships**

Students who have applied for admission to the graduate program at the Dalhousie Faculty of Agriculture by June 30th each year will be considered.

Evaluation is based on academic performance.

Eligibility: Available to all students entering the Master of Science program in the Faculty of Agriculture at Dalhousie.

Application Type: Automatic Consideration – No Application Required

**Faculty of Agriculture International Graduate Entrance Scholarships**

International students who have applied for admission to the graduate program at the Dalhousie Faculty of Agriculture by June 30th each year will be considered for these awards. Evaluation is based on academic performance.

Eligibility: Available to full-time international students entering the Master of Science program in the Faculty of Agriculture at Dalhousie.

Application Type: Automatic Consideration – No Application Required

**Stuart and Ruth Allaby Graduate Studies Scholarship**

Awarded to a Master of Science student concentrating on animal research.

Application Type: Faculty of Agriculture In-Course Award Application

**Atlantic Farm Mechanization Show Graduate Scholarship in Engineering**

Eligibility: Open to MSc Agriculture students from Atlantic Canada conducting research in an engineering discipline.

Application Type: Faculty of Agriculture In-Course Award Application

**Edward Brown Memorial Graduate Scholarship**

In memory of Edward Brown, Class of 1954, a scholarship is awarded annually to an outstanding graduate of an undergraduate degree from the Dalhousie Faculty of Agriculture (formerly NSAC), studying in the second year of the Master of Science in the same faculty.

Eligibility: Available to second year Master of Science students at the Faculty of Agriculture with preference given to residents of Nova Scotia, followed by residents of one of the Atlantic provinces (NB, NS, NL, PEI). See award description for specific eligibility requirements.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [moneymatters.dal.ca](http://moneymatters.dal.ca) for application deadline

**Canard Graduate Conservation Fund Scholarship**

Awarded to a graduate student conducting research work on environmental issues. Selection criteria include: research aptitude and experience relevant of

the applicant's research to conservation issues and sound academic performance.

Eligibility: Available to all full-time graduate students in the Faculty of Agriculture at Dalhousie, with preference given to students in the second year of study in the MSc program. Applicants must be conducting research relating to environmental issues.

Application Type: Faculty of Agriculture In-Course Award Application

#### ***Class of '58 Scholarship***

Eligibility: Awarded to a MSc Agriculture student based on strong academic performance and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

#### ***Class of 1956 Graduate Student Scholarship***

Awarded to a graduate student conducting a research project in one of the following areas of study: agricultural economics and policy, social sciences, engineering, and environmental sciences. The scholarship is intended to stimulate research on rural water supply and rural watershed management in Atlantic Canada.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Dalhousie Agricultural Students' Association Awards***

Dalhousie Agricultural Students' Association (DASA) is the student association for all students at the Dalhousie Agricultural Campus. DASA is the official voice of the student body and provides leadership and vision for the students of the Agricultural Campus. DASA promotes student engagement and leadership through various campus activities including Orientation, Shinerama, College Royal and Winter Carnival. DASA also promotes student engagement within the surrounding communities of Truro and Bible Hill. DASA works closely with Student Services and Administration to collectively provide a welcoming community dedicated to higher learning and service to the community.

Eligibility: Awarded to students enrolled in the Faculty of Agriculture who have demonstrated, in the current academic year, exceptional school spirit and involvement in any or all of the following: DASA sponsored events, volunteering, campus community leadership.

Application Type: Automatic Consideration – No Application Required

Value: 2 @ \$300

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Faculty of Agriculture Graduate Scholarship***

Eligibility: Awarded to a MSc Agriculture or PhD student whose primary supervisor is in the Faculty of Agriculture. The award is based on strong academic performance and demonstrated financial need.

Application Type: Faculty of Agriculture In-Course Award Application

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***Graduate Research Training Initiative (GRTI) Scholarships***

This program provides scholarships to high caliber students who are engaged in a research-based Master of Science program and who are conducting research that will benefit Nova Scotia's agriculture and agri-food industry. This initiative is intended to ensure a reliable supply of highly qualified personnel to meet the future needs of Nova Scotia's agri-food industry.

Eligibility: Available to all students entering the Master of Science program in the Faculty of Agriculture at Dalhousie. Applicants must be conducting research relating to Nova Scotia's Agriculture and Agri-Food industry.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Gordon B. Kinsman Memorial Graduate Scholarships***

Awarded to graduate students registered in the MSc Agriculture program who are conducting research work related to the blueberry industry.

Application Type: Faculty of Agriculture In-Course Award Application

#### ***Dr. Herbert F. MacRae Memorial Dalhousie Faculty of Agriculture/ Macdonald College Exchange Award***

This award is designed to support student exchange between the Faculty of Agriculture and Macdonald College of McGill University.

Eligibility: Available to all graduate students in the Faculty of Agriculture participating in an exchange program at McGill University.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Allan A. Saunders Memorial Graduate Scholarship***

Awarded annually to a graduate student conducting research relating to the dairy industry. Applicants who have completed their undergraduate degree at the Faculty of Agriculture who wish to pursue their Masters at another post-secondary institution will be considered. Selection criteria include academic performance, dairy farm background and/or demonstrated interest in the dairy industry and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

#### ***Dr. Chesley E. Smith Memorial Graduate Scholarship***

Awarded annually, with preference to students whose course and project work reflect an interest in plant science or agronomy. Selection criteria include academic performance and financial need.

Eligibility: Available to all graduate students in the Faculty of Agriculture at Dalhousie, with preference given to those with a demonstrated interest in Plant Science or Agronomy.

Application Type: Faculty of Agriculture In-Course Award Application

#### ***Syngenta Graduate Student Scholarship***

Awarded annually to a Master of Science student conducting research pertaining to sustainable agriculture. For the purposes of this award, 'sustainable agriculture' will be described as a balance between social, environmental, and economic priorities. Project areas eligible for support will focus on environmental quality and resource management, land management, integrated pest management, introduction of new technologies, economic viability, and rural community sustainability. Selection criteria include academic performance and research goals consistent with sustainable agriculture.

Eligibility: Available to current Master of Science students at the Faculty of Agriculture.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [moneymatters.dal.ca](http://moneymatters.dal.ca) for application deadline

#### ***Zhuhui Ye Memorial Award***

This fund was established by classmates of Zhuhui Ye (Kevin) to honour his memory. Kevin attended the former Nova Scotia Agricultural College as part of the FAFU 2+2 program, earning his BSc(Agr) in Aquaculture in 2012. Kevin continued his studies with the Dalhousie MSc. program. On September 8, 2012, Kevin lost his life in a drowning accident at Dollar Lake Provincial Park. Kevin is well remembered as an intelligent, popular, and outgoing man whose generosity touched the lives of many friends. The intent of the Zhuhui Ye Memorial Award is to further the understanding of culture and relationship between Chinese and Canadian students by supporting the FAFU/DAC 2+2 program.

Eligibility: Award to a Chinese student in the FAFU 2+2 program or another student demonstrating a commitment to and involvement with the FAFU 2+2 program at the Faculty of Agriculture, in addition to academic performance and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [dal.ca/scholarships](http://dal.ca/scholarships) for application deadlines

Value: \$500

## **Engineering**

#### ***Dalhousie Agricultural Students' Association Awards***

Dalhousie Agricultural Students' Association (DASA) is the student association for all students at the Dalhousie Agricultural Campus. DASA is the official voice of the student body and provides leadership and vision for the students of the Agricultural Campus. DASA promotes student engagement and

leadership through various campus activities including Orientation, Shinerama, College Royal and Winter Carnival. DASA also promotes student engagement within the surrounding communities of Truro and Bible Hill. DASA works closely with Student Services and Administration to collectively provide a welcoming community dedicated to higher learning and service to the community.

Eligibility: Awarded to students enrolled in the Faculty of Agriculture who have demonstrated, in the current academic year, exceptional school spirit and involvement in any or all of the following: DASA sponsored events, volunteering, campus community leadership.

Application Type: Automatic Consideration – No Application Required

Value: 2 @ \$300

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***Zhuhui Ye Memorial Award***

This fund was established by classmates of Zhuhui Ye (Kevin) to honour his memory. Kevin attended the former Nova Scotia Agricultural College as part of the FAFU 2+2 program, earning his BSc(Agr) in Aquaculture in 2012. Kevin continued his studies with the Dalhousie MSc. program. On September 8, 2012, Kevin lost his life in a drowning accident at Dollar Lake Provincial Park. Kevin is well remembered as an intelligent, popular, and outgoing man whose generosity touched the lives of many friends. The intent of the Zhuhui Ye Memorial Award is to further the understanding of culture and relationship between Chinese and Canadian students by supporting the FAFU/DAC 2+2 program.

Eligibility: Award to a Chinese student in the FAFU 2+2 program or another student demonstrating a commitment to and involvement with the FAFU 2+2 program at the Faculty of Agriculture, in addition to academic performance and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [dal.ca/scholarships](http://dal.ca/scholarships) for application deadlines

Value: \$500

## **Environmental Sciences**

#### ***Faculty of Agriculture Graduate Entrance Scholarships***

Students who have applied for admission to the graduate program at the Dalhousie Faculty of Agriculture by June 30th each year will be considered.

Evaluation is based on academic performance.

Eligibility: Available to all students entering the Master of Science program in the Faculty of Agriculture at Dalhousie.

Application Type: Automatic Consideration – No Application Required

#### ***Faculty of Agriculture International Graduate Entrance Scholarships***

International students who have applied for admission to the graduate program at the Dalhousie Faculty of Agriculture by June 30th each year will be considered for these awards. Evaluation is based on academic performance.

Eligibility: Available to full-time international students entering the Master of Science program in the Faculty of Agriculture at Dalhousie.

Application Type: Automatic Consideration – No Application Required

#### ***Stuart and Ruth Allaby Graduate Studies Scholarship***

Awarded to a Master of Science student concentrating on animal research.

Application Type: Faculty of Agriculture In-Course Award Application

#### ***Atlantic Farm Mechanization Show Graduate Scholarship in Engineering***

Eligibility: Open to MSc Agriculture students from Atlantic Canada conducting research in an engineering discipline.

Application Type: Faculty of Agriculture In-Course Award Application

#### ***Edward Brown Memorial Graduate Scholarship***

In memory of Edward Brown, Class of 1954, a scholarship is awarded annually to an outstanding graduate of an undergraduate degree from the Dalhousie Faculty of Agriculture (formerly NSAC), studying in the second year of the Master of Science in the same faculty.

Eligibility: Available to second year Master of Science students at the Faculty of Agriculture with preference given to residents of Nova Scotia, followed by residents of one of the Atlantic provinces (NB, NS, NL, PEI). See award description for specific eligibility requirements.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [moneymatters.dal.ca](http://moneymatters.dal.ca) for application deadline

**Canard Graduate Conservation Fund Scholarship**

Awarded to a graduate student conducting research work on environmental issues. Selection criteria include: research aptitude and experience relevant of the applicant's research to conservation issues and sound academic performance.

Eligibility: Available to all full-time graduate students in the Faculty of Agriculture at Dalhousie, with preference given to students in the second year of study in the MSc program. Applicants must be conducting research relating to environmental issues.

Application Type: Faculty of Agriculture In-Course Award Application

**Class of '58 Scholarship**

Eligibility: Awarded to a MSc Agriculture student based on strong academic performance and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

**Class of 1956 Graduate Student Scholarship**

Awarded to a graduate student conducting a research project in one of the following areas of study: agricultural economics and policy, social sciences, engineering, and environmental sciences. The scholarship is intended to stimulate research on rural water supply and rural watershed management in Atlantic Canada.

Application Type: Contact the Faculty of Graduate Studies for more information

**Dalhousie Agricultural Students' Association Awards**

Dalhousie Agricultural Students' Association (DASA) is the student association for all students at the Dalhousie Agricultural Campus. DASA is the official voice of the student body and provides leadership and vision for the students of the Agricultural Campus. DASA promotes student engagement and leadership through various campus activities including Orientation, Shinerama, College Royal and Winter Carnival. DASA also promotes student engagement within the surrounding communities of Truro and Bible Hill. DASA works closely with Student Services and Administration to collectively provide a welcoming community dedicated to higher learning and service to the community.

Eligibility: Awarded to students enrolled in the Faculty of Agriculture who have demonstrated, in the current academic year, exceptional school spirit and involvement in any or all of the following: DASA sponsored events, volunteering, campus community leadership.

Application Type: Automatic Consideration – No Application Required

Value: 2 @ \$300

**Faculty of Agriculture Graduate Scholarship**

Eligibility: Awarded to a MSc Agriculture or PhD student whose primary supervisor is in the Faculty of Agriculture. The award is based on strong academic performance and demonstrated financial need.

Application Type: Faculty of Agriculture In-Course Award Application

**The Irving and Jeanne Glovin Award**

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

**Graduate Research Training Initiative (GRTI) Scholarships**

This program provides scholarships to high caliber students who are engaged in a research-based Master of Science program and who are conducting research that will benefit Nova Scotia's agriculture and agri-food industry. This initiative is intended to ensure a reliable supply of highly qualified personnel to meet the future needs of Nova Scotia's agri-food industry.

Eligibility: Available to all students entering the Master of Science program in the Faculty of Agriculture at Dalhousie. Applicants must be conducting research relating to Nova Scotia's Agriculture and Agri-Food industry.

Application Type: Contact the Faculty of Graduate Studies for more information

**Gordon B. Kinsman Memorial Graduate Scholarships**

Awarded to graduate students registered in the MSc Agriculture program who are conducting research work related to the blueberry industry.

Application Type: Faculty of Agriculture In-Course Award Application

**Dr. Herbert F. MacRae Memorial Dalhousie Faculty of Agriculture/ Macdonald College Exchange Award**

This award is designed to support student exchange between the Faculty of Agriculture and Macdonald College of McGill University.

Eligibility: Available to all graduate students in the Faculty of Agriculture participating in an exchange program at McGill University.

Application Type: Contact awards@dal.ca for more information

***The Allan A. Saunders Memorial Graduate Scholarship***

Awarded annually to a graduate student conducting research relating to the dairy industry. Applicants who have completed their undergraduate degree at the Faculty of Agriculture who wish to pursue their Masters at another post-secondary institution will be considered. Selection criteria include academic performance, dairy farm background and/or demonstrated interest in the dairy industry and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

***Dr. Chesley E. Smith Memorial Graduate Scholarship***

Awarded annually, with preference to students whose course and project work reflect an interest in plant science or agronomy. Selection criteria include academic performance and financial need.

Eligibility: Available to all graduate students in the Faculty of Agriculture at Dalhousie, with preference given to those with a demonstrated interest in Plant Science or Agronomy.

Application Type: Faculty of Agriculture In-Course Award Application

***Syngenta Graduate Student Scholarship***

Awarded annually to a Master of Science student conducting research pertaining to sustainable agriculture. For the purposes of this award, 'sustainable agriculture' will be described as a balance between social, environmental, and economic priorities. Project areas eligible for support will focus on environmental quality and resource management, land management, integrated pest management, introduction of new technologies, economic viability, and rural community sustainability. Selection criteria include academic performance and research goals consistent with sustainable agriculture.

Eligibility: Available to current Master of Science students at the Faculty of Agriculture.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [moneymatters.dal.ca](http://moneymatters.dal.ca) for application deadline

***Zhuhui Ye Memorial Award***

This fund was established by classmates of Zhuhui Ye (Kevin) to honour his memory. Kevin attended the former Nova Scotia Agricultural College as part of the FAFU 2+2 program, earning his BSc(Agr) in Aquaculture in 2012. Kevin continued his studies with the Dalhousie MSc. program. On September 8, 2012, Kevin lost his life in a drowning accident at Dollar Lake Provincial Park. Kevin is well remembered as an intelligent, popular, and outgoing man whose generosity touched the lives of many friends. The intent of the Zhuhui Ye Memorial Award is to further the understanding of culture and relationship between Chinese and Canadian students by supporting the FAFU/DAC 2+2 program.

Eligibility: Award to a Chinese student in the FAFU 2+2 program or another student demonstrating a commitment to and involvement with the FAFU 2+2 program at the Faculty of Agriculture, in addition to academic performance and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [dal.ca/scholarships](http://dal.ca/scholarships) for application deadlines

Value: \$500

## Plant and Animal Science

***Faculty of Agriculture Graduate Entrance Scholarships***

Students who have applied for admission to the graduate program at the Dalhousie Faculty of Agriculture by June 30th each year will be considered.

Evaluation is based on academic performance.

Eligibility: Available to all students entering the Master of Science program in the Faculty of Agriculture at Dalhousie.

Application Type: Automatic Consideration – No Application Required

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International students who have applied for admission to the graduate program at the Dalhousie Faculty of Agriculture by June 30th each year will be considered for these awards. Evaluation is based on academic performance.

Eligibility: Available to full-time international students entering the Master of Science program in the Faculty of Agriculture at Dalhousie.

Application Type: Automatic Consideration – No Application Required

***Stuart and Ruth Allaby Graduate Studies Scholarship***

Awarded to a Master of Science student concentrating on animal research.

Application Type: Faculty of Agriculture In-Course Award Application

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Eligibility: Open to MSc Agriculture students from Atlantic Canada conducting research in an engineering discipline.

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In memory of Edward Brown, Class of 1954, a scholarship is awarded annually to an outstanding graduate of an undergraduate degree from the Dalhousie Faculty of Agriculture (formerly NSAC), studying in the second year of the Master of Science in the same faculty.

Eligibility: Available to second year Master of Science students at the Faculty of Agriculture with preference given to residents of Nova Scotia, followed by

residents of one of the Atlantic provinces (NB, NS, NL, PEI). See award description for specific eligibility requirements.

Application Type: Faculty of Agriculture In-Course Award Application

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Awarded to a graduate student conducting research work on environmental issues. Selection criteria include: research aptitude and experience relevant of the applicant's research to conservation issues and sound academic performance.

Eligibility: Available to all full-time graduate students in the Faculty of Agriculture at Dalhousie, with preference given to students in the second year of study in the MSc program. Applicants must be conducting research relating to environmental issues.

Application Type: Faculty of Agriculture In-Course Award Application

#### ***Class of '58 Scholarship***

Eligibility: Awarded to a MSc Agriculture student based on strong academic performance and financial need.

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Value: 2 @ \$300

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Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***Graduate Research Training Initiative (GRTI) Scholarships***

This program provides scholarships to high caliber students who are engaged in a research-based Master of Science program and who are conducting research that will benefit Nova Scotia's agriculture and agri-food industry. This initiative is intended to ensure a reliable supply of highly qualified personnel to meet the future needs of Nova Scotia's agri-food industry.

Eligibility: Available to all students entering the Master of Science program in the Faculty of Agriculture at Dalhousie. Applicants must be conducting research relating to Nova Scotia's Agriculture and Agri-Food industry.

Application Type: Contact the Faculty of Graduate Studies for more information

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The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

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Application Type: Contact the Faculty of Graduate Studies for more information

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Application Type: Contact awards@dal.ca for more information

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Allan A. Saunders Memorial Graduate Scholarship***

Awarded annually to a graduate student conducting research relating to the dairy industry. Applicants who have completed their undergraduate degree at the Faculty of Agriculture who wish to pursue their Masters at another post-secondary institution will be considered. Selection criteria include academic performance, dairy farm background and/or demonstrated interest in the dairy industry and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

***Dr. Chesley E. Smith Memorial Graduate Scholarship***

Awarded annually, with preference to students whose course and project work reflect an interest in plant science or agronomy. Selection criteria include academic performance and financial need.

Eligibility: Available to all graduate students in the Faculty of Agriculture at Dalhousie, with preference given to those with a demonstrated interest in Plant Science or Agronomy.

Application Type: Faculty of Agriculture In-Course Award Application

***Syngenta Graduate Student Scholarship***

Awarded annually to a Master of Science student conducting research pertaining to sustainable agriculture. For the purposes of this award, 'sustainable agriculture' will be described as a balance between social, environmental, and economic priorities. Project areas eligible for support will focus on environmental quality and resource management, land management, integrated pest management, introduction of new technologies, economic viability, and rural community sustainability. Selection criteria include academic performance and research goals consistent with sustainable agriculture.

Eligibility: Available to current Master of Science students at the Faculty of Agriculture.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [moneymatters.dal.ca](http://moneymatters.dal.ca) for application deadline

***Zhuhui Ye Memorial Award***

This fund was established by classmates of Zhuhui Ye (Kevin) to honour his memory. Kevin attended the former Nova Scotia Agricultural College as part of the FAFU 2+2 program, earning his BSc(Agr) in Aquaculture in 2012. Kevin continued his studies with the Dalhousie MSc. program. On September 8, 2012, Kevin lost his life in a drowning accident at Dollar Lake Provincial Park. Kevin is well remembered as an intelligent, popular, and outgoing man whose generosity touched the lives of many friends. The intent of the Zhuhui Ye Memorial Award is to further the understanding of culture and relationship between Chinese and Canadian students by supporting the FAFU/DAC 2+2 program.

Eligibility: Award to a Chinese student in the FAFU 2+2 program or another student demonstrating a commitment to and involvement with the FAFU 2+2 program at the Faculty of Agriculture, in addition to academic performance and financial need.

Application Type: Faculty of Agriculture In-Course Award Application

Application Deadline to Apply: Check [dal.ca/scholarships](http://dal.ca/scholarships) for application deadlines



# Faculty of Architecture and Planning

## Introduction

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## All Faculty of Architecture and Planning Awards

### ***Kirsty Bruce Bursary***

This \$1,000 bursary was established in memory of Kirsty Lee St. Clair Bruce (MArch 2007).

Eligibility: Students entering the final thesis term of the Master of Architecture program, with preference given to female students who are Canadian citizens or permanent residents.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: First day of the winter term

Value: \$1000

### ***The Henry Adams Medal***

Awarded by the American Institute of Architects to a high-ranking graduating student from the MArch program who has achieved general excellence throughout the program.

Application Type: Automatic Consideration – No Application Required

### ***Adjeleian Award in the Aesthetics of Structures***

Awarded to a graduating student in either the Master of Architecture program or the Civil Engineering degree program who demonstrates in a project both aesthetic principles in buildings or bridges and unified roots of Architecture and Structural Engineering. The award alternates between Architecture (in odd years) and Engineering (in even years). Application not required (for Architecture).

Eligibility: Available to a Master of Architecture or a Bachelor of Engineering (Civil Engineering) student.

Application Type: Contact the Faculty for more information

### ***The Alpha Rho Chi Medal***

Alpha Rho Chi, National Social-Professional Fraternity of Architecture, awards the Alpha Rho Chi Medal to a graduating senior of the School of Architecture who has shown an ability for leadership, performed willing service for the school, and gives promise of real professional merit through attitude and personality.

Application Type: Automatic Consideration – No Application Required

### ***The Alumni Memorial Award***

This award, which was initiated in 1984 in the memory of Mr. Michael Kravosky (BArch 1983), is awarded each year to a graduating student elected by the graduating class for outstanding service to the school in student activities and affairs. The award is made from the proceeds of the Architecture Alumni Memorial Fund and is subject to annual review.

Application Type: Automatic Consideration – No Application Required

### ***School of Architecture Thesis Prize***

The School of Architecture awards a prize to one or more students who have completed an outstanding design thesis in the Master of Architecture program.

Application Type: Automatic Consideration – No Application Required

### ***Architecture and Planning Bursaries***

Proceeds from the former TUNS Board of Governors Fund are used at the Dean's discretion. They provide up to five \$1,000 bursaries to assist full-time students entering the winter term of the Bachelor of Environmental Design Studies or Master of Architecture program in the School of Architecture or the Bachelor of Community Design or Master of Planning program in the School of Planning.

Eligibility: Applicants must be making satisfactory academic progress and must demonstrate financial need by submitting a bursary application. Selections are made by the Scholarship Committees of the School of Architecture and the School of Planning.

Application Type: Contact the Department, School, or College for more information

Value: \$1,000

***Brant Wishart Memorial Scholarship***

Brant Wishart Memorial Scholarship is given to a student of Planning who has demonstrated academic excellence and leadership. Value \$1,000, awarded annually in April.

Eligibility: Available to current students in the Master of Planning and Master of Planning Studies programs at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Value: \$1,000

***H. Allen Brooks Traveling Fellowship***

This award is made periodically to an exceptionally promising student who is graduating from (or has recently graduated from) a professional architecture or planning degree program in the Faculty of Architecture and Planning. It enables the recipient to travel and contemplate while observing, sketching, reading, or writing. It provides time to think and mature, while acquiring knowledge that will be useful for their future work and contribution to the profession and society.

Eligibility: Available to graduate students completing their studies in the Faculty of Architecture and Planning at Dalhousie University. See award description for specific eligibility requirements.

Application Type: Contact the Department, School, or College for more information

***Canadian Institute of Planners Student Award for Academic Excellence (Graduate)***

Awarded to a full-time student member of the Canadian Institute of Planners who has achieved the highest academic standing over the length of the MPlan program.

Application Type: Automatic Consideration – No Application Required

***Canadian Institute of Planners Student Scholarships***

Awarded to a student member in good standing with the CIP and enrolled full-time in a recognized planning program. Applications forms are available from the School of Planning and must be received by the CIP national office by the date indicated on the application. Applications are judged on the basis of a student's potential contribution to the planning profession (in theory or in practice) and their potential service to a community or community group.

Eligibility: Available to current students in the Master of Planning and Master of Planning Studies programs at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

***Canadian Institute of Steel Construction Architecture Scholarship***

This scholarship, donated by the Canadian Institute of Steel Construction, is awarded to a Master of Architecture student who has completed the first MArch thesis term. It is intended to support thesis design work that uses structural steel in a critical way. Following the completion of the thesis, the student submits a report to CISC for publication.

Eligibility: The scholarship is open to students in the final year of the Master of Architecture program. Applicants must submit a proposal. Selection is made by the School of Architecture.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of the winter term

Value: \$3,000

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Design and Construction Institute of Engineering and Architecture Scholarship***

The Design and Construction Institute (DCI) is a volunteer organization consisting of over 75 industry leaders whose common goal is to promote, foster and advocate for the design and construction industry in Nova Scotia. This fund was established to recognize and support engineering students who are enrolled in an undergraduate program and architecture students who are enrolled in a graduate programs.

Eligibility: Awarded annually to students who show an aptitude for, or are interested in, the design and construction industries in Nova Scotia. Recipients will be selected based on academic achievement and recommendations from professors. Engineering applicants will be in the third or fourth year and will

submit a letter to DCI demonstrating their commitment to pursuing a career in the design and/or construction industry. The Architecture recipient will be in the first year of the Master of Architecture program and is not required to submit an application.

Application Type: Faculty of Engineering: Undergraduate In-Course Scholarship Application

Application Deadline to Apply: September 30 (Engineering); no application required for Architecture

Value: \$500 to Engineering, \$500 to Architecture

#### ***Wallace and Marie Dykeman Prize in Rural Planning***

A planning student in the final year of study who engages in innovative research on rural planning, who conducts a special project, who develops an inspiring thesis or who shows outstanding service to others.

Application Type: Contact the Department, School, or College for more information

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***Exxon Mobil Canada Ltd. Scholarship***

Awarded to a student entering a graduate program in the School of Planning with academic excellence and an interest in studying the impacts and design-related issues of energy developments.

Application Type: Contact the Department, School, or College for more information

Value: \$7,000

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Jonathan Hart Memorial Fund***

This fund was established in memory of Jonathan Hart (MArch 1996) by Mr. Justice Gordon Hart and Mrs. Catherine Hart, following Jonathan's request to support architecture in the community. Proceeds from this fund are used periodically to bring architectural work to the public, and to encourage young architects and businesses to work together on projects for the betterment of the community.

Eligibility: Available to Master of Architecture students. Selection is made by the School of Architecture.

Application Type: Contact the Department, School, or College for more information

#### ***Kent C. Hurley Architecture Fund***

Funds from the estate of Kent C. Hurley, a former professor at the School of Architecture, will be used periodically to support the school's academic mission. This may involve scholarships, outreach, teaching, and research.

Eligibility: Funds will be allocated by the School of Architecture. This may include scholarships for incoming or current undergraduate and graduate architecture students.

Application Type: Contact the Department, School, or College for more information

***George Lawen / Dixel Developments Scholarship***

Dixel Developments is an award-winning mixed-use property developer focused primarily on residential apartments and the regeneration of existing heritage properties located in the Halifax business district. The George Lawen/Dixel Developments Scholarship was created in 2010 by Louis Lawen to recognize and support the crucial role of planning to the future development of Halifax and the surrounding area by supporting a student who intends to pursue a career in the Maritimes. The scholarship is named in honour of Louis' father, George Lawen. The scholarship will provide a \$5,000 award to a student entering the final year of the Master of Planning program, with second preference to a student entering the final year of the Master of Architecture program. The student will have demonstrated active involvement in community service and will have a high academic standing and an interest in urban design or urban planning.

Application Type: Contact the Department, School, or College for more information

Value: \$5,000

***Dorothy Leslie Prize***

This prize, named after the former secretary of the School of Planning, is awarded to a student finishing the first year of the Masters program who has made a significant contribution to the life of the school.

Application Type: Automatic Consideration – No Application Required

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Newfoundland and Labrador Association of Architects William J. Ryan Memorial Scholarship***

The Newfoundland and Labrador Association of Architects established this award to an architecture student entering Year 4 of the BEDS program who was a resident of Newfoundland and Labrador prior to beginning post-secondary studies. If no Year 4 students are eligible, the scholarship may be awarded to a student entering Year 5 of the MArch program. Selection will be based on: (a) design ability in assigned projects; (b) practicality of design; (c) aptitude for a subject(s) other than design of architecture and the built environment; (d) development of professional ability; and (e) grades in courses other than design.

Application Type: Automatic Consideration – No Application Required

Value: \$2,000

***Nine Yards Studio Scholarship***

Nine Yards Studio Scholarship, worth \$1,000, supports a student who is doing community-related design work in a Master of Architecture thesis. It is donated by Nine Yards Studio in Charlottetown, PEI.

Eligibility: The scholarship is open to Year 2 MArch students who have completed the first thesis term.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: First Monday of December

Value: \$1,000

***Nova Scotia Association of Architects Scholarship***

Awarded based on academic excellence to a final year Master of Architecture student who is a permanent resident of Nova Scotia and who plans to enter the architectural profession upon graduating.

Application Type: Automatic Consideration – No Application Required

***The Nova Scotia Association of Architects Prize***

The Nova Scotia Association of Architects gives a prize to a student who, in the final year of the Master of Architecture program, displays an outstanding awareness of the architect's responsibility to society by demonstration in his/her scholarly and design work.

Application Type: Automatic Consideration – No Application Required

***The William Nycum and Associates Limited Scholarship***

This scholarship is presented to a student who strongly demonstrates creative thinking and a passion for architecture.

Eligibility: This scholarship is open to students who have completed the first two terms of the MArch program. Applicants must submit a one-page letter that demonstrates their commitment to architecture.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of the winter term

***Lezlie Oler Prize in Community and Environmental Design***

This prize is presented to one or more students, based on a design proposal for urban beautification in the Halifax Regional Municipality.

Eligibility: Open to undergraduate and graduate students in the Faculty of Architecture and Planning at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: December 10

Value: up to \$1,000

***Salvatore Paradise Scholarship***

Two scholarships are awarded: one to a full-time Year 4 Bachelor of Environmental Design Studies student; and one to a full-time Year 6 Master of Architecture student. They are based on the students' practicality of design, collaboration, improvement during the architecture program, and financial need.

Eligibility: Available to full-time students in the BEDS and MArch programs. Preference is given to students who are permanent residents of Atlantic Canada and who show potential for managing a private practice in architecture. Applicants must submit a School of Architecture bursary application.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of the winter term

Value: \$4,700

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

***The School of Planning Prize***

The School of Planning awards a book prize to a student who has achieved academic excellence in the program and contributed to the life of the school.

Application Type: Automatic Consideration – No Application Required

***School of Planning Achievement in Planning Studies Award***

This prize is awarded in recognition of academic excellence upon completing the first year of the Master of Planning degree program.

Application Type: Automatic Consideration – No Application Required

***The Master of Planning Prize***

This is a book prize given to a graduating student on the basis of academic excellence as well as a demonstrated commitment to community planning.

Application Type: Automatic Consideration – No Application Required

***The School of Planning Project Prize***

The School of Planning Project Prize is awarded to the graduate who has produced the best individual project.

Application Type: Automatic Consideration – No Application Required

***School of Planning Team Project Prize***

The prize is awarded to graduating students in the team completing the most outstanding senior team project.

Application Type: Automatic Consideration – No Application Required

***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

***Bruce and Dorothy Rossetti Scholarships - Planning***

Awarded on the basis of academic excellence to students enrolled in the Master of Planning program.

Eligibility: Available to current students in the Master of Planning and Master of Planning Studies programs at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: April 15

***Bruce and Dorothy Rossetti Scholarships - Architecture***

Scholarships are awarded to up to five Master of Architecture students with a consistently high academic record. The award is intended to assist students in carrying out supervised research prior to their thesis year.

Eligibility: Available to students who have completed the first two terms of the MArch program, based on a research proposal.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of winter term

Value: up to \$3,500

***The Royal Architectural Institute of Canada Honour Roll***

For each School of Architecture, a maximum of four students, from the top 10 percent of the graduating class in the professional degree program, shall receive honour roll certificates from the RAIC, in addition to the student who receives the RAIC Student Medal.

Application Type: Automatic Consideration – No Application Required

***The Royal Architectural Institute of Canada Student Medal***

The Royal Architectural Institute of Canada's Student Medal is awarded annually to a student graduating from a professional degree program in each School of Architecture in Canada who, in the judgment of the faculty of the respective School, has achieved the highest level of academic excellence and/or has completed the outstanding final design thesis for that academic year.

Application Type: Automatic Consideration – No Application Required

***The Shaw Group Masonry Design Award***

This award is presented for the B5 Design project or MArch Thesis project that best features the design potential of clay brick masonry in architecture.

Eligibility: BEDS students (B5 term) and MArch students (M6 term)

Application Type: Contact the Department, School, or College for more information

Value: \$3,000, plus two \$500 honourable mentions

***Student's Medical Response Trust Fund***

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of Dalhousie Faculty along with students, staff, faculty, and friends of Dalhousie. The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this fund, students, staff, faculty, and friends of Dalhousie joined together to provide special funding to assist a student. A committee will decide upon the distribution of funds. Distribution of funding will be subject to the judgment of the committee taking into account the individual circumstances and needs. Applications are made to the Dean of the student's respective Faculty.

Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

***John D. Watson Memorial Scholarship***

This scholarship is awarded to a Master of Architecture student to pursue thesis-related research in green design, sustainability, and/or new technologies. Funds may be used for travel. It is awarded in remembrance of John D. Watson (MArch 1990), who passed away in 1998.

Eligibility: Applicants must have completed the first two terms of the MArch program with a satisfactory academic record. They must submit a proposal of study to be carried out during the MArch work term, followed by a public presentation and research report.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of the winter term

Value: \$4,500

## Planning

***Architecture and Planning Bursaries***

Proceeds from the former TUNS Board of Governors Fund are used at the Dean's discretion. They provide up to five \$1,000 bursaries to assist full-time students entering the winter term of the Bachelor of Environmental Design Studies or Master of Architecture program in the School of Architecture or the Bachelor of Community Design or Master of Planning program in the School of Planning.

Eligibility: Applicants must be making satisfactory academic progress and must demonstrate financial need by submitting a bursary application. Selections are made by the Scholarship Committees of the School of Architecture and the School of Planning.

Application Type: Contact the Department, School, or College for more information

Value: \$1,000

***Brant Wishart Memorial Scholarship***

Brant Wishart Memorial Scholarship is given to a student of Planning who has demonstrated academic excellence and leadership. Value \$1,000, awarded annually in April.

Eligibility: Available to current students in the Master of Planning and Master of Planning Studies programs at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Value: \$1,000

***H. Allen Brooks Traveling Fellowship***

This award is made periodically to an exceptionally promising student who is graduating from (or has recently graduated from) a professional architecture or planning degree program in the Faculty of Architecture and Planning. It enables the recipient to travel and contemplate while observing, sketching, reading, or writing. It provides time to think and mature, while acquiring knowledge that will be useful for their future work and contribution to the profession and society.

Eligibility: Available to graduate students completing their studies in the Faculty of Architecture and Planning at Dalhousie University. See award description for specific eligibility requirements.

Application Type: Contact the Department, School, or College for more information

***Canadian Institute of Planners Student Award for Academic Excellence (Graduate)***

Awarded to a full-time student member of the Canadian Institute of Planners who has achieved the highest academic standing over the length of the MPlan program.

Application Type: Automatic Consideration – No Application Required

***Canadian Institute of Planners Student Scholarships***

Awarded to a student member in good standing with the CIP and enrolled full-time in a recognized planning program. Applications forms are available from the School of Planning and must be received by the CIP national office by the date indicated on the application. Applications are judged on the basis of a student's potential contribution to the planning profession (in theory or in practice) and their potential service to a community or community group.

Eligibility: Available to current students in the Master of Planning and Master of Planning Studies programs at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Wallace and Marie Dykeman Prize in Rural Planning***

A planning student in the final year of study who engages in innovative research on rural planning, who conducts a special project, who develops an inspiring thesis or who shows outstanding service to others.

Application Type: Contact the Department, School, or College for more information

***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***Exxon Mobil Canada Ltd. Scholarship***

Awarded to a student entering a graduate program in the School of Planning with academic excellence and an interest in studying the impacts and design-related issues of energy developments.

Application Type: Contact the Department, School, or College for more information

Value: \$7,000

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***George Lawen / Dixel Developments Scholarship***

Dixel Developments is an award-winning mixed-use property developer focused primarily on residential apartments and the regeneration of existing heritage properties located in the Halifax business district. The George Lawen/Dixel Developments Scholarship was created in 2010 by Louis Lawen to recognize and support the crucial role of planning to the future development of Halifax and the surrounding area by supporting a student who intends to pursue a career in the Maritimes. The scholarship is named in honour of Louis’ father, George Lawen. The scholarship will provide a \$5,000 award to a student entering the final year of the Master of Planning program, with second preference to a student entering the final year of the Master of Architecture program. The student will have demonstrated active involvement in community service and will have a high academic standing and an interest in urban design or urban planning.

Application Type: Contact the Department, School, or College for more information

Value: \$5,000

***Dorothy Leslie Prize***

This prize, named after the former secretary of the School of Planning, is awarded to a student finishing the first year of the Masters program who has made a significant contribution to the life of the school.

Application Type: Automatic Consideration – No Application Required

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***Lezlie Oler Prize in Community and Environmental Design***

This prize is presented to one or more students, based on a design proposal for urban beautification in the Halifax Regional Municipality.

Eligibility: Open to undergraduate and graduate students in the Faculty of Architecture and Planning at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: December 10

Value: up to \$1,000

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

***The School of Planning Prize***

The School of Planning awards a book prize to a student who has achieved academic excellence in the program and contributed to the life of the school.

Application Type: Automatic Consideration – No Application Required



***School of Planning Achievement in Planning Studies Award***

This prize is awarded in recognition of academic excellence upon completing the first year of the Master of Planning degree program.

Application Type: Automatic Consideration – No Application Required

***The Master of Planning Prize***

This is a book prize given to a graduating student on the basis of academic excellence as well as a demonstrated commitment to community planning.

Application Type: Automatic Consideration – No Application Required

***The School of Planning Project Prize***

The School of Planning Project Prize is awarded to the graduate who has produced the best individual project.

Application Type: Automatic Consideration – No Application Required

***School of Planning Team Project Prize***

The prize is awarded to graduating students in the team completing the most outstanding senior team project.

Application Type: Automatic Consideration – No Application Required

***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

***Bruce and Dorothy Rossetti Scholarships - Planning***

Awarded on the basis of academic excellence to students enrolled in the Master of Planning program.

Eligibility: Available to current students in the Master of Planning and Master of Planning Studies programs at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: April 15

***Student's Medical Response Trust Fund***

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of Dalhousie Faculty along with students, staff, faculty, and friends of Dalhousie. The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this fund, students, staff, faculty, and friends of Dalhousie joined together to provide special funding to assist a student. A committee will decide upon the distribution of funds. Distribution of funding will be subject to the judgment of the committee taking into account the individual circumstances and needs. Applications are made to the Dean of the student's respective Faculty.

Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

## Architecture

***Kirsty Bruce Bursary***

This \$1,000 bursary was established in memory of Kirsty Lee St. Clair Bruce (MARCH 2007).

Eligibility: Students entering the final thesis term of the Master of Architecture program, with preference given to female students who are Canadian citizens or permanent residents.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: First day of the winter term

Value: \$1000

***The Henry Adams Medal***

Awarded by the American Institute of Architects to a high-ranking graduating student from the MArch program who has achieved general excellence throughout the program.

Application Type: Automatic Consideration – No Application Required

***Adjeleian Award in the Aesthetics of Structures***

Awarded to a graduating student in either the Master of Architecture program or the Civil Engineering degree program who demonstrates in a project both aesthetic principles in buildings or bridges and unified roots of Architecture and Structural Engineering. The award alternates between Architecture (in odd years) and Engineering (in even years). Application not required (for Architecture).

Eligibility: Available to a Master of Architecture or a Bachelor of Engineering (Civil Engineering) student.

Application Type: Contact the Faculty for more information

***The Alpha Rho Chi Medal***

Alpha Rho Chi, National Social-Professional Fraternity of Architecture, awards the Alpha Rho Chi Medal to a graduating senior of the School of Architecture who has shown an ability for leadership, performed willing service for the school, and gives promise of real professional merit through attitude and personality.

Application Type: Automatic Consideration – No Application Required

***The Alumni Memorial Award***

This award, which was initiated in 1984 in the memory of Mr. Michael Kravosky (BArch 1983), is awarded each year to a graduating student elected by the graduating class for outstanding service to the school in student activities and affairs. The award is made from the proceeds of the Architecture Alumni Memorial Fund and is subject to annual review.

Application Type: Automatic Consideration – No Application Required

***School of Architecture Thesis Prize***

The School of Architecture awards a prize to one or more students who have completed an outstanding design thesis in the Master of Architecture program.

Application Type: Automatic Consideration – No Application Required

***Architecture and Planning Bursaries***

Proceeds from the former TUNS Board of Governors Fund are used at the Dean's discretion. They provide up to five \$1,000 bursaries to assist full-time students entering the winter term of the Bachelor of Environmental Design Studies or Master of Architecture program in the School of Architecture or the Bachelor of Community Design or Master of Planning program in the School of Planning.

Eligibility: Applicants must be making satisfactory academic progress and must demonstrate financial need by submitting a bursary application. Selections are made by the Scholarship Committees of the School of Architecture and the School of Planning.

Application Type: Contact the Department, School, or College for more information

Value: \$1,000

***H. Allen Brooks Traveling Fellowship***

This award is made periodically to an exceptionally promising student who is graduating from (or has recently graduated from) a professional architecture or planning degree program in the Faculty of Architecture and Planning. It enables the recipient to travel and contemplate while observing, sketching, reading, or writing. It provides time to think and mature, while acquiring knowledge that will be useful for their future work and contribution to the profession and society.

Eligibility: Available to graduate students completing their studies in the Faculty of Architecture and Planning at Dalhousie University. See award description for specific eligibility requirements.

Application Type: Contact the Department, School, or College for more information

***Canadian Institute of Steel Construction Architecture Scholarship***

This scholarship, donated by the Canadian Institute of Steel Construction, is awarded to a Master of Architecture student who has completed the first MArch thesis term. It is intended to support thesis design work that uses structural steel in a critical way. Following the completion of the thesis, the student submits a report to CISC for publication.

Eligibility: The scholarship is open to students in the final year of the Master of Architecture program. Applicants must submit a proposal. Selection is made by the School of Architecture.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of the winter term

Value: \$3,000

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Design and Construction Institute of Engineering and Architecture Scholarship***

The Design and Construction Institute (DCI) is a volunteer organization consisting of over 75 industry leaders whose common goal is to promote, foster and advocate for the design and construction industry in Nova Scotia. This fund was established to recognize and support engineering students who are enrolled in an undergraduate program and architecture students who are enrolled in a graduate programs.

Eligibility: Awarded annually to students who show an aptitude for, or are interested in, the design and construction industries in Nova Scotia. Recipients will be selected based on academic achievement and recommendations from professors. Engineering applicants will be in the third or fourth year and will submit a letter to DCI demonstrating their commitment to pursuing a career in the design and/or construction industry. The Architecture recipient will be in the first year of the Master of Architecture program and is not required to submit an application.

Application Type: Faculty of Engineering: Undergraduate In-Course Scholarship Application

Application Deadline to Apply: September 30 (Engineering); no application required for Architecture

Value: \$500 to Engineering, \$500 to Architecture

***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***Jonathan Hart Memorial Fund***

This fund was established in memory of Jonathan Hart (MArch 1996) by Mr. Justice Gordon Hart and Mrs. Catherine Hart, following Jonathan's request to support architecture in the community. Proceeds from this fund are used periodically to bring architectural work to the public, and to encourage young architects and businesses to work together on projects for the betterment of the community.

Eligibility: Available to Master of Architecture students. Selection is made by the School of Architecture.

Application Type: Contact the Department, School, or College for more information

***Kent C. Hurley Architecture Fund***

Funds from the estate of Kent C. Hurley, a former professor at the School of Architecture, will be used periodically to support the school's academic mission. This may involve scholarships, outreach, teaching, and research.

Eligibility: Funds will be allocated by the School of Architecture. This may include scholarships for incoming or current undergraduate and graduate architecture students.

Application Type: Contact the Department, School, or College for more information

***George Lawen / Dixel Developments Scholarship***

Dixel Developments is an award-winning mixed-use property developer focused primarily on residential apartments and the regeneration of existing heritage properties located in the Halifax business district. The George Lawen/Dixel Developments Scholarship was created in 2010 by Louis Lawen to

recognize and support the crucial role of planning to the future development of Halifax and the surrounding area by supporting a student who intends to pursue a career in the Maritimes. The scholarship is named in honour of Louis' father, George Lawen. The scholarship will provide a \$5,000 award to a student entering the final year of the Master of Planning program, with second preference to a student entering the final year of the Master of Architecture program. The student will have demonstrated active involvement in community service and will have a high academic standing and an interest in urban design or urban planning.

Application Type: Contact the Department, School, or College for more information

Value: \$5,000

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Newfoundland and Labrador Association of Architects William J. Ryan Memorial Scholarship***

The Newfoundland and Labrador Association of Architects established this award to an architecture student entering Year 4 of the BEDS program who was a resident of Newfoundland and Labrador prior to beginning post-secondary studies. If no Year 4 students are eligible, the scholarship may be awarded to a student entering Year 5 of the MArch program. Selection will be based on: (a) design ability in assigned projects; (b) practicality of design; (c) aptitude for a subject(s) other than design of architecture and the built environment; (d) development of professional ability; and (e) grades in courses other than design.

Application Type: Automatic Consideration – No Application Required

Value: \$2,000

#### ***Nine Yards Studio Scholarship***

Nine Yards Studio Scholarship, worth \$1,000, supports a student who is doing community-related design work in a Master of Architecture thesis. It is donated by Nine Yards Studio in Charlottetown, PEI.

Eligibility: The scholarship is open to Year 2 MArch students who have completed the first thesis term.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: First Monday of December

Value: \$1,000

#### ***Nova Scotia Association of Architects Scholarship***

Awarded based on academic excellence to a final year Master of Architecture student who is a permanent resident of Nova Scotia and who plans to enter the architectural profession upon graduating.

Application Type: Automatic Consideration – No Application Required

#### ***The Nova Scotia Association of Architects Prize***

The Nova Scotia Association of Architects gives a prize to a student who, in the final year of the Master of Architecture program, displays an outstanding awareness of the architect's responsibility to society by demonstration in his/her scholarly and design work.

Application Type: Automatic Consideration – No Application Required

#### ***The William Nycum and Associates Limited Scholarship***

This scholarship is presented to a student who strongly demonstrates creative thinking and a passion for architecture.

Eligibility: This scholarship is open to students who have completed the first two terms of the MArch program. Applicants must submit a one-page letter that demonstrates their commitment to architecture.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of the winter term

#### ***Lezlie Oler Prize in Community and Environmental Design***

This prize is presented to one or more students, based on a design proposal for urban beautification in the Halifax Regional Municipality.

Eligibility: Open to undergraduate and graduate students in the Faculty of Architecture and Planning at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: December 10

Value: up to \$1,000

#### ***Salvatore Paradise Scholarship***

Two scholarships are awarded: one to a full-time Year 4 Bachelor of Environmental Design Studies student; and one to a full-time Year 6 Master of

Architecture student. They are based on the students' practicality of design, collaboration, improvement during the architecture program, and financial need.

Eligibility: Available to full-time students in the BEDS and MArch programs. Preference is given to students who are permanent residents of Atlantic Canada and who show potential for managing a private practice in architecture. Applicants must submit a School of Architecture bursary application.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of the winter term

Value: \$4,700

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***Bruce and Dorothy Rossetti Scholarships - Architecture***

Scholarships are awarded to up to five Master of Architecture students with a consistently high academic record. The award is intended to assist students in carrying out supervised research prior to their thesis year.

Eligibility: Available to students who have completed the first two terms of the MArch program, based on a research proposal.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of winter term

Value: up to \$3,500

#### ***The Royal Architectural Institute of Canada Honour Roll***

For each School of Architecture, a maximum of four students, from the top 10 percent of the graduating class in the professional degree program, shall receive honour roll certificates from the RAIC, in addition to the student who receives the RAIC Student Medal.

Application Type: Automatic Consideration – No Application Required

#### ***The Royal Architectural Institute of Canada Student Medal***

The Royal Architectural Institute of Canada's Student Medal is awarded annually to a student graduating from a professional degree program in each School of Architecture in Canada who, in the judgment of the faculty of the respective School, has achieved the highest level of academic excellence and/or has completed the outstanding final design thesis for that academic year.

Application Type: Automatic Consideration – No Application Required

#### ***The Shaw Group Masonry Design Award***

This award is presented for the B5 Design project or MArch Thesis project that best features the design potential of clay brick masonry in architecture.

Eligibility: BEDS students (B5 term) and MArch students (M6 term)

Application Type: Contact the Department, School, or College for more information

Value: \$3,000, plus two \$500 honourable mentions

#### ***Student's Medical Response Trust Fund***

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of Dalhousie Faculty along with students, staff, faculty, and friends of Dalhousie. The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this fund, students, staff, faculty, and friends of Dalhousie joined together to provide special funding to assist a student. A committee will decide upon the distribution of funds. Distribution of funding will be subject to the judgment of the committee taking into account the individual circumstances and needs. Applications are made to the Dean of the student's respective Faculty.

Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

#### ***John D. Watson Memorial Scholarship***

This scholarship is awarded to a Master of Architecture student to pursue thesis-related research in green design, sustainability, and/or new technologies. Funds may be used for travel. It is awarded in remembrance of John D. Watson (MArch 1990), who passed away in 1998.

Eligibility: Applicants must have completed the first two terms of the MArch program with a satisfactory academic record. They must submit a proposal of study to be carried out during the MArch work term, followed by a public presentation and research report.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: first day of the winter term

Value: \$4,500

## Faculty of Arts and Social Sciences

### Introduction

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## All Faculty of Arts and Social Sciences Awards

### **Tom & Ada Jennex Graduate Scholarship**

The recipient must be an MA or PhD candidate in the Department of History who is writing a thesis exploring the field of the Atlantic world and its relationship to the study of Atlantic Canada.

Eligibility: MA or PhD History Students are eligible.

Application Type: Automatic Consideration – No Application Required

### **The Bowes Scholarship in History**

This scholarship has been endowed by Janeen E. Bowes to support a graduate student in the history of the Halifax Explosion, of Halifax, or Nova Scotia more generally, or, in the absence of qualifying students working in these areas, in the history of Atlantic Canada.

Eligibility: To be eligible, students must have earned marks of A- or better in Master's course work of Doctoral field exams.

Application Type: Automatic Consideration – No Application Required

Value: \$1,000

### **The Douglas Butler Memorial Prize**

The Butler Memorial fund was established in memory of Dr. Douglas Butler, a good friend of the Philosophy Department who had taught Summer Session courses with us, and who died suddenly in Halifax in 1991 at the age of 34. The prize is awarded annually for the best MA student term paper.

Application Type: Automatic Consideration – No Application Required

### **Dalhousie Student Union Student Accessibility Fund Award**

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

### **The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English**

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

### **Faculty of Graduate Studies Emergency Bursaries**

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student

Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The C. Bruce Fergusson Prize***

This prize was established to honour the memory of C. Bruce Fergusson, Provincial Archivist, and associate professor of History at Dalhousie University. The selection criteria emphasize depth of scholarship, meticulous research, and excellent writing.

Eligibility: Awarded annually to the History Department's leading Honours student who enrolls in a Master's degree at Dalhousie in the field of Nova Scotia history.

Application Type: Automatic Consideration – No Application Required

#### ***The Linda Marie Gillingwater Rainsberry Bursary/Scholarship***

The bursary was established in 2009 to honor the memory of Linda Gillingwater Rainsberry - student, writer, editor, educator, fundraiser, conflict mediator, television producer and curriculum designer. The bursary, valued at \$1,500, will be used to assist single mothers whose area of study is in the Faculty of Arts and Social Sciences and whose research incorporates a social justice analysis. Preference is given to a student whose research is on women studies, however, single mothers enrolled in any graduate program at Dalhousie, are eligible to apply. Dalhousie University also offers a Linda Marie Gillingwater Rainsberry Scholarship in the amount of \$1,500. The same preference is given as the Bursary, but the recipient must also show academic excellence. The same student can apply for and hold both the bursary and scholarship.

Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Gilbert F. Jennex History Scholarship***

This annual in-course scholarship created by Dalhousie History graduate Gilbert F. Jennex will be awarded to an undergraduate student in her or his third year of study with a concentration in History. Preference will be given to students whose area of interest is the Atlantic World and its relationship to the study of Atlantic Canada.

Application Type: Automatic Consideration – No Application Required

#### ***The Dr. P. Anthony Johnstone Memorial Bursary***

The donors established this fund in 1994 to honour the memory of Dr. P. Anthony (Tony) Johnstone (1931-1989), scholar, educator and Director of the Nova Scotia Human Rights Commission, 1985-1989. It is used to assist a humanities or social science graduate student who has a record of interest and involvement in social justice and human rights.

Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Patricia Keene Scholarship in English***

Awarded to deserving students in English in memory of Patricia (Pat) Keene (1924 - 2006).

Application Type: Automatic Consideration – No Application Required

#### ***The Mohini Mathur Memorial Bursary in Indian Philosophical Systems***

This bursary celebrates the interests of Mohini Mathur in Indian philosophical systems and is to be awarded to a student who demonstrates a genuine interest in furthering their study in Hindu Religion or Indian philosophy and those systems of thought and intellectual culture emerging from the Indian subcontinent. The award was established in the memory of Mrs. Mohini Mathur by her family. Mohini was born on 17 March 1939 in Patna, India. She was

an educator with a passion for higher learning. She immigrated to Canada in 1969 to join her husband Kripa Shanker Mathur, P. Eng. They brought up two children, their son Dave and daughter Sunita. Mohini was a lifelong learner and maintained an active interest in religion, astronomy, and philosophy. Until her death in 2011, she was a student of Religion and Philosophy at Dalhousie University.

Eligibility: Available to an undergraduate or graduate student with a sincere and demonstrated interest in achieving higher education in the study of Indian thought and ideas and with a clear plan to continue in this field of scholarship and plans to publish or present the results of their studies at an academic conference. The recipient will have demonstrated financial need and satisfactory academic standing.

Application Type: Contact the Faculty for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***The Malcolm Ross Award in Canadian Literature***

Established to honour the late Malcolm Ross, founding editor of the New Canadian Library and long-time member of the Department of English, a prize to be awarded to an outstanding Master of Arts or Doctor of Philosophy thesis on Canadian Literature. McClelland and Stewart have generously provided the funding to recognize Professor Ross' role in forwarding the study of Canadian literature.

Application Type: Automatic Consideration – No Application Required

#### ***The Malcolm Ross Graduate Scholarship in English***

Established by his colleagues and friends in memory of Malcolm Ross, distinguished literary scholar and editor and long-time member of the English Department. A graduate scholarship will be awarded by the department's Graduate Committee to an outstanding student entering the MA program in English.

Application Type: Automatic Consideration – No Application Required

#### ***The James W. Tupper Graduate Fellowship in English***

Two or three fellowships are awarded by the English Department, on the recommendation of the Undergraduate Committee, to students selected on the criteria of the GPA of all English courses at the 2000 level and beyond and a clear indication that the student(s) will go on to do graduate work. The work must be done at a university approved by the faculty; it need not be held at Dalhousie.

Eligibility: Available to a final year undergraduate English student from Dalhousie or King's.

Application Type: Contact the Department, School, or College for more information

## **Classics**

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information



#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Linda Marie Gillingwater Rainsberry Bursary/Scholarship***

The bursary was established in 2009 to honor the memory of Linda Gillingwater Rainsberry - student, writer, editor, educator, fundraiser, conflict mediator, television producer and curriculum designer. The bursary, valued at \$1,500, will be used to assist single mothers whose area of study is in the Faculty of Arts and Social Sciences and whose research incorporates a social justice analysis. Preference is given to a student whose research is on women studies, however, single mothers enrolled in any graduate program at Dalhousie, are eligible to apply. Dalhousie University also offers a Linda Marie Gillingwater Rainsberry Scholarship in the amount of \$1,500. The same preference is given as the Bursary, but the recipient must also show academic excellence. The same student can apply for and hold both the bursary and scholarship.

Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Dr. P. Anthony Johnstone Memorial Bursary***

The donors established this fund in 1994 to honour the memory of Dr. P. Anthony (Tony) Johnstone (1931-1989), scholar, educator and Director of the Nova Scotia Human Rights Commission, 1985-1989. It is used to assist a humanities or social science graduate student who has a record of interest and involvement in social justice and human rights.

Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information  
Application Deadline to Apply: April 1  
Value: \$1,500

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## English

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***The Linda Marie Gillingwater Rainsberry Bursary/Scholarship***

The bursary was established in 2009 to honor the memory of Linda Gillingwater Rainsberry - student, writer, editor, educator, fundraiser, conflict mediator, television producer and curriculum designer. The bursary, valued at \$1,500, will be used to assist single mothers whose area of study is in the Faculty of Arts and Social Sciences and whose research incorporates a social justice analysis. Preference is given to a student whose research is on women studies, however, single mothers enrolled in any graduate program at Dalhousie, are eligible to apply. Dalhousie University also offers a Linda Marie Gillingwater Rainsberry Scholarship in the amount of \$1,500. The same preference is given as the Bursary, but the recipient must also show academic excellence. The Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***The Dr. P. Anthony Johnstone Memorial Bursary***

The donors established this fund in 1994 to honour the memory of Dr. P. Anthony (Tony) Johnstone (1931-1989), scholar, educator, and Director of the Nova Scotia Human Rights Commission, 1985-1989. It is used to assist a humanities or social science graduate student who has a record of interest and involvement in social justice and human rights.

Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

***Patricia Keene Scholarship in English***

Awarded to deserving students in English in memory of Patricia (Pat) Keene (1924 - 2006).

Application Type: Automatic Consideration – No Application Required

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

***The Malcolm Ross Award in Canadian Literature***

Established to honour the late Malcolm Ross, founding editor of the New Canadian Library and long-time member of the Department of English, a prize to be awarded to an outstanding Master of Arts or Doctor of Philosophy thesis on Canadian Literature. McClelland and Stewart have generously provided the funding to recognize Professor Ross' role in forwarding the study of Canadian literature.

Application Type: Automatic Consideration – No Application Required

***The Malcolm Ross Graduate Scholarship in English***

Established by his colleagues and friends in memory of Malcolm Ross, distinguished literary scholar and editor and long-time member of the English

Department. A graduate scholarship will be awarded by the department's Graduate Committee to an outstanding student entering the MA program in English.

Application Type: Automatic Consideration – No Application Required

#### ***The James W. Tupper Graduate Fellowship in English***

Two or three fellowships are awarded by the English Department, on the recommendation of the Undergraduate Committee, to students selected on the criteria of the GPA of all English courses at the 2000 level and beyond and a clear indication that the student(s) will go on to do graduate work. The work must be done at a university approved by the faculty; it need not be held at Dalhousie.

Eligibility: Available to a final year undergraduate English student from Dalhousie or King's.

Application Type: Contact the Department, School, or College for more information

## **French**

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Linda Marie Gillingwater Rainsberry Bursary/Scholarship***

The bursary was established in 2009 to honor the memory of Linda Gillingwater Rainsberry - student, writer, editor, educator, fundraiser, conflict mediator, television producer and curriculum designer. The bursary, valued at \$1,500, will be used to assist single mothers whose area of study is in the Faculty of Arts and Social Sciences and whose research incorporates a social justice analysis. Preference is given to a student whose research is on women studies, however, single mothers enrolled in any graduate program at Dalhousie, are eligible to apply. Dalhousie University also offers a Linda Marie Gillingwater Rainsberry Scholarship in the amount of \$1,500. The same preference is given as the Bursary, but the recipient must also show academic excellence. The same student can apply for and hold both the bursary and scholarship.

Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Dr. P. Anthony Johnstone Memorial Bursary***

The donors established this fund in 1994 to honour the memory of Dr. P. Anthony (Tony) Johnstone (1931-1989), scholar, educator, and Director of the Nova Scotia Human Rights Commission, 1985-1989. It is used to assist a humanities or social science graduate student who has a record of interest and involvement in social justice and human rights.

Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **German**

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Linda Marie Gillingwater Rainsberry Bursary/Scholarship***

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Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

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Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Dr. P. Anthony Johnstone Memorial Bursary***

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Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The A.S. Mowat Prize***

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **History**

### ***Tom & Ada Jennex Graduate Scholarship***

The recipient must be an MA or PhD candidate in the Department of History who is writing a thesis exploring the field of the Atlantic world and its relationship to the study of Atlantic Canada.

Eligibility: MA or PhD History Students are eligible.

Application Type: Automatic Consideration – No Application Required

### ***The Bowes Scholarship in History***

This scholarship has been endowed by Janeen E. Bowes to support a graduate student in the history of the Halifax Explosion, of Halifax, or Nova Scotia more generally, or, in the absence of qualifying students working in these areas, in the history of Atlantic Canada.

Eligibility: To be eligible, students must have earned marks of A- or better in Master's course work of Doctoral field exams.

Application Type: Automatic Consideration – No Application Required

Value: \$1,000

### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

### ***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

### ***The C. Bruce Fergusson Prize***

This prize was established to honour the memory of C. Bruce Fergusson, Provincial Archivist, and associate professor of History at Dalhousie University. The selection criteria emphasize depth of scholarship, meticulous research, and excellent writing.

Eligibility: Awarded annually to the History Department's leading Honours student who enrolls in a Master's degree at Dalhousie in the field of Nova Scotia history.

Application Type: Automatic Consideration – No Application Required

### ***The Linda Marie Gillingwater Rainsberry Bursary/Scholarship***

The bursary was established in 2009 to honor the memory of Linda Gillingwater Rainsberry - student, writer, editor, educator, fundraiser, conflict mediator, television producer and curriculum designer. The bursary, valued at \$1,500, will be used to assist single mothers whose area of study is in the Faculty of Arts and Social Sciences and whose research incorporates a social justice analysis. Preference is given to a student whose research is on women studies,

however, single mothers enrolled in any graduate program at Dalhousie, are eligible to apply. Dalhousie University also offers a Linda Marie Gillingwater Rainsberry Scholarship in the amount of \$1,500. The same preference is given as the Bursary, but the recipient must also show academic excellence. The same student can apply for and hold both the bursary and scholarship.

Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

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Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Gilbert F. Jennex History Scholarship***

This annual in-course scholarship created by Dalhousie History graduate Gilbert F. Jennex will be awarded to an undergraduate student in her or his third year of study with a concentration in History. Preference will be given to students whose area of interest is the Atlantic World and its relationship to the study of Atlantic Canada.

Application Type: Automatic Consideration – No Application Required

#### ***The Dr. P. Anthony Johnstone Memorial Bursary***

The donors established this fund in 1994 to honour the memory of Dr. P. Anthony (Tony) Johnstone (1931-1989), scholar, educator and Director of the Nova Scotia Human Rights Commission, 1985-1989. It is used to assist a humanities or social science graduate student who has a record of interest and involvement in social justice and human rights.

Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

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Application Type: Contact the Department, School, or College for more information

## International Development Studies

### ***Dalhousie Student Union Student Accessibility Fund Award***

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Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

### ***The Linda Marie Gillingwater Rainsberry Bursary/Scholarship***

The bursary was established in 2009 to honor the memory of Linda Gillingwater Rainsberry - student, writer, editor, educator, fundraiser, conflict mediator, television producer and curriculum designer. The bursary, valued at \$1,500, will be used to assist single mothers whose area of study is in the Faculty of Arts and Social Sciences and whose research incorporates a social justice analysis. Preference is given to a student whose research is on women studies, however, single mothers enrolled in any graduate program at Dalhousie, are eligible to apply. Dalhousie University also offers a Linda Marie Gillingwater Rainsberry Scholarship in the amount of \$1,500. The same preference is given as the Bursary, but the recipient must also show academic excellence. The same student can apply for and hold both the bursary and scholarship.

Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***The Dr. P. Anthony Johnstone Memorial Bursary***

The donors established this fund in 1994 to honour the memory of Dr. P. Anthony (Tony) Johnstone (1931-1989), scholar, educator, and Director of the Nova Scotia Human Rights Commission, 1985-1989. It is used to assist a humanities or social science graduate student who has a record of interest and involvement in social justice and human rights.

Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Music - Fountain School of Performing Arts**

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***The Linda Marie Gillingwater Rainsberry Bursary/Scholarship***

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Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***The John and Lina Graham Commonwealth Bursary***

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Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

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Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

***The A.S. Mowat Prize***

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

# Philosophy

## ***The Douglas Butler Memorial Prize***

The Butler Memorial fund was established in memory of Dr. Douglas Butler, a good friend of the Philosophy Department who had taught Summer Session courses with us, and who died suddenly in Halifax in 1991 at the age of 34. The prize is awarded annually for the best MA student term paper.

Application Type: Automatic Consideration – No Application Required

## ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

## ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

## ***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

## ***The Linda Marie Gillingwater Rainsberry Bursary/Scholarship***

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Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

## ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

## ***The John and Lina Graham Commonwealth Bursary***

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Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

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Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Mohini Mathur Memorial Bursary in Indian Philosophical Systems***

This bursary celebrates the interests of Mohini Mathur in Indian philosophical systems and is to be awarded to a student who demonstrates a genuine interest in furthering their study in Hindu Religion or Indian philosophy and those systems of thought and intellectual culture emerging from the Indian subcontinent. The award was established in the memory of Mrs. Mohini Mathur by her family. Mohini was born on 17 March 1939 in Patna, India. She was an educator with a passion for higher learning. She immigrated to Canada in 1969 to join her husband Kripa Shanker Mathur, P. Eng. They brought up two children, their son Dave and daughter Sunita. Mohini was a lifelong learner and maintained an active interest in religion, astronomy, and philosophy. Until her death in 2011, she was a student of Religion and Philosophy at Dalhousie University.

Eligibility: Available to an undergraduate or graduate student with a sincere and demonstrated interest in achieving higher education in the study of Indian thought and ideas and with a clear plan to continue in this field of scholarship and plans to publish or present the results of their studies at an academic conference. The recipient will have demonstrated financial need and satisfactory academic standing.

Application Type: Contact the Faculty for more information

#### ***The A.S. Mowat Prize***

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

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Application Type: Contact the Department, School, or College for more information

## **Political Science**

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

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Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

***The Irving and Jeanne Glovin Award***

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Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***The John and Lina Graham Commonwealth Bursary***

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Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

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Application Deadline to Apply: October 31

Value: \$750

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Application Type: Contact the Department, School, or College for more information

## **Sociology and Social Anthropology**

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Application Type: Contact awards@dal.ca for more information

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Application Type: Contact the Department, School, or College for more information

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

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Eligibility: Priority given to a female graduate student who is a single mother.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: December 15

Value: \$1,500 each

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Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

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Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Dr. P. Anthony Johnstone Memorial Bursary***

The donors established this fund in 1994 to honour the memory of Dr. P. Anthony (Tony) Johnstone (1931-1989), scholar, educator, and Director of the Nova Scotia Human Rights Commission, 1985-1989. It is used to assist a humanities or social science graduate student who has a record of interest and involvement in social justice and human rights.

Eligibility: Available to all eligible graduate students.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Faculty of Computer Science**

### **Introduction**

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## **All Faculty of Computer Science Awards**

#### ***Ada Byron Award***

The Ada Byron Award recognizes the leadership and contributions of an individual to increase and promote the involvement of women in Computer Science.

Eligibility: Available to undergraduate and graduate students registered in the Faculty of Computer Science.

Application Type: Contact the Faculty for more information



Application Deadline to Apply: Awarded by nomination in the fall term. Contact [undergrad@cs.dal.ca](mailto:undergrad@cs.dal.ca) for details.

#### ***Citizenship Award***

The Citizenship Award recognizes the contributions of an individual to build a community atmosphere within the Faculty of Computer Science.

Eligibility: Available to undergraduate and graduate students registered in the Faculty of Computer Science.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: Awarded by nomination in the fall term. Contact [undergrad@cs.dal.ca](mailto:undergrad@cs.dal.ca) for details.

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Leadership Award***

The Leadership Award recognizes the leadership and contributions of an individual in building a community atmosphere within the Faculty of Computer Science.

Eligibility: Available to undergraduate and graduate students registered in the Faculty of Computer Science.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: Awarded by nomination in the fall term. Contact [undergrad@cs.dal.ca](mailto:undergrad@cs.dal.ca) for details.

### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

### ***OZ Optics Limited Graduate Scholarship***

The OZ Optics Limited Graduate Scholarship was established to provide an annual scholarship to a Master's or PhD student studying in the area of physics, electrical engineering, or computer science. First preference will be given to applicants working in the area of fibre optics or closely related field. Second preference will be given to any graduate student enrolled in physics, electrical engineering, or computer science. Thesis Master's and Doctoral students with a first-class average who intend to or are pursuing studies and research related to fibre optics or a closely related field are eligible to apply. Scholarships will be for one year only. Award recipients will be identified by the Faculty of Graduate Studies Scholarship Committee, including an employee of OZ Optics. The general Dalhousie Graduate Award Rules are applied. The Award is valued at \$10,000 for a 12-month academic year (one award per year). It is tenable only at Dalhousie University. Fees are not waived and must be paid out of the award and students must be accepted to Dalhousie before they apply.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: May 15

Value: \$10,000

### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

### ***Student's Medical Response Trust Fund***

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of Dalhousie Faculty along with students, staff, faculty, and friends of Dalhousie. The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this fund, students, staff, faculty, and friends of Dalhousie joined together to provide special funding to assist a student. A committee will decide upon the distribution of funds. Distribution of funding will be subject to the judgment of the committee taking into account the individual circumstances and needs. Applications are made to the Dean of the student's respective Faculty.

Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

## **Faculty of Engineering**

## **Introduction**

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## **All Faculty of Engineering Awards**

### ***Adjeleian Award in the Aesthetics of Structures***

Awarded to a graduating student in either the Master of Architecture program or the Civil Engineering degree program who demonstrates in a project both aesthetic principles in buildings or bridges and unified roots of Architecture and Structural Engineering. The award alternates between Architecture (in odd

years) and Engineering (in even years). Application not required (for Architecture).  
Eligibility: Available to a Master of Architecture or a Bachelor of Engineering (Civil Engineering) student.  
Application Type: Contact the Faculty for more information

***Atlantic Farm Mechanization Show Graduate Scholarship in Engineering***

Presented annually to the student graduating in Environmental Engineering.  
Eligibility: Available to students completing the Master of Engineering or Master of Applied Science programs in Environmental Engineering at Dalhousie University.  
Application Type: Contact the Department, School, or College for more information

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.  
Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.  
Application Type: Contact awards@dal.ca for more information  
Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.  
Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.  
Application Type: Contact the Department, School, or College for more information

***Design and Construction Institute of Engineering and Architecture Scholarship***

The Design and Construction Institute (DCI) is a volunteer organization consisting of over 75 industry leaders whose common goal is to promote, foster and advocate for the design and construction industry in Nova Scotia. This fund was established to recognize and support engineering students who are enrolled in an undergraduate program and architecture students who are enrolled in a graduate programs.  
Eligibility: Awarded annually to students who show an aptitude for, or are interested in, the design and construction industries in Nova Scotia. Recipients will be selected based on academic achievement and recommendations from professors. Engineering applicants will be in the third or fourth year and will submit a letter to DCI demonstrating their commitment to pursuing a career in the design and/or construction industry. The Architecture recipient will be in the first year of the Master of Architecture program and is not required to submit an application.  
Application Type: Faculty of Engineering: Undergraduate In-Course Scholarship Application  
Application Deadline to Apply: September 30 (Engineering); no application required for Architecture  
Value: \$500 to Engineering, \$500 to Architecture

***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.  
Application Type: Contact the Faculty for more information  
Value: Maximum of \$1,000

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.  
Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.  
Application Type: Contact the Faculty for more information  
Application Deadline to Apply: mid-February

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate

students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Dr. S. K. Malhotra Graduate Scholarship***

The scholarship was established by his family and friends in memory of Dr. S. K. Malhotra, former Dean of Graduate Studies and Professor of Civil Engineering at TUNS. Awarded to a student accepted to the Civil Engineering graduate program, with preference to a student from India. The area of research carried out shall be in the field of Structural Engineering.

Eligibility: Available to students entering the Master of Engineering, Master of Applied Science, or Doctor of Philosophy programs at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 31

#### ***The Medjuck Scholarship in Energy Studies***

Awarded based on academic achievement by Scotia Energy Resources Limited, an affiliate of The Centennial Group of Companies Limited, to a student accepted to a graduate program in the Faculty of Engineering with a research project in the field of Energy Studies. The scholarship may be renewed subject to satisfactory progress. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to students entering the Master of Engineering, Master of Applied Science, or Doctor of Philosophy programs at Dalhousie University.

See award description for specific eligibility requirements.

Application Type: Contact the Department, School, or College for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***OZ Optics Limited Graduate Scholarship***

The OZ Optics Limited Graduate Scholarship was established to provide an annual scholarship to a Master's or PhD student studying in the area of physics, electrical engineering, or computer science. First preference will be given to applicants working in the area of fibre optics or closely related field. Second preference will be given to any graduate student enrolled in physics, electrical engineering, or computer science. Thesis Master's and Doctoral students with a first-class average who intend to or are pursuing studies and research related to fibre optics or a closely related field are eligible to apply. Scholarships will be for one year only. Award recipients will be identified by the Faculty of Graduate Studies Scholarship Committee, including an employee of OZ Optics. The general Dalhousie Graduate Award Rules are applied. The Award is valued at \$10,000 for a 12-month academic year (one award per year). It is tenable only at Dalhousie University. Fees are not waived and must be paid out of the award and students must be accepted to Dalhousie before they apply.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: May 15

Value: \$10,000

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***Bruce and Dorothy Rossetti Engineering Research Scholarships***

Awarded based on a student's academic achievement, letters of reference, and other financial support currently being received. International students are not eligible for this award during their first year of graduate study at Dalhousie. This scholarship may be renewed subject to satisfactory academic progress.

Eligibility: Available to a graduate student in financial need in the Faculty of Engineering.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: May 31

#### ***Student's Medical Response Trust Fund***

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of Dalhousie Faculty along with students, staff, faculty, and friends of Dalhousie. The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this fund, students, staff, faculty, and friends of Dalhousie joined together to provide special funding to assist a student. A committee will decide upon the distribution of funds. Distribution of funding will be subject to the judgment of the committee taking into account the individual circumstances and needs. Applications are made to the Dean of the student's respective Faculty.

Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

#### ***The Dr. Stirling Whiteway Graduate Scholarship in Materials Engineering***

Established in memory of Dr. Stirling Whiteway, former Principal Research Officer, NRC Halifax, and adjunct professor of Metallurgical Engineering. Awarded based on academic record to an outstanding applicant, based on the academic record of the applicant in the final two years of their undergraduate engineering degree, with preference to a candidate from Nova Scotia who is registered in the Materials Engineering graduate program. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to an entering graduate student in the Faculty of Engineering.

Application Type: Contact the Department, School, or College for more information

## **Civil and Resource Engineering**

#### ***Adjeleian Award in the Aesthetics of Structures***

Awarded to a graduating student in either the Master of Architecture program or the Civil Engineering degree program who demonstrates in a project both aesthetic principles in buildings or bridges and unified roots of Architecture and Structural Engineering. The award alternates between Architecture (in odd years) and Engineering (in even years). Application not required (for Architecture).

Eligibility: Available to a Master of Architecture or a Bachelor of Engineering (Civil Engineering) student.

Application Type: Contact the Faculty for more information

#### ***Atlantic Farm Mechanization Show Graduate Scholarship in Engineering***

Presented annually to the student graduating in Environmental Engineering.

Eligibility: Available to students completing the Master of Engineering or Master of Applied Science programs in Environmental Engineering at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Design and Construction Institute of Engineering and Architecture Scholarship***

The Design and Construction Institute (DCI) is a volunteer organization consisting of over 75 industry leaders whose common goal is to promote, foster and advocate for the design and construction industry in Nova Scotia. This fund was established to recognize and support engineering students who are enrolled in an undergraduate program and architecture students who are enrolled in a graduate programs.

Eligibility: Awarded annually to students who show an aptitude for, or are interested in, the design and construction industries in Nova Scotia. Recipients will be selected based on academic achievement and recommendations from professors. Engineering applicants will be in the third or fourth year and will submit a letter to DCI demonstrating their commitment to pursuing a career in the design and/or construction industry. The Architecture recipient will be in the first year of the Master of Architecture program and is not required to submit an application.

Application Type: Faculty of Engineering: Undergraduate In-Course Scholarship Application

Application Deadline to Apply: September 30 (Engineering); no application required for Architecture

Value: \$500 to Engineering, \$500 to Architecture

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Irving and Jeanne Glovin Award***

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Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

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Eligibility: Available to students entering the Master of Engineering, Master of Applied Science, or Doctor of Philosophy programs at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 31

#### ***The Medjuck Scholarship in Energy Studies***

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Eligibility: Available to students entering the Master of Engineering, Master of Applied Science, or Doctor of Philosophy programs at Dalhousie University. See award description for specific eligibility requirements.

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community

involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

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Eligibility: Available to a graduate student in financial need in the Faculty of Engineering.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: May 31

#### ***Student's Medical Response Trust Fund***

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of Dalhousie Faculty along with students, staff, faculty, and friends of Dalhousie. The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this fund, students, staff, faculty, and friends of Dalhousie joined together to provide special funding to assist a student. A committee will decide upon the distribution of funds. Distribution of funding will be subject to the judgment of the committee taking into account the individual circumstances and needs. Applications are made to the Dean of the student's respective Faculty.

Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

#### ***The Dr. Stirling Whiteway Graduate Scholarship in Materials Engineering***

Established in memory of Dr. Stirling Whiteway, former Principal Research Officer, NRC Halifax, and adjunct professor of Metallurgical Engineering. Awarded based on academic record to an outstanding applicant, based on the academic record of the applicant in the final two years of their undergraduate engineering degree, with preference to a candidate from Nova Scotia who is registered in the Materials Engineering graduate program. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to an entering graduate student in the Faculty of Engineering.

Application Type: Contact the Department, School, or College for more information

## **Electrical and Computer Engineering**

#### ***Atlantic Farm Mechanization Show Graduate Scholarship in Engineering***

Presented annually to the student graduating in Environmental Engineering.

Eligibility: Available to students completing the Master of Engineering or Master of Applied Science programs in Environmental Engineering at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Design and Construction Institute of Engineering and Architecture Scholarship***

The Design and Construction Institute (DCI) is a volunteer organization consisting of over 75 industry leaders whose common goal is to promote, foster and

advocate for the design and construction industry in Nova Scotia. This fund was established to recognize and support engineering students who are enrolled in an undergraduate program and architecture students who are enrolled in a graduate programs.

Eligibility: Awarded annually to students who show an aptitude for, or are interested in, the design and construction industries in Nova Scotia. Recipients will be selected based on academic achievement and recommendations from professors. Engineering applicants will be in the third or fourth year and will submit a letter to DCI demonstrating their commitment to pursuing a career in the design and/or construction industry. The Architecture recipient will be in the first year of the Master of Architecture program and is not required to submit an application.

Application Type: Faculty of Engineering: Undergraduate In-Course Scholarship Application

Application Deadline to Apply: September 30 (Engineering); no application required for Architecture

Value: \$500 to Engineering, \$500 to Architecture

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Medjuck Scholarship in Energy Studies***

Awarded based on academic achievement by Scotia Energy Resources Limited, an affiliate of The Centennial Group of Companies Limited, to a student accepted to a graduate program in the Faculty of Engineering with a research project in the field of Energy Studies. The scholarship may be renewed subject to satisfactory progress. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to students entering the Master of Engineering, Master of Applied Science, or Doctor of Philosophy programs at Dalhousie University.

See award description for specific eligibility requirements.

Application Type: Contact the Department, School, or College for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***OZ Optics Limited Graduate Scholarship***

The OZ Optics Limited Graduate Scholarship was established to provide an annual scholarship to a Master's or PhD student studying in the area of physics, electrical engineering, or computer science. First preference will be given to applicants working in the area of fibre optics or closely related field. Second preference will be given to any graduate student enrolled in physics, electrical engineering, or computer science. Thesis Master's and Doctoral students with



a first-class average who intend to or are pursuing studies and research related to fibre optics or a closely related field are eligible to apply. Scholarships will be for one year only. Award recipients will be identified by the Faculty of Graduate Studies Scholarship Committee, including an employee of OZ Optics. The general Dalhousie Graduate Award Rules are applied. The Award is valued at \$10,000 for a 12-month academic year (one award per year). It is tenable only at Dalhousie University. Fees are not waived and must be paid out of the award and students must be accepted to Dalhousie before they apply.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: May 15

Value: \$10,000

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***Bruce and Dorothy Rossetti Engineering Research Scholarships***

Awarded based on a student's academic achievement, letters of reference, and other financial support currently being received. International students are not eligible for this award during their first year of graduate study at Dalhousie. This scholarship may be renewed subject to satisfactory academic progress.

Eligibility: Available to a graduate student in financial need in the Faculty of Engineering.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: May 31

#### ***Student's Medical Response Trust Fund***

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of Dalhousie Faculty along with students, staff, faculty, and friends of Dalhousie. The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this fund, students, staff, faculty, and friends of Dalhousie joined together to provide special funding to assist a student. A committee will decide upon the distribution of funds. Distribution of funding will be subject to the judgment of the committee taking into account the individual circumstances and needs. Applications are made to the Dean of the student's respective Faculty.

Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

#### ***The Dr. Stirling Whiteway Graduate Scholarship in Materials Engineering***

Established in memory of Dr. Stirling Whiteway, former Principal Research Officer, NRC Halifax, and adjunct professor of Metallurgical Engineering. Awarded based on academic record to an outstanding applicant, based on the academic record of the applicant in the final two years of their undergraduate engineering degree, with preference to a candidate from Nova Scotia who is registered in the Materials Engineering graduate program. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to an entering graduate student in the Faculty of Engineering.

Application Type: Contact the Department, School, or College for more information

## **Engineering Mathematics and Internetworking**

#### ***Atlantic Farm Mechanization Show Graduate Scholarship in Engineering***

Presented annually to the student graduating in Environmental Engineering.

Eligibility: Available to students completing the Master of Engineering or Master of Applied Science programs in Environmental Engineering at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***The Medjuck Scholarship in Energy Studies***

Awarded based on academic achievement by Scotia Energy Resources Limited, an affiliate of The Centennial Group of Companies Limited, to a student accepted to a graduate program in the Faculty of Engineering with a research project in the field of Energy Studies. The scholarship may be renewed subject to satisfactory progress. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to students entering the Master of Engineering, Master of Applied Science, or Doctor of Philosophy programs at Dalhousie University. See award description for specific eligibility requirements.

Application Type: Contact the Department, School, or College for more information

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

***The President's Graduate Teaching Assistant Awards***

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Application Type: Contact the Department, School, or College for more information

***Bruce and Dorothy Rossetti Engineering Research Scholarships***

Awarded based on a student's academic achievement, letters of reference, and other financial support currently being received. International students are not eligible for this award during their first year of graduate study at Dalhousie. This scholarship may be renewed subject to satisfactory academic progress.

Eligibility: Available to a graduate student in financial need in the Faculty of Engineering.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: May 31

***Student's Medical Response Trust Fund***

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Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

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Established in memory of Dr. Stirling Whiteway, former Principal Research Officer, NRC Halifax, and adjunct professor of Metallurgical Engineering. Awarded based on academic record to an outstanding applicant, based on the academic record of the applicant in the final two years of their undergraduate engineering degree, with preference to a candidate from Nova Scotia who is registered in the Materials Engineering graduate program. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to an entering graduate student in the Faculty of Engineering.

Application Type: Contact the Department, School, or College for more information

## Environmental Engineering

***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***The John and Lina Graham Commonwealth Bursary***

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students who find themselves in need of financial aid while in Nova Scotia.

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Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The President's Graduate Teaching Assistant Awards***

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Application Type: Contact the Department, School, or College for more information

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

## **Industrial Engineering**

#### ***Atlantic Farm Mechanization Show Graduate Scholarship in Engineering***

Presented annually to the student graduating in Environmental Engineering.

Eligibility: Available to students completing the Master of Engineering or Master of Applied Science programs in Environmental Engineering at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

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Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

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Application Type: Contact the Department, School, or College for more information

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Eligibility: Awarded annually to students who show an aptitude for, or are interested in, the design and construction industries in Nova Scotia. Recipients will be selected based on academic achievement and recommendations from professors. Engineering applicants will be in the third or fourth year and will submit a letter to DCI demonstrating their commitment to pursuing a career in the design and/or construction industry. The Architecture recipient will be in the first year of the Master of Architecture program and is not required to submit an application.

Application Type: Faculty of Engineering: Undergraduate In-Course Scholarship Application

Application Deadline to Apply: September 30 (Engineering); no application required for Architecture

Value: \$500 to Engineering, \$500 to Architecture

### ***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

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### ***The Medjuck Scholarship in Energy Studies***

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Eligibility: Available to students entering the Master of Engineering, Master of Applied Science, or Doctor of Philosophy programs at Dalhousie University.

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President's Graduate Teaching Assistant Awards***

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Application Type: Contact the Department, School, or College for more information

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Eligibility: Available to a graduate student in financial need in the Faculty of Engineering.

Application Type: Contact the Faculty for more information

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Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

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Eligibility: Available to an entering graduate student in the Faculty of Engineering.

Application Type: Contact the Department, School, or College for more information

## **Mechanical Engineering**

***Atlantic Farm Mechanization Show Graduate Scholarship in Engineering***

Presented annually to the student graduating in Environmental Engineering.

Eligibility: Available to students completing the Master of Engineering or Master of Applied Science programs in Environmental Engineering at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

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***Design and Construction Institute of Engineering and Architecture Scholarship***

The Design and Construction Institute (DCI) is a volunteer organization consisting of over 75 industry leaders whose common goal is to promote, foster and advocate for the design and construction industry in Nova Scotia. This fund was established to recognize and support engineering students who are enrolled in an undergraduate program and architecture students who are enrolled in a graduate programs.

Eligibility: Awarded annually to students who show an aptitude for, or are interested in, the design and construction industries in Nova Scotia. Recipients will be selected based on academic achievement and recommendations from professors. Engineering applicants will be in the third or fourth year and will submit a letter to DCI demonstrating their commitment to pursuing a career in the design and/or construction industry. The Architecture recipient will be in the first year of the Master of Architecture program and is not required to submit an application.

Application Type: Faculty of Engineering: Undergraduate In-Course Scholarship Application

Application Deadline to Apply: September 30 (Engineering); no application required for Architecture

Value: \$500 to Engineering, \$500 to Architecture

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Medjuck Scholarship in Energy Studies***

Awarded based on academic achievement by Scotia Energy Resources Limited, an affiliate of The Centennial Group of Companies Limited, to a student accepted to a graduate program in the Faculty of Engineering with a research project in the field of Energy Studies. The scholarship may be renewed subject to satisfactory progress. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to students entering the Master of Engineering, Master of Applied Science, or Doctor of Philosophy programs at Dalhousie University.

See award description for specific eligibility requirements.

Application Type: Contact the Department, School, or College for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

***Bruce and Dorothy Rossetti Engineering Research Scholarships***

Awarded based on a student's academic achievement, letters of reference, and other financial support currently being received. International students are not eligible for this award during their first year of graduate study at Dalhousie. This scholarship may be renewed subject to satisfactory academic progress.

Eligibility: Available to a graduate student in financial need in the Faculty of Engineering.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: May 31

***Student's Medical Response Trust Fund***

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of Dalhousie Faculty along with students, staff, faculty, and friends of Dalhousie. The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this fund, students, staff, faculty, and friends of Dalhousie joined together to provide special funding to assist a student. A committee will decide upon the distribution of funds. Distribution of funding will be subject to the judgment of the committee taking into account the individual circumstances and needs. Applications are made to the Dean of the student's respective Faculty.

Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

***The Dr. Stirling Whiteway Graduate Scholarship in Materials Engineering***

Established in memory of Dr. Stirling Whiteway, former Principal Research Officer, NRC Halifax, and adjunct professor of Metallurgical Engineering. Awarded based on academic record to an outstanding applicant, based on the academic record of the applicant in the final two years of their undergraduate engineering degree, with preference to a candidate from Nova Scotia who is registered in the Materials Engineering graduate program. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to an entering graduate student in the Faculty of Engineering.

Application Type: Contact the Department, School, or College for more information

## Process Engineering and Applied Science

***Atlantic Farm Mechanization Show Graduate Scholarship in Engineering***

Presented annually to the student graduating in Environmental Engineering.

Eligibility: Available to students completing the Master of Engineering or Master of Applied Science programs in Environmental Engineering at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Design and Construction Institute of Engineering and Architecture Scholarship***

The Design and Construction Institute (DCI) is a volunteer organization consisting of over 75 industry leaders whose common goal is to promote, foster and advocate for the design and construction industry in Nova Scotia. This fund was established to recognize and support engineering students who are enrolled in an undergraduate program and architecture students who are enrolled in a graduate programs.

Eligibility: Awarded annually to students who show an aptitude for, or are interested in, the design and construction industries in Nova Scotia. Recipients will be selected based on academic achievement and recommendations from professors. Engineering applicants will be in the third or fourth year and will submit a letter to DCI demonstrating their commitment to pursuing a career in the design and/or construction industry. The Architecture recipient will be in the first year of the Master of Architecture program and is not required to submit an application.

Application Type: Faculty of Engineering: Undergraduate In-Course Scholarship Application

Application Deadline to Apply: September 30 (Engineering); no application required for Architecture

Value: \$500 to Engineering, \$500 to Architecture



### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

### ***The Medjuck Scholarship in Energy Studies***

Awarded based on academic achievement by Scotia Energy Resources Limited, an affiliate of The Centennial Group of Companies Limited, to a student accepted to a graduate program in the Faculty of Engineering with a research project in the field of Energy Studies. The scholarship may be renewed subject to satisfactory progress. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to students entering the Master of Engineering, Master of Applied Science, or Doctor of Philosophy programs at Dalhousie University.

See award description for specific eligibility requirements.

Application Type: Contact the Department, School, or College for more information

### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

***Bruce and Dorothy Rossetti Engineering Research Scholarships***

Awarded based on a student's academic achievement, letters of reference, and other financial support currently being received. International students are not eligible for this award during their first year of graduate study at Dalhousie. This scholarship may be renewed subject to satisfactory academic progress.

Eligibility: Available to a graduate student in financial need in the Faculty of Engineering.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: May 31

***Student's Medical Response Trust Fund***

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of Dalhousie Faculty along with students, staff, faculty, and friends of Dalhousie. The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this fund, students, staff, faculty, and friends of Dalhousie joined together to provide special funding to assist a student. A committee will decide upon the distribution of funds. Distribution of funding will be subject to the judgment of the committee taking into account the individual circumstances and needs. Applications are made to the Dean of the student's respective Faculty.

Eligibility: Available to any student registered in the Faculty of Architecture & Planning, Computer Science, or Engineering.

Application Type: Contact the Faculty for more information

***The Dr. Stirling Whiteway Graduate Scholarship in Materials Engineering***

Established in memory of Dr. Stirling Whiteway, former Principal Research Officer, NRC Halifax, and adjunct professor of Metallurgical Engineering. Awarded based on academic record to an outstanding applicant, based on the academic record of the applicant in the final two years of their undergraduate engineering degree, with preference to a candidate from Nova Scotia who is registered in the Materials Engineering graduate program. Selection will be made by the Faculty of Engineering Graduate Studies Committee.

Eligibility: Available to an entering graduate student in the Faculty of Engineering.

Application Type: Contact the Department, School, or College for more information

## Petroleum Engineering

***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate

students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

## **Faculty of Health Professions**

### **Introduction**

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## **All Faculty of Health Professions Awards**

#### ***Association of Black Social Workers Bursary***

The Association of Black Social Workers (ABSW) is a volunteer charitable organization consisting of Black Social Workers and Human Service Workers throughout the Province. ABSW offers a bursary to assist full and part time African Canadian students who are attending a recognized university and who are studying towards a social work degree. The applicant must apply in writing to the Chairperson of the Bursary Committee annually before October 15th. The application should be accompanied by a cover letter, demonstrating your need for this bursary; a complete resume, outlining the applicant's paid and unpaid work in the social field; and two letters of reference, one academic and one work or community related. Each reference should speak to the applicant's suitability to the social work field.

Eligibility: Priority will be given to those who are actively involved with the Association of Black Social Workers.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: October 15

#### ***Elizabeth Bell Scholarship MSc (OT) Entry level and Post-Professional Awards***

The Elizabeth Bell Scholarship supports the rapid expansion of occupational therapy knowledge development and knowledge transfer through entry level, post-professional, and PhD studies. In the Entry-level program, the award will be given to a student who has achieved excellent evaluations in all fieldwork courses. Occupational therapists in the post-professional masters who achieve a grade of A or higher in their practicum course are eligible for this award. Occupational therapists in a Dalhousie PhD program are eligible for consideration based on their PhD application Statement of Interest.

Application Type: Automatic Consideration – No Application Required

#### ***Canadian Physiotherapy Association Award***

A certificate and first year membership in the Canadian Physiotherapy Association constitute this annual award. It is presented to the student who has achieved the highest aggregate percentage in academic and clinical physiotherapy education.

Application Type: Automatic Consideration – No Application Required

***Canadian Physiotherapy Cardio-Respiratory/CPA Student Excellence Award***

This award is given at convocation in recognition of outstanding achievement in cardio-respiratory physiotherapy.

Application Type: Automatic Consideration – No Application Required

***CAOT Student Award***

This award is given to the student who has achieved the highest academic standing in occupational therapy theory courses.

Application Type: Automatic Consideration – No Application Required

***Cardio-Respiratory Award***

This award initiated by an anonymous donor recognizes excellence in cardiorespiratory physiotherapy. It is awarded to the student who achieves the highest academic and clinical standing in all components of cardiorespiratory physiotherapy.

Application Type: Automatic Consideration – No Application Required

***Margaret Cragg Award***

This award was established by the family and friends in honour of Margaret M. Cragg, who pioneered the movement against violence toward women and in the practice of preventative interdisciplinary health care. An annual financial award is made available to a graduate student in Nursing.

Eligibility: Available to current students in the Master of Nursing or Doctor of Philosophy in Nursing programs at Dalhousie.

Application Type: Contact the Department, School, or College for more information

***Margaret Cragg Award***

Family, friends and others interested in assisting in the study of violence against women and/or children established the Margaret Cragg Award. The fund will be used to support one or more annual awards for a graduate student(s) enrolled in the MSW program in the School of Social Work, who is studying in the area of violence against women and/or children, or people living in high risk/disadvantaged environments. The recipients will be individuals who, in the judgment of the MSW Scholarship Committee meet the criteria.

Eligibility: Available to current students in the Master of Social Work program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

***Joan Cummings Memorial Award***

Through a bequest to the University from the late Dr. Cummings, the Joan Cummings Memorial Award was established. Dr. Cummings was a highly respected social work academic, who made significant contributions to dis(Ability) scholarship and practice in human rights, access, and inclusion within the academy and the community. Dr. Cummings identified as a woman with a dis(Ability), and made it her life's work to improve the lives of those with dis(Abilities).

Eligibility: Available to current undergraduate and graduate students enrolled in the School of Social Work, in good academic standing, and who show promise of leadership and service. Preference will be given to a student with a dis(Ability). The recipient will be engaged in dis(Ability) scholarship, evident within the school and community.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: October 15

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Elsevier Canada Award***

This award is given to the student with the second highest cumulative grade point average (GPA) and percentage score throughout the program.

Application Type: Automatic Consideration – No Application Required

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***Eva Mary and Judge Hiram S. Farquhar Bursary***

To provide an annual bursary(s) for one (or more) student(s) enrolled in the Bachelor or Master of Social Work Program at Dalhousie University who demonstrates financial need.

Eligibility: Available to current students in the Bachelor and Master of Social Work programs at Dalhousie, with preference given to a student born in or resident of Hants County, Nova Scotia. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Department, School, or College for more information

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Grainger Award***

This award is given to a second year Master of Science (OT) student who has shown outstanding demonstration of application and integration of theoretical biomedical knowledge with professional therapeutic application.

Application Type: Automatic Consideration – No Application Required

#### ***The Lawrence T. Hancock Scholarship***

Dr. Hancock was the first full time Director of the Maritime School of Social Work and held this position from 1949 until his retirement in 1973.

Contributions were made to this fund by the friends and colleagues of Lawrence Hancock. The funds will be used to provide an annual scholarship to a student in the Master of Social Work program, who achieves high academic standing, and shows promise of leadership and service as exemplified in Dr. Hancock's work. The recipient of the Hancock Scholarship will have demonstrated a high level of academic achievement and the potential for leadership in the field of social work. Applications for the scholarship must be supported by letters of references from the applicant's university, place of employment and any relevant volunteer experience.

Eligibility: Available to current students in the Master of Social Work program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

#### ***Ken Hill Electrotherapy Award***

This award, established by the ERP Group, is in honour of Mr. Ken Hill, retired Professor of Dalhousie University and who also received an honorary Doctorate from the University in 2002. The award is given to the member of the graduating class who demonstrates excellence in electrotherapy.

Application Type: Automatic Consideration – No Application Required

#### ***Alexandra Hirth Award for Excellence in Nursing Research***

This award was established in memory of and in recognition of Alexandra Hirth's commitment to excellence. The award will provide financial support for students in the thesis stream of the Master of Nursing program. The annual award will be made to an outstanding student whose thesis has the potential to contribute to the development of nursing knowledge and whose research is focused on issues related to individuals or families living with chronic illness.

Eligibility: Available to current students in the Master of Nursing or Doctor of Philosophy in Nursing program.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 31

***Margaret Inglis Hagerman Graduate Scholarships in Nursing***

These scholarships are awarded annually to Master of Nursing students who have demonstrated leadership.

Eligibility: Available to current students in the Master of Nursing program.

Application Type: Contact the Department, School, or College for more information

***Phyllis Kennedy Memorial Bursary***

This is awarded to a deserving second year Master of Science (OT) entry level program student who is in good academic standing and who demonstrates an interest in their studies and the school.

Application Type: Automatic Consideration – No Application Required

***Morris B. Kohler Award in Physiotherapy***

This prize is awarded to the student who has demonstrated the greatest interest in the treatment of long-term rehabilitation patients, while attending the Nova Scotia Rehabilitation Centre.

Application Type: Automatic Consideration – No Application Required

***Raoul Leger Memorial Humanitarian Award***

This award was established to honour the memory of Raoul Leger, who received a Master's degree in Social Work from Dalhousie University in 1977. His work at home and abroad exemplified his commitment to community development, peace, and social justice. This award is presented to a graduating BSW or MSW student who is nominated on the basis of achievement with a continued involvement in critical social issues.

Application Type: Automatic Consideration – No Application Required

***Hazel Lloyd Memorial Prize***

The Hazel Lloyd Foundation was established by Miss Aphra Lloyd in memory of her sister, Miss Hazel A. Lloyd (1930-1985), Associate Professor, School of Physiotherapy. Friends, associates and alumni have made additional contributions. The purpose is to foster interest in geriatrics and gerontology, Professor Lloyd's major areas of interest. The Foundation awards an annual prize to the student with the highest standing in Integrated Practice.

Application Type: Automatic Consideration – No Application Required

***Katherine and Robert MacDonald Scholarship***

The scholarship is intended to provide financial assistance to a student who is studying in a non-thesis option of the Master of Nursing program at Dalhousie University and who has demonstrated excellence in clinical nursing practice at the end of the first year of study. The applicant must have a grade point average of 3.6 or greater, have completed a minimum of one credit of nursing clinical courses and demonstrated excellence in nursing practice, and must supply a statement of career goals explaining how the selected graduate program will contribute to excellence in clinical nursing practice.

Eligibility: Available to current students in the Master of Nursing program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 31

***Electa MacLennan Memorial Scholarship***

The scholarship pays tribute to Dr. MacLennan's outstanding contribution to nursing education. Applicants must be a graduate of the School of Nursing, Dalhousie University baccalaureate or Master's program, have a grade point average of 3.66 or greater, clearly state her/his career and educational goals and how the particular program will contribute to their development, be accepted as a full-time student, or have completed three full credits in a recognized School of Nursing, and demonstrate potential for or show active involvement in advancing the nursing profession in Canada.

Eligibility: Available to current students in the Master of Nursing, Doctor of Philosophy in Nursing, or entering a graduate nursing program.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 31

***Hanna G. Matheson Bursaries***

These bursaries are available to students enrolled in the Bachelor of Social Work or Master of Social Work degree programs on the basis of need. The fund is administered by the Registrar's Office.

Eligibility: Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: General Online Bursary Application

Application Deadline to Apply: October 15

***Ruth May Award***

The scholarship recognizes Dr. May's commitment to the education of outpost nurses and nurse practitioners. The award is given annually to one or more nursing students in the nurse practitioner stream in recognition of clinical excellence and professional growth.

Eligibility: Available to current students in the Master of Nursing program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

***Jean McAloney Memorial Prize***

This prize is awarded annually to the student in the graduating class who has demonstrated the highest clinical standing. The prize is sponsored by the College of Physiotherapists of New Brunswick.

Application Type: Automatic Consideration – No Application Required

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***Donna Myers Memorial Award***

This award is given by the Nova Scotia Branch of the Canadian Physiotherapy Association in memory of Donna Myers, one of the founding members of the Physiotherapy Professional Association of Nova Scotia. This award is presented to the student who exemplifies dedication and professionalism by achieving the greatest improvement in overall academic standing who consistently demonstrates professionalism and enthusiasm for physiotherapy. Recipient must be a student CPA member.

Application Type: Automatic Consideration – No Application Required

***NBAOT Awards for Fieldwork***

This award recognizes high achievement on fieldwork performance ratings, quality of application of theoretical knowledge and therapeutic principles in a variety of fieldwork settings in New Brunswick.

Application Type: Automatic Consideration – No Application Required

***New Brunswick Student Professionalism Award***

This award was established to recognize the graduating student who exemplifies professional behaviour and attributes within the academic and clinical settings. It is sponsored by the New Brunswick Physiotherapy Association.

Application Type: Automatic Consideration – No Application Required

***Newfoundland and Labrador Association of Occupational Therapists (NLAOT) Book Prize***

This award is given to a Master of Science (OT) student from Newfoundland with the highest cumulative grade point average (GPA) entering the second year of the standard Master of Science (OT) program sequencing. A student is determined to be from Newfoundland based upon their admission residency.

Application Type: Automatic Consideration – No Application Required

***Newfoundland and Labrador College of Physiotherapy Prize***

This prize is given to the student in the graduating class who has attained the highest academic standing in Musculoskeletal studies.

Application Type: Automatic Consideration – No Application Required

***Newfoundland and Labrador Occupational Therapy Board Prize***

This award is given to the Newfoundland and Labrador student with the highest GPA throughout the standard two-year Master of Science (OT) occupational therapy program.

Application Type: Automatic Consideration – No Application Required

***Newfoundland and Labrador Physiotherapy Association Prize***

This prize is awarded to the member of the graduating class who has attained the highest standing in Neuroscience studies.

Application Type: Automatic Consideration – No Application Required

***Nova Scotia College of Physiotherapists Prize***

This is an annual award given to a graduating student who has demonstrated the greatest degree of leadership within their class. The recipient is chosen by his/her classmates by secret ballot.

Application Type: Automatic Consideration – No Application Required

**NSSOT Student Society Award**

This award recognizes outstanding contribution with the Dalhousie Occupational Therapy Student Society (DOTSS) and involvement with the NSSOT.

Application Type: Automatic Consideration – No Application Required

**Nova Scotia Section of Orthopedic Division, CPA Award**

Established by the Nova Scotia Section of the Orthopedic Division of CPA, this annual award is given to the student in the graduating class with the best overall achievement in all Orthopedics/Musculo-Skeletal components of the Physiotherapy Program. The recipient of this award has demonstrated a consistently high skill level in the practical and clinical components of musculo- skeletal physiotherapy.

Application Type: Automatic Consideration – No Application Required

**Nova Scotia Society of Occupational Therapists (NSSOT) Book Prize**

This award is given to the student who has demonstrated outstanding promotion of class spirit and contribution to extracurricular activities (professional and social) in the School of Occupational Therapy and the community.

Application Type: Automatic Consideration – No Application Required

**School of Nursing PhD Scholarship**

The scholarship is awarded annually to one or more full-time students enrolled in the PhD (Nursing) program who demonstrates potential for and/or shows active involvement in advancing the nursing profession in Canada.

Eligibility: Available to current students in the Doctor of Philosophy program in Nursing at Dalhousie.

Application Type: Contact the Department, School, or College for more information

**Barbara O'Shea Graduate Award (Post-Professional Award)**

This award was established in recognition of contributions made by Barbara O'Shea to the School of Occupational Therapy as founding director and to the profession of occupational therapy. This award will be awarded to one or two full time or part-time students entering the first year of the Post-Professional Master of Science program at Dalhousie University. Selection will be based on the student's scholarly achievement to date and on a combination of contribution to the profession and potential for graduate studies (evidence taken from the Letter of Intent). In selecting, preference will be given to graduates of the Bachelor of Science

Eligibility: Available to students entering first year in the Master of Science - Occupational Therapy program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

**Dalhousie Occupational Therapy Student Involvement Award**

This award is given to a second year Master of Science (OT) student in good academic standing, who is a member of the Dalhousie Occupational Therapy Student Society (DOTSS) and has clearly demonstrated leadership qualities, actively participated in DOTSS and the promotion of School and/or DOTSS spirit.

Eligibility: Available to students entering second year in the Master of Science - Occupational Therapy program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

**The Phi Kappa Pi Joe Ghiz Memorial Award**

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

**Sheila Poole Run for the Rock Award**

This award is given to the student who clearly demonstrates balance among sound academic achievement, professional growth, athletics and community involvement.

Application Type: Automatic Consideration – No Application Required

**The President's Graduate Teaching Assistant Awards**

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

**PEI Occupational Therapy Society Award for Community Occupational Therapy PEI OT Soc and Reg Board Award**

This award is given to the student who shows interest, enthusiasm, sensitivity and advocacy for community practice together with high academic achievement.



Application Type: Automatic Consideration – No Application Required

***Prince Edward Island Physiotherapy Association Prize***

This prize is awarded annually to the student of the graduating class who has the highest academic standing in Human Anatomy.

Application Type: Automatic Consideration – No Application Required

***Cardwell Robinson Award***

This award is given to the student who demonstrates academic achievement, aptitude and interest in courses related to psychiatry and mental health with at least one full-time fieldwork placement in a mental health setting.

Application Type: Automatic Consideration – No Application Required

***Calvin Ruck Scholarship***

This scholarship is for Bachelor of Social Work and Master of Social Work African Nova Scotian students who have demonstrated a desire to improve the social conditions and further the interests of African Nova Scotian/Canadian people and their communities through the study and practice of Social Work. Careful consideration will be given to the purposes and vision of NSAACP and to the qualities of courage, generosity, persistence, and leadership that characterizes Dr. Ruck's life and work.

Eligibility: Available to current Black students in the Bachelor and Master of Social Work programs. Applicants must be residents of Nova Scotia.

Application Type: Contact the Department, School, or College for more information

***Fred Sammons Scholarship (MSc OT Entry level and Post-Professional Awards)***

A Fred Sammons Scholarship will be awarded annually to: i) one full-time student in Year two of the Master of Science (OT) program, who has the highest academic standing in courses related to technology and design elements. ii) one full-time OR part-time qualified occupational therapy clinician who is registered to practice in one of the four Atlantic Provinces, enrolled in the Master of Science (OT - Post-Professional) thesis program. Priority will be given to the student whose proposed research combines excellence in research design, relevance to Atlantic Canada, and interests related to technology and design solutions that promote health well-being and inclusion in everyday living.

Eligibility: Available to current students in the Master of Science - Occupational Therapy program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

***School of Physiotherapy and CPA Pediatric Division***

This award is given by the School of Physiotherapy and CPA Pediatric Division to recognize a graduating student who has shown a keen interest in pediatrics physiotherapy. The recipient is selected chosen based on both academic and practical excellence in the pediatric portions of the physiotherapy program.

Application Type: Automatic Consideration – No Application Required

***The School of Social Work MSW Alumni Scholarship***

This alumni scholarship has been established to support financial awards given to a student in the Master of Social Work degree program who demonstrates the highest values of humanity, community, and service in the study of social work as reflected in contributions to the learning environment of the school. A student must be nominated for this scholarship.

Application Type: Automatic Consideration – No Application Required

***The Patricia Stanfield Covert Award in Physiotherapy***

An endowment has been established to provide an annual prize to a physiotherapy student who is entering the final year of the program. The recipient is to be nominated by classmates on the basis of extracurricular activities, interpersonal skills, and scholarship proficiency.

Application Type: Automatic Consideration – No Application Required

***Student Research Award***

This award is given annually by the School of Physiotherapy. It recognizes student research efforts and is presented to the research group who achieves the highest evaluation on their podium presentation at the School of Physiotherapy Annual Research Day.

Application Type: Automatic Consideration – No Application Required

***Anna Trenholm Memorial Prize***

The prize is awarded to one or more graduates of the nurse practitioner program who in the judgment of the faculty shows the most promise for contributing to the health of a disadvantaged Canadian community.

Application Type: Automatic Consideration – No Application Required

***Unsung Hero Award***

This award is given to the graduating student who has generously contributed her/ his time and efforts to School activities and has demonstrated a positive and enthusiastic school spirit.

#### ***Helen Watson Memorial Scholarship***

The scholarship is awarded annually to a full-time student enrolled in the PhD in Nursing program who demonstrates potential for or shows active involvement in advancing the nursing profession in Canada. Applicants must normally have a grade point average of 3.66 in their previous work (baccalaureate or masters). Their letter of application will outline their contribution to nursing leadership and how their research will improve health outcomes and influence health and social policy.

Eligibility: Available to current students in the Doctor of Philosophy program in Nursing at Dalhousie.

Application Type: Contact the Department, School, or College for more information

#### ***Sonja R. Weil Memorial Bursary***

Family and friends established this endowment in memory of Sonja Weil and in tribute to her work as a social worker and psychotherapist. This bursary is open to students in the Bachelor of Social Work and Master of Social Work programs, although first priority is given to graduate students who demonstrate financial need, satisfactory academic standing, and interest in those areas which most closely reflect Sonja Weil's work in child and family therapy.

Eligibility: Available to current students in the Bachelor and Master of Social Work programs at Dalhousie, with preference given to graduate students.

Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: October 15

## **Health Sciences**

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Nursing**

#### ***Margaret Cragg Award***

This award was established by the family and friends in honour of Margaret M. Cragg, who pioneered the movement against violence toward women and in the practice of preventative interdisciplinary health care. An annual financial award is made available to a graduate student in Nursing.

Eligibility: Available to current students in the Master of Nursing or Doctor of Philosophy in Nursing programs at Dalhousie.

Application Type: Contact the Department, School, or College for more information

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student

Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Alexandra Hirth Award for Excellence in Nursing Research***

This award was established in memory of and in recognition of Alexandra Hirth’s commitment to excellence. The award will provide financial support for students in the thesis stream of the Master of Nursing program. The annual award will be made to an outstanding student whose thesis has the potential to contribute to the development of nursing knowledge and whose research is focused on issues related to individuals or families living with chronic illness.

Eligibility: Available to current students in the Master of Nursing or Doctor of Philosophy in Nursing program.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 31

#### ***Margaret Inglis Hagerman Graduate Scholarships in Nursing***

These scholarships are awarded annually to Master of Nursing students who have demonstrated leadership.

Eligibility: Available to current students in the Master of Nursing program.

Application Type: Contact the Department, School, or College for more information

#### ***Katherine and Robert MacDonald Scholarship***

The scholarship is intended to provide financial assistance to a student who is studying in a non-thesis option of the Master of Nursing program at Dalhousie University and who has demonstrated excellence in clinical nursing practice at the end of the first year of study. The applicant must have a grade point average of 3.6 or greater, have completed a minimum of one credit of nursing clinical courses and demonstrated excellence in nursing practice, and must supply a statement of career goals explaining how the selected graduate program will contribute to excellence in clinical nursing practice.

Eligibility: Available to current students in the Master of Nursing program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 31

#### ***Electa MacLennan Memorial Scholarship***

The scholarship pays tribute to Dr. MacLennan’s outstanding contribution to nursing education. Applicants must be a graduate of the School of Nursing, Dalhousie University baccalaureate or Master’s program, have a grade point average of 3.66 or greater, clearly state her/his career and educational goals and how the particular program will contribute to their development, be accepted as a full-time student, or have completed three full credits in a recognized School of Nursing, and demonstrate potential for or show active involvement in advancing the nursing profession in Canada.

Eligibility: Available to current students in the Master of Nursing, Doctor of Philosophy in Nursing, or entering a graduate nursing program.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 31

#### ***Ruth May Award***

The scholarship recognizes Dr. May’s commitment to the education of outpost nurses and nurse practitioners. The award is given annually to one or more nursing students in the nurse practitioner stream in recognition of clinical excellence and professional growth.

Eligibility: Available to current students in the Master of Nursing program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

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The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of

Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***School of Nursing PhD Scholarship***

The scholarship is awarded annually to one or more full-time students enrolled in the PhD (Nursing) program who demonstrates potential for and/or shows active involvement in advancing the nursing profession in Canada.

Eligibility: Available to current students in the Doctor of Philosophy program in Nursing at Dalhousie.

Application Type: Contact the Department, School, or College for more information

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***Anna Trenholm Memorial Prize***

The prize is awarded to one or more graduates of the nurse practitioner program who in the judgment of the faculty shows the most promise for contributing to the health of a disadvantaged Canadian community.

Application Type: Automatic Consideration – No Application Required

#### ***Helen Watson Memorial Scholarship***

The scholarship is awarded annually to a full-time student enrolled in the PhD in Nursing program who demonstrates potential for or shows active involvement in advancing the nursing profession in Canada. Applicants must normally have a grade point average of 3.66 in their previous work (baccalaureate or masters). Their letter of application will outline their contribution to nursing leadership and how their research will improve health outcomes and influence health and social policy.

Eligibility: Available to current students in the Doctor of Philosophy program in Nursing at Dalhousie.

Application Type: Contact the Department, School, or College for more information

## **Human Communication Disorders**

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor

Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

## **Occupational Therapy**

#### ***Elizabeth Bell Scholarship MSc (OT) Entry level and Post-Professional Awards***

The Elizabeth Bell Scholarship supports the rapid expansion of occupational therapy knowledge development and knowledge transfer through entry level, post-professional, and PhD studies. In the Entry-level program, the award will be given to a student who has achieved excellent evaluations in all fieldwork courses. Occupational therapists in the post-professional masters who achieve a grade of A or higher in their practicum course are eligible for this award. Occupational therapists in a Dalhousie PhD program are eligible for consideration based on their PhD application Statement of Interest.

Application Type: Automatic Consideration – No Application Required

#### ***CAOT Student Award***

This award is given to the student who has achieved the highest academic standing in occupational therapy theory courses.

Application Type: Automatic Consideration – No Application Required

#### ***Elsevier Canada Award***

This award is given to the student with the second highest cumulative grade point average (GPA) and percentage score throughout the program.

Application Type: Automatic Consideration – No Application Required

***Grainger Award***

This award is given to a second year Master of Science (OT) student who has shown outstanding demonstration of application and integration of theoretical biomedical knowledge with professional therapeutic application.

Application Type: Automatic Consideration – No Application Required

***Phyllis Kennedy Memorial Bursary***

This is awarded to a deserving second year Master of Science (OT) entry level program student who is in good academic standing and who demonstrates an interest in their studies and the school.

Application Type: Automatic Consideration – No Application Required

***NBAOT Awards for Fieldwork***

This award recognizes high achievement on fieldwork performance ratings, quality of application of theoretical knowledge and therapeutic principles in a variety of fieldwork settings in New Brunswick.

Application Type: Automatic Consideration – No Application Required

***Newfoundland and Labrador Association of Occupational Therapists (NLAOT) Book Prize***

This award is given to a Master of Science (OT) student from Newfoundland with the highest cumulative grade point average (GPA) entering the second year of the standard Master of Science (OT) program sequencing. A student is determined to be from Newfoundland based upon their admission residency.

Application Type: Automatic Consideration – No Application Required

***Newfoundland and Labrador Occupational Therapy Board Prize***

This award is given to the Newfoundland and Labrador student with the highest GPA throughout the standard two year Master of Science (OT) occupational therapy program.

Application Type: Automatic Consideration – No Application Required

***NSSOT Student Society Award***

This award recognizes outstanding contribution with the Dalhousie Occupational Therapy Student Society (DOTSS) and involvement with the NSSOT.

Application Type: Automatic Consideration – No Application Required

***Nova Scotia Society of Occupational Therapists (NSSOT) Book Prize***

This award is given to the student who has demonstrated outstanding promotion of class spirit and contribution to extracurricular activities (professional and social) in the School of Occupational Therapy and the community.

Application Type: Automatic Consideration – No Application Required

***Barbara O'Shea Graduate Award (Post-Professional Award)***

This award was established in recognition of contributions made by Barbara O'Shea to the School of Occupational Therapy as founding director and to the profession of occupational therapy. This award will be awarded to one or two full time or part-time students entering the first year of the Post-Professional Master of Science program at Dalhousie University. Selection will be based on the student's scholarly achievement to date and on a combination of contribution to the profession and potential for graduate studies (evidence taken from the Letter of Intent). In selecting, preference will be given to graduates of the Bachelor of Science

Eligibility: Available to students entering first year in the Master of Science - Occupational Therapy program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

***Dalhousie Occupational Therapy Student Involvement Award***

This award is given to a second year Master of Science (OT) student in good academic standing, who is a member of the Dalhousie Occupational Therapy Student Society (DOTSS) and has clearly demonstrated leadership qualities, actively participated in DOTSS and the promotion of School and/or DOTSS spirit.

Eligibility: Available to students entering second year in the Master of Science - Occupational Therapy program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

***Sheila Poole Run for the Rock Award***

This award is given to the student who clearly demonstrates balance among sound academic achievement, professional growth, athletics, and community involvement.

Application Type: Automatic Consideration – No Application Required

***PEI Occupational Therapy Society Award for Community Occupational Therapy PEI OT Soc and Reg Board Award***

This award is given to the student who shows interest, enthusiasm, sensitivity, and advocacy for community practice together with high academic achievement.

Application Type: Automatic Consideration – No Application Required

#### ***Cardwell Robinson Award***

This award is given to the student who demonstrates academic achievement, aptitude and interest in courses related to psychiatry and mental health with at least one full-time fieldwork placement in a mental health setting.

Application Type: Automatic Consideration – No Application Required

#### ***Fred Sammons Scholarship (MSc OT Entry level and Post-Professional Awards)***

A Fred Sammons Scholarship will be awarded annually to: i) one full-time student in Year two of the Master of Science (OT) program, who has the highest academic standing in courses related to technology and design elements. ii) one full-time OR part-time qualified occupational therapy clinician who is registered to practice in one of the four Atlantic Provinces, enrolled in the Master of Science (OT - Post-Professional) thesis program. Priority will be given to the student whose proposed research combines excellence in research design, relevance to Atlantic Canada, and interests related to technology and design solutions that promote health well-being and inclusion in everyday living.

Eligibility: Available to current students in the Master of Science - Occupational Therapy program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

## **Pharmacy**

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.



Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Physiotherapy**

#### ***Canadian Physiotherapy Association Award***

A certificate and first year membership in the Canadian Physiotherapy Association constitute this annual award. It is presented to the student who has achieved the highest aggregate percentage in academic and clinical physiotherapy education.

Application Type: Automatic Consideration – No Application Required

#### ***Canadian Physiotherapy Cardio-Respiratory/CPA Student Excellence Award***

This award is given at convocation in recognition of outstanding achievement in cardio-respiratory physiotherapy.

Application Type: Automatic Consideration – No Application Required

#### ***Cardio-Respiratory Award***

This award initiated by an anonymous donor recognizes excellence in cardiorespiratory physiotherapy. It is awarded to the student who achieves the highest academic and clinical standing in all components of cardiorespiratory physiotherapy.

Application Type: Automatic Consideration – No Application Required

#### ***Ken Hill Electrotherapy Award***

This award, established by the ERP Group, is in honour of Mr. Ken Hill, retired Professor of Dalhousie University and who also received an honorary Doctorate from the University in 2002. The award is given to the member of the graduating class who demonstrates excellence in electrotherapy.

Application Type: Automatic Consideration – No Application Required

#### ***Morris B. Kohler Award in Physiotherapy***

This prize is awarded to the student who has demonstrated the greatest interest in the treatment of long-term rehabilitation patients, while attending the Nova Scotia Rehabilitation Centre.

Application Type: Automatic Consideration – No Application Required

#### ***Hazel Lloyd Memorial Prize***

The Hazel Lloyd Foundation was established by Miss Aphra Lloyd in memory of her sister, Miss Hazel A. Lloyd (1930-1985), Associate Professor, School of Physiotherapy. Friends, associates and alumni have made additional contributions. The purpose is to foster interest in geriatrics and gerontology, Professor Lloyd's major areas of interest. The Foundation awards an annual prize to the student with the highest standing in Integrated Practice.

Application Type: Automatic Consideration – No Application Required

***Jean McAloney Memorial Prize***

This prize is awarded annually to the student in the graduating class who has demonstrated the highest clinical standing. The prize is sponsored by the College of Physiotherapists of New Brunswick.

Application Type: Automatic Consideration – No Application Required

***Donna Myers Memorial Award***

This award is given by the Nova Scotia Branch of the Canadian Physiotherapy Association in memory of Donna Myers, one of the founding members of the Physiotherapy Professional Association of Nova Scotia. This award is presented to the student who exemplifies dedication and professionalism by achieving the greatest improvement in overall academic standing who consistently demonstrates professionalism and enthusiasm for physiotherapy. Recipient must be a student CPA member.

Application Type: Automatic Consideration – No Application Required

***New Brunswick Student Professionalism Award***

This award was established to recognize the graduating student who exemplifies professional behaviour and attributes within the academic and clinical settings. It is sponsored by the New Brunswick Physiotherapy Association.

Application Type: Automatic Consideration – No Application Required

***Newfoundland and Labrador College of Physiotherapy Prize***

This prize is given to the student in the graduating class who has attained the highest academic standing in Musculoskeletal studies.

Application Type: Automatic Consideration – No Application Required

***Newfoundland and Labrador Physiotherapy Association Prize***

This prize is awarded to the member of the graduating class who has attained the highest standing in Neuroscience studies.

Application Type: Automatic Consideration – No Application Required

***Nova Scotia College of Physiotherapists Prize***

This is an annual award given to a graduating student who has demonstrated the greatest degree of leadership within their class. The recipient is chosen by his/her classmates by secret ballot.

Application Type: Automatic Consideration – No Application Required

***Nova Scotia Section of Orthopedic Division, CPA Award***

Established by the Nova Scotia Section of the Orthopedic Division of CPA, this annual award is given to the student in the graduating class with the best overall achievement in all Orthopedics/Musculo-Skeletal components of the Physiotherapy Program. The recipient of this award has demonstrated a consistently high skill level in the practical and clinical components of musculo- skeletal physiotherapy.

Application Type: Automatic Consideration – No Application Required

***Prince Edward Island Physiotherapy Association Prize***

This prize is awarded annually to the student of the graduating class who has the highest academic standing in Human Anatomy.

Application Type: Automatic Consideration – No Application Required

***School of Physiotherapy and CPA Pediatric Division***

This award is given by the School of Physiotherapy and CPA Pediatric Division to recognize a graduating student who has shown a keen interest in pediatrics physiotherapy. The recipient is selected chosen based on both academic and practical excellence in the pediatric portions of the physiotherapy program.

Application Type: Automatic Consideration – No Application Required

***The Patricia Stanfield Covert Award in Physiotherapy***

An endowment has been established to provide an annual prize to a physiotherapy student who is entering the final year of the program. The recipient is to be nominated by classmates on the basis of extracurricular activities, interpersonal skills and scholarship proficiency.

Application Type: Automatic Consideration – No Application Required

***Student Research Award***

This award is given annually by the School of Physiotherapy. It recognizes student research efforts and is presented to the research group who achieves the highest evaluation on their podium presentation at the School of Physiotherapy Annual Research Day.

Application Type: Automatic Consideration – No Application Required

***Unsung Hero Award***

This award is given to the graduating student who has generously contributed her/ his time and efforts to School activities and has demonstrated a positive

and enthusiastic school spirit.

Application Type: Automatic Consideration – No Application Required

## Social Work

### ***Association of Black Social Workers Bursary***

The Association of Black Social Workers (ABSW) is a volunteer charitable organization consisting of Black Social Workers and Human Service Workers throughout the Province. ABSW offers a bursary to assist full and part time African Canadian students who are attending a recognized university and who are studying towards a social work degree. The applicant must apply in writing to the Chairperson of the Bursary Committee annually before October 15th. The application should be accompanied by a cover letter, demonstrating your need for this bursary; a complete resume, outlining the applicant's paid and unpaid work in the social field; and two letters of reference, one academic and one work or community related. Each reference should speak to the applicant's suitability to the social work field.

Eligibility: Priority will be given to those who are actively involved with the Association of Black Social Workers.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: October 15

### ***Margaret Cragg Award***

Family, friends and others interested in assisting in the study of violence against women and/or children established the Margaret Cragg Award. The fund will be used to support one or more annual awards for a graduate student(s) enrolled in the MSW program in the School of Social Work, who is studying in the area of violence against women and/or children, or people living in high risk/disadvantaged environments. The recipients will be individuals who, in the judgment of the MSW Scholarship Committee meet the criteria.

Eligibility: Available to current students in the Master of Social Work program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

### ***Joan Cummings Memorial Award***

Through a bequest to the University from the late Dr. Cummings, the Joan Cummings Memorial Award was established. Dr. Cummings was a highly respected social work academic, who made significant contributions to dis(Ability) scholarship and practice in human rights, access, and inclusion within the academy and the community. Dr. Cummings identified as a woman with a dis(Ability) and made it her life's work to improve the lives of those with dis(Abilities).

Eligibility: Available to current undergraduate and graduate students enrolled in the School of Social Work, in good academic standing, and who show promise of leadership and service. Preference will be given to a student with a dis(Ability). The recipient will be engaged in dis(Ability) scholarship, evident within the school and community.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: October 15

### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***Eva Mary and Judge Hiram S. Farquhar Bursary***

To provide an annual bursary(s) for one (or more) student(s) enrolled in the Bachelor or Master of Social Work Program at Dalhousie University who demonstrates financial need.

Eligibility: Available to current students in the Bachelor and Master of Social Work programs at Dalhousie, with preference given to a student born in or resident of Hants County, Nova Scotia. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Department, School, or College for more information

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***The Lawrence T. Hancock Scholarship***

Dr. Hancock was the first full time Director of the Maritime School of Social Work and held this position from 1949 until his retirement in 1973.

Contributions were made to this fund by the friends and colleagues of Lawrence Hancock. The funds will be used to provide an annual scholarship to a student in the Master of Social Work program, who achieves high academic standing, and shows promise of leadership and service as exemplified in Dr. Hancock’s work. The recipient of the Hancock Scholarship will have demonstrated a high level of academic achievement and the potential for leadership in the field of social work. Applications for the scholarship must be supported by letters of references from the applicant’s university, place of employment and any relevant volunteer experience.

Eligibility: Available to current students in the Master of Social Work program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

***Raoul Leger Memorial Humanitarian Award***

This award was established to honour the memory of Raoul Leger, who received a Master’s degree in Social Work from Dalhousie University in 1977. His work at home and abroad exemplified his commitment to community development, peace, and social justice. This award is presented to a graduating BSW or MSW student who is nominated on the basis of achievement with a continued involvement in critical social issues.

Application Type: Automatic Consideration – No Application Required

***Hanna G. Matheson Bursaries***

These bursaries are available to students enrolled in the Bachelor of Social Work or Master of Social Work degree programs on the basis of need. The fund is administered by the Registrar's Office.

Eligibility: Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: General Online Bursary Application

Application Deadline to Apply: October 15

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master’s or Doctoral level, in any discipline at Dalhousie University. The student must have a

first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***Calvin Ruck Scholarship***

This scholarship is for Bachelor of Social Work and Master of Social Work African Nova Scotian students who have demonstrated a desire to improve the social conditions and further the interests of African Nova Scotian/Canadian people and their communities through the study and practice of Social Work. Careful consideration will be given to the purposes and vision of NSAACP and to the qualities of courage, generosity, persistence, and leadership that characterizes Dr. Ruck's life and work.

Eligibility: Available to current Black students in the Bachelor and Master of Social Work programs. Applicants must be residents of Nova Scotia.

Application Type: Contact the Department, School, or College for more information

#### ***The School of Social Work MSW Alumni Scholarship***

This alumni scholarship has been established to support financial awards given to a student in the Master of Social Work degree program who demonstrates the highest values of humanity, community, and service in the study of social work as reflected in contributions to the learning environment of the school. A student must be nominated for this scholarship.

Application Type: Automatic Consideration – No Application Required

#### ***Sonja R. Weil Memorial Bursary***

Family and friends established this endowment in memory of Sonja Weil and in tribute to her work as a social worker and psychotherapist. This bursary is open to students in the Bachelor of Social Work and Master of Social Work programs, although first priority is given to graduate students who demonstrate financial need, satisfactory academic standing, and interest in those areas which most closely reflect Sonja Weil's work in child and family therapy.

Eligibility: Available to current students in the Bachelor and Master of Social Work programs at Dalhousie, with preference given to graduate students.

Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: October 15

## **Schulich School of Law**

### **Introduction**

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## **All Schulich School of Law Awards**

#### ***George Caines Graduate Scholarship in Law***

Approximately \$20,000 (total) awarded to one of more students each year. This scholarship was established by John Bragg in recognition of George Caines' service to John Bragg, his family, and the Bragg Group of Companies as a trusted legal advisor over a long period of time.

Eligibility: First consideration given to applicants with a focus on business or tax law, but second consideration will be given to those students who, while qualified to pursue their graduate studies, have demonstrated financial need.

Application Type: Automatic Consideration – No Application Required

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***J. Fielding Sherwood Memorial Bursary Fund***

The fund provides a bursary which is to be awarded to an LLM or PhD student whose work concerns the environment or relates in some way to fisheries or ocean research studies. The intent is that the bursary be directed toward travel or research. The student will be selected by the Associate Dean Graduate Studies, on the advice of the Graduate Studies Committee. The annual amount is to be determined by him/her. One award may be made annually. The fund will be self-perpetuating.

Eligibility: Available to students in the Master of Laws program at Dalhousie University, with preference given to Dalhousie LLB or JD graduates. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty for more information

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Roy A. Jodrey Scholarship in Law***

The will of the late Roy A. Jodrey established a fund, the income of which is to be awarded as an annual scholarship, for post-graduate study at Schulich School of Law to a student deemed by the school to be outstanding.

Eligibility: Available to students in the Master of Laws and Doctor of Philosophy in Law programs.

Application Type: Contact the Faculty for more information

#### ***Law Foundation of Nova Scotia Millennium Graduate Fellowship Fund***

The Law Foundation of Nova Scotia established the Graduate Millennium Scholarship in the year 2000 to provide one or more fellowships and research support to law students at the master's or doctoral level.

Application Type: Contact the Faculty for more information

Value: \$20,000

#### ***Dean Ronald St. John Macdonald Fellowship in Law***

Awarded on the basis of academic merit and financial need to a student entering the LLM program and concentrating in one of both of the fields of International Law or Human Rights Law. The student may be either a Canadian or non-Canadian citizen. This fellowship is in honour of the late Ronald St. John Macdonald, former Dean of the Law School and Judge of the European Court of Human Rights, who was instrumental in developing the graduate studies program at the Law School.

Eligibility: Available to current students in the Master of Laws program.

Application Type: Contact the Faculty for more information

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

### ***Schulich Scholarships in Law***

The fund provides annual scholarships to LL.M. and Ph.D. students.

Eligibility: Available to students in the Master of Laws and Doctor of Philosophy in Law programs who meet two of the following three criteria: (a) academic merit, (b) community service, and (c) financial need.

Application Type: Contact the Faculty for more information

Value: 1 @ \$20,000 and 2 @ \$10,000

### ***George C. Thompson Fellowship in Law***

Mr. George C. Thompson established a fund to provide a graduate fellowship for a student enrolled in the Master of Laws program at Dalhousie. The fellowship should preferably be awarded to an LL.B. or J.D. graduate from Dalhousie with preference given to students who combine scholarly achievement and athletic involvement throughout the candidate's university career.

Eligibility: Available to students in the Master of Laws program, with preference given to Dalhousie LL.B. or J.D. graduates.

Application Type: Contact the Faculty for more information

### ***The H. A. J. Wedderburn Scholarship in Law***

The fund provides an annual scholarship to a Black Nova Scotian enrolled in a graduate program (LL.M. or Ph.D.) in the Schulich School of Law, Dalhousie University. This scholarship was established by the Nova Scotia Association for the Advancement of Coloured People in recognition of Mr. Wedderburn's contributions in the struggles of Black peoples of Nova Scotia for equal access.

Eligibility: Available to Black students in the Master of Laws program, with preference given to Dalhousie LL.B. or J.D. graduates.

Application Type: Contact the Faculty for more information

## **Faculty of Management**

### **Introduction**

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## **All Faculty of Management Awards**

### ***Alberta Letts Conference Travel Award***

Past Provincial Librarian, and Past President of CLA (1957/1958), Alberta Letts was a strong supporter of the foundation of the school and was very engaged during its early years. After her untimely death in 1973, Dalhousie University recognized Ms. Letts' contribution by establishing the Alberta Letts Conference Travel Award to enable MLIS student travel for conference participation. A maximum of two student awards of \$500 each will be awarded twice a year.

Effective beginning 18/19 calendar year.

Eligibility: Open to MLIS students (full-time or part-time, returning and graduating) whose paper or poster has been accepted for presentation at a conference.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: November 1 & April 1

### ***AMSI Bursary***

Funded by AMSI, these bursaries aim to provide assistance to MLIS students (incoming or returning) with good academic standing and proven financial need.

Eligibility: Candidates must be incoming or returning MLIS students in good academic standing with demonstrated financial need.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: August 15th

### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as

having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.  
Application Type: Contact awards@dal.ca for more information  
Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Dover Mills Fellowship in International Business***

The Dover Mills Fellowship in International Business was created with a generous endowed gift to Dalhousie's Capital Ideas Campaign by Dover Mills Limited. The \$5,000 fellowship is available to three full-time Atlantic Canadian students entering the final year of MBA studies, who are specializing in international business. Fellowship recipients will be selected on the basis of a career interest in international business and academic performance to date.

Application Type: Automatic Consideration – No Application Required

Value: \$5,000

***Stephanie Downs Memorial Award***

Created in memory of Stephanie Downs (MLIS 2006). Stephanie demonstrated exemplary qualities for information professionals, notably: critical leadership abilities, superlative interpersonal skills, a strong interest in international perspectives, and a deep commitment to service.

Eligibility: Candidates must be part-time or full-time returning MLIS students with a demonstrated commitment to leadership and to student life at SIM.

Candidates must have volunteered or studied in an international environment outside their home country.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 1

***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***Goldberg-Schulich Award for Entrepreneurship***

The Nevada Capital Corporation in 1984 donated the sum of \$29,000 to establish an award in memory of Meyer Goldberg of Halifax, Nova Scotia. This award is available to a student entering the second year of Dalhousie University's MBA Program.

Eligibility: Available to current second year students in the Master of Business Administration program at Dalhousie.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: March 15

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.



Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Dalhousie-Horrocks National Leadership Award***

The Dalhousie-Horrocks National Leadership Award provides support to incoming or returning graduate students who demonstrate leadership potential in information management, specifically in libraries. The award will be presented at the annual Dalhousie-Horrocks National Leadership Lecture.

Eligibility: Candidates must be incoming or returning MLIS students with an A- average (3.70 GPA). Candidates must be registered for fall and winter courses by May 1 and show leadership potential in the field of information management in libraries.

Application Type: Automatic Consideration – No Application Required

Application Deadline to Apply: May 1

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***Norman Newman Family Business Award***

This scholarship is offered as a tribute to Mr. Newman's record of leadership in business and the community. For students beyond first year in the Commerce program, Management program, or in the MBA program, a competition involving a case study of a family business is the basis of awarding of the scholarship, with a first and second place winner. Application required through the Centre for Family Business and Regional Prosperity.

Eligibility: Available to current students in the Bachelor of Commerce, Bachelor of Management, or Master of Business Administration programs at Dalhousie.

Application Type: Contact the Department, School, or College for more information

#### ***NORTHSTAR Trade Finance - Mary Grover LeBlanc Memorial Fellowship - International Business***

The Northstar Trade Finance-Mary Grover LeBlanc Memorial Fellowship in International Business was created by Scott Shepherd (MBA 1983). The \$3,000 fellowship is available to two students studying International Business. Candidates must be Canadian citizens or permanent residents of Canada and have a strong academic record to date.

Eligibility: Available to current students majoring in International Business in the Master of Business Administration program at Dalhousie. Applicants must be Canadian citizens or permanent residents of Canada.

Application Type: Contact the Department, School, or College for more information

Value: \$3,000

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Business Administration**

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary

applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The President's Graduate Teaching Assistant Awards***

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Application Type: Contact the Department, School, or College for more information

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

## **Information Management**

#### ***Alberta Letts Conference Travel Award***

Past Provincial Librarian, and Past President of CLA (1957/1958), Alberta Letts was a strong supporter of the foundation of the school and was very engaged during its early years. After her untimely death in 1973, Dalhousie University recognized Ms. Letts' contribution by establishing the Alberta Letts Conference Travel Award to enable MLIS student travel for conference participation. A maximum of two student awards of \$500 each will be awarded twice a year.

Effective beginning 18/19 calendar year.

Eligibility: Open to MLIS students (full-time or part-time, returning and graduating) whose paper or poster has been accepted for presentation at a

conference.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: November 1 & April 1

#### ***AMSI Bursary***

Funded by AMSI, these bursaries aim to provide assistance to MLIS students (incoming or returning) with good academic standing and proven financial need.

Eligibility: Candidates must be incoming or returning MLIS students in good academic standing with demonstrated financial need.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: August 15th

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***Stephanie Downs Memorial Award***

Created in memory of Stephanie Downs (MLIS 2006). Stephanie demonstrated exemplary qualities for information professionals, notably: critical leadership abilities, superlative interpersonal skills, a strong interest in international perspectives, and a deep commitment to service.

Eligibility: Candidates must be part-time or full-time returning MLIS students with a demonstrated commitment to leadership and to student life at SIM.

Candidates must have volunteered or studied in an international environment outside their home country.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: May 1

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Dalhousie-Horrocks National Leadership Award***

The Dalhousie-Horrocks National Leadership Award provides support to incoming or returning graduate students who demonstrate leadership potential in information management, specifically in libraries. The award will be presented at the annual Dalhousie-Horrocks National Leadership Lecture.

Eligibility: Candidates must be incoming or returning MLIS students with an A- average (3.70 GPA). Candidates must be registered for fall and winter courses by May 1 and show leadership potential in the field of information management in libraries.

Application Type: Automatic Consideration – No Application Required

Application Deadline to Apply: May 1

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Public Administration**

#### ***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

## **Resource and Environmental Studies**

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

## **Faculty of Science**

### **Introduction**

*This Calendar is prepared some months before the year for which it is intended to provide guidance. The policies, procedures, and awards listed in this section are subject to continuing review and revision. Not all awards listed will be offered in any given year. Additionally, the number of awards offered, values of awards, and selection criteria may change without notice.*

## **All Faculty of Science Awards**

#### ***Donald R. Arnold Scholarship***

The Donald R. Arnold Scholarship is awarded to the student with overall excellence in chemistry, especially in the field of organic photochemistry, and who has demonstrated exceptional aptitude for research.

Application Type: Automatic Consideration – No Application Required

#### ***The Beatrice Award: Clinical Student Citizenship***

The Clinical Citizenship Award will be awarded annually to the graduate student in the Clinical Psychology PhD Program who is deemed to have been the “best citizen” and the most positively helpful or supportive to fellow students (graduate or undergraduate) during their time in the Program. The award will be decided on by a committee of students and others chosen and headed by the Clinical Program Co-ordinator. The award is to honour the outstanding contributions of Beatrice Hanisch to the Clinical Psychology PhD Program since its inception in 1989.

Application Type: Automatic Consideration – No Application Required

#### ***Robert L. Comeau Scholarship***

This scholarship honours the memory of Dr. Robert L. Comeau by providing scholarships to one or more students studying in the Department of Economics. Dr. Comeau was a member of Dalhousie's Economics Department for 27 years, retiring in 1990. He served as Chair from 1978 to 1983. He was a dedicated teacher and had long-standing concern for the financial needs of students. Applicants must have attained a first-class standing in their university economics studies to date. The financial need to applicants will be taken into consideration by the Selection Committee. Applicants must be graduate students. Students may apply directly by submitting a signed letter to the chairperson of the Economics Department or may be nominated by the Graduate Coordinator in the Department.

Eligibility: Available to current graduate students in Economics at Dalhousie University.  
Application Type: Contact the Department, School, or College for more information  
Application Deadline to Apply: January 15

***Dr. Jean Cooley Graduate Fellowship in Analytical Chemistry***

The Cooley Fellowship provides an annual award for a female graduate student in Chemistry, who is participating in an analytical chemistry project in any division of chemistry.

Eligibility: Open to female graduate students enrolled in the MSc or PhD program, with a preference to candidates from the Maritime Provinces.

Application Type: Automatic Consideration – No Application Required

Value: \$1,000

***The Belle Crowe Scholarship***

The Scholarship was established in 1944 in accordance with a gift from the estate of Miss Belle Chisholm Crowe, a student at Dalhousie University in 1885/86. This scholarship is awarded to a deserving student upon his or her graduation from Dalhousie University to enable such students to pursue postgraduate study in Inorganic Chemistry.

Application Type: Contact the Department, School, or College for more information

***Zella Crowe Spencer Memorial Scholarship***

The Zella Crowe Spencer Memorial Scholarship is an annual award that will be used to “top-up” a regular Dalhousie Scholarship award going to a new or continuing female graduate student in economics. Candidates must have first-class standing in their university economics studies to date. It is open to students already in or applying to any graduate program offered by the Department of Economics.

Application Type: Automatic Consideration – No Application Required

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

***Gerry Dauphinee Graduate Scholarship in Chemistry***

The award recognizes the contribution of Professor Dauphinee to the Department of Chemistry at Dalhousie University. This scholarship rewards a graduate student in chemistry who has shown excellence in research and in teaching.

Application Type: Automatic Consideration – No Application Required

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***The Professor Michael Edelstein Memorial Graduate Prize***

Dr. Edelstein was an outstanding Professor in the Department of Mathematics and Statistics from 1964 to 1982. He was instrumental in the transformation of the department to the research department it is now, with a strong graduate component. A fund was established by his family to provide an annual prize to be awarded to a graduate student who shows great promise in the mathematical sciences. In order to encourage mathematical talent in both genders, the prize will alternate between male and female recipients.

Application Type: Automatic Consideration – No Application Required

***The Kathy Ellis Memorial Book Prize***

This prize was established through the support of Kathy’s friends and colleagues who expressed the wish she be remembered and agreed that a fitting manner would be through the award of an annual book prize in Oceanography, given in her name. Kathy had a deep commitment to the principles of high-quality scientific research and the communication of this knowledge to students and professionals in developing nations. This prize is presented annually to the Department of Oceanography graduate student, in their first year, who achieves the highest average in the Oceanography core courses.

Application Type: Automatic Consideration – No Application Required

***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie’s Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or

other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The Dr. Mabel E. Goudge Scholarship in Psychology***

In her Will, the late Dr. Mabel Goudge bequeathed a sum of money to endow a scholarship for the most outstanding woman graduate student in experimental or clinical psychology.

Eligibility: Available to current female graduate students in Experimental or Clinical Psychology at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Heller-Smith Foundation Graduate Scholarship in Mathematics and Statistics***

The Scholarship was established to provide financial support and recognition to a graduate student. This scholarship will be awarded annually on the basis of academic achievement as determined by the faculty committee in the department of Mathematics and Statistics.

Application Type: Automatic Consideration – No Application Required

#### ***The Douglas M. Johnston MASC Scholarship in Marine Affairs***

This is an annual scholarship in the amount of \$5,000 established by the Maritime Awards Society of Canada (MASC) for a Canadian citizen to pursue the Master of Marine Management (MMM) degree. The criteria for conferral of the scholarship include the following: applicants must be Canadian citizens; must demonstrate superior academic records; and may undergo a financial needs assessment. Qualified applicants to the MMM are automatically considered for this scholarship upon completion of their application; no separate application is necessary.

Application Type: Automatic Consideration – No Application Required

Value: \$5,000

#### ***Professor George A. B. Kartsaklis Memorial Scholarship***

Family, friends, and colleagues of Professor Kartsaklis established this fund to provide financial assistance to one or more graduate students from Third World countries currently enrolled in the Department of Economics. The scholarship is most commonly awarded to students near the end of their programs and who need assistance while completing final degree requirements. The Department decides when and to whom the award will be given.

Application Type: Automatic Consideration – No Application Required

#### ***The Sarah M. Lawson Scholarships in Botany***

At the discretion of the Honours/Undergraduate Awards Committee of the Department of Biology, the University may offer scholarships to students who have shown special ability in Botany. This award is open to students at Dalhousie University or the University of King's College and is given to support summer or fall (for Co-op students) research projects in botany at either the undergraduate or graduate level.

Eligibility: Available to undergraduate and graduate biology students from Dalhousie or King's with an interest in studying Botany.

Application Type: Contact the Department, School, or College for more information



***Kenneth T. Leffek Prize for the Best PhD Thesis in Chemistry***

This prize was established in recognition of Professor Leffek's contribution to Dalhousie University and to the profession of chemistry in Canada. This prize is given to the student who has submitted and defended the best PhD thesis in chemistry. Normally, one award is made each year.

Application Type: Automatic Consideration – No Application Required

***The William Leiper Memorial Scholarship***

Dr. Leiper was an outstanding Professor in the Department of Physics from 1968 until his death in 1980. An endowment was established from funds donated by family, colleagues, and friends of Dr. Leiper after his death to provide an annual scholarship to a student(s) with special ability pursuing a graduate degree in Physics. The scholarship is awarded at the discretion of the Physics and Atmospheric Science Department and is normally granted to a student already engaged in graduate studies at Dalhousie. The scholarship amount is to a maximum of \$500.

Eligibility: Available to current graduate students in Physics at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Value: \$500

***The Patrick F. Lett Graduate Student Assistance Bursary in Mathematics and Statistics***

This bursary is to aid graduate students who are having difficulties getting sufficient assistance from other sources. Students must demonstrate financial need in conjunction with supportive information from their supervisor or the Chair of the Department.

Eligibility: Available to current graduate students in Mathematics and Statistics at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

***The James Gordon MacGregor Memorial Teaching Fellowship in Physics***

Relatives of the late Dr. J. G. MacGregor contributed to the James Gordon MacGregor Memorial Fund to provide awards to both undergraduate and graduate students in the study of physics. The graduate fellowships are offered to candidates pursuing a Master's or Doctoral degree in Physics. The holder of this fellowship is expected to provide instruction to undergraduate students during the academic session. The fellowships will be awarded at the discretion of the Physics and Atmospheric Science Department. Application is not required.

Eligibility: Available to current students in Physics at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

***The Dr. A. Stanley MacKenzie Teaching Fellowship in Physics***

This fellowship was established in memory of Dr. A. Stanley MacKenzie, who was a Professor of Physics from 1905 to 1910 and President of Dalhousie University from 1911 to 1931. The annual fellowship is offered to a candidate pursuing a Master's or Doctoral degree in Physics who shows special ability in providing instruction to undergraduate students during the academic session. The fellowship will be awarded at the discretion of the Physics and Atmospheric Science Department.

Application Type: Automatic Consideration – No Application Required

***Master of Marine Management Gold Award***

The award is named in honour of Dr. Edgar Gold, CM, QC, one of the founders of the Dalhousie Ocean Studies program. An annual financial award is presented to the most deserving Master of Marine Management graduates who has completed the degree as a full-time student. The candidates will be identified within the annual peer group of MMM graduates according to academic performance and overall ability to reflect the ideal graduate as the "honest broker" i.e., one who is mindful of the complementary and competing multi- and inter-disciplinary interests which influence the design, implementation, and outcome of the management process in marine affairs. The Gold Award recipient is the student who best exemplifies MAP's objectives with the knowledge, skills, and attitudes necessary to be a leader in the field of Marine Affairs. Students must have met all requirements to graduate by September 1 of each year in order to be eligible for award consideration.

Application Type: Automatic Consideration – No Application Required

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***OZ Optics Limited Graduate Scholarship***

The OZ Optics Limited Graduate Scholarship was established to provide an annual scholarship to a Master's or PhD student studying in the area of physics, electrical engineering, or computer science. First preference will be given to applicants working in the area of fibre optics or closely related field. Second preference will be given to any graduate student enrolled in physics, electrical engineering, or computer science. Thesis Master's and Doctoral students with a first-class average who intend to or are pursuing studies and research related to fibre optics or a closely related field are eligible to apply. Scholarships will be for one year only. Award recipients will be identified by the Faculty of Graduate Studies Scholarship Committee, including an employee of OZ Optics. The

general Dalhousie Graduate Award Rules are applied. The Award is valued at \$10,000 for a 12-month academic year (one award per year). It is tenable only at Dalhousie University. Fees are not waived and must be paid out of the award and students must be accepted to Dalhousie before they apply.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: May 15

Value: \$10,000

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***U. L. G. Rao Memorial Prize in Economics***

Family, friends, former students, and colleagues of the late Professor U. L. Gouranga Rao established the U. L. G. Rao Memorial Prize in Economics in his memory. Gouranga Rao was a member of Dalhousie's Department of Economics from 1968 to 2002. This annual prize is awarded to the Master's student(s) in Economics with the highest GPA in the MA Core Courses.

Application Type: Automatic Consideration – No Application Required

#### ***Douglas E. Ryan Prize for Excellence Graduate Studies in Chemistry***

This prize honours the contributions made by Professor Douglas Ryan to Dalhousie University and to analytical chemistry. It is awarded on the basis of merit for work carried out in the graduate program in Chemistry at Dalhousie University, including class work, research, the preliminary oral examination and demonstrating duties.

Application Type: Automatic Consideration – No Application Required

#### ***Anna Wilson Scholarship in Chemistry***

An endowment has been established to award a scholarship to a female graduate student studying for the Master of Science or PhD degree in Chemistry at Dalhousie University. The Scholarship commemorates the distinguished career of Anna Wilson (BSc 1927, MSc 1928), a long-time employee of Merck in Montreal and a founding member of the Canadian Institute of Food Science and Technology.

Application Type: Automatic Consideration – No Application Required

## **Biochemistry and Molecular Biology**

#### ***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

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Application Type: Contact the Faculty of Graduate Studies for more information  
Application Deadline to Apply: April 1  
Value: \$1,500

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

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***The President’s Graduate Teaching Assistant Awards***

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

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## Biology

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

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The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

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Application Type: Contact the Faculty of Graduate Studies for more information

#### ***The Sarah M. Lawson Scholarships in Botany***

At the discretion of the Honours/Undergraduate Awards Committee of the Department of Biology, the University may offer scholarships to students who have shown special ability in Botany. This award is open to students at Dalhousie University or the University of King's College and is given to support summer or fall (for Co-op students) research projects in botany at either the undergraduate or graduate level.

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

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A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Chemistry**

### ***Donald R. Arnold Scholarship***

The Donald R. Arnold Scholarship is awarded to the student with overall excellence in chemistry, especially in the field of organic photochemistry, and who has demonstrated exceptional aptitude for research.

Application Type: Automatic Consideration – No Application Required

### ***Dr. Jean Cooley Graduate Fellowship in Analytical Chemistry***

The Cooley Fellowship provides an annual award for a female graduate student in Chemistry, who is participating in an analytical chemistry project in any division of chemistry.

Eligibility: Open to female graduate students enrolled in the MSc or PhD program, with a preference to candidates from the Maritime Provinces.

Application Type: Automatic Consideration – No Application Required

Value: \$1,000

### ***The Belle Crowe Scholarship***

The Scholarship was established in 1944 in accordance with a gift from the estate of Miss Belle Chisholm Crowe, a student at Dalhousie University in 1885/86. This scholarship is awarded to a deserving student upon his or her graduation from Dalhousie University to enable such students to pursue postgraduate study in Inorganic Chemistry.

Application Type: Contact the Department, School, or College for more information

### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

### ***Gerry Dauphinee Graduate Scholarship in Chemistry***

The award recognizes the contribution of Professor Dauphinee to the Department of Chemistry at Dalhousie University. This scholarship rewards a graduate student in chemistry who has shown excellence in research and in teaching.

Application Type: Automatic Consideration – No Application Required

### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying “good human conduct”. Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

### ***Kenneth T. Leffek Prize for the Best PhD Thesis in Chemistry***

This prize was established in recognition of Professor Leffek’s contribution to Dalhousie University and to the profession of chemistry in Canada. This prize is given to the student who has submitted and defended the best PhD thesis in chemistry. Normally, one award is made each year.

Application Type: Automatic Consideration – No Application Required

### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master’s or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President’s Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President’s Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

### ***Douglas E. Ryan Prize for Excellence Graduate Studies in Chemistry***

This prize honours the contributions made by Professor Douglas Ryan to Dalhousie University and to analytical chemistry. It is awarded on the basis of merit for work carried out in the graduate program in Chemistry at Dalhousie University, including class work, research, the preliminary oral examination and demonstrating duties.

Application Type: Automatic Consideration – No Application Required

### ***Anna Wilson Scholarship in Chemistry***

An endowment has been established to award a scholarship to a female graduate student studying for the Master of Science or PhD degree in Chemistry at Dalhousie University. The Scholarship commemorates the distinguished career of Anna Wilson (BSc 1927, MSc 1928), a long-time employee of Merck in Montreal and a founding member of the Canadian Institute of Food Science and Technology.

Application Type: Automatic Consideration – No Application Required

## **Earth Sciences**

***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact [awards@dal.ca](mailto:awards@dal.ca) for more information

Application Deadline to Apply: See [dsu.ca/bursaries](http://dsu.ca/bursaries) for application and deadline information

***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Economics**

### ***Robert L. Comeau Scholarship***

This scholarship honours the memory of Dr. Robert L. Comeau by providing scholarships to one or more students studying in the Department of Economics. Dr. Comeau was a member of Dalhousie's Economics Department for 27 years, retiring in 1990. He served as Chair from 1978 to 1983. He was a dedicated teacher and had long-standing concern for the financial needs of students. Applicants must have attained a first-class standing in their university economics studies to date. The financial need to applicants will be taken into consideration by the Selection Committee. Applicants must be graduate students. Students may apply directly by submitting a signed letter to the chairperson of the Economics Department or may be nominated by the Graduate Coordinator in the Department.

Eligibility: Available to current graduate students in Economics at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Application Deadline to Apply: January 15

### ***Zella Crowe Spencer Memorial Scholarship***

The Zella Crowe Spencer Memorial Scholarship is an annual award that will be used to "top-up" a regular Dalhousie Scholarship award going to a new or continuing female graduate student in economics. Candidates must have first-class standing in their university economics studies to date. It is open to students already in or applying to any graduate program offered by the Department of Economics.

Application Type: Automatic Consideration – No Application Required

### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information



Application Deadline to Apply: mid-February

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

#### ***Professor George A. B. Kartsaklis Memorial Scholarship***

Family, friends, and colleagues of Professor Kartsaklis established this fund to provide financial assistance to one or more graduate students from Third World countries currently enrolled in the Department of Economics. The scholarship is most commonly awarded to students near the end of their programs and who need assistance while completing final degree requirements. The Department decides when and to whom the award will be given.

Application Type: Automatic Consideration – No Application Required

#### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

#### ***U. L. G. Rao Memorial Prize in Economics***

Family, friends, former students and colleagues of the late Professor U. L. Gouranga Rao established the U. L. G. Rao Memorial Prize in Economics in his memory. Gouranga Rao was a member of Dalhousie's Department of Economics from 1968 to 2002. This annual prize is awarded to the Master's student(s) in Economics with the highest GPA in the MA Core Courses.

Application Type: Automatic Consideration – No Application Required

## **Mathematics and Statistics**

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

***The Professor Michael Edelstein Memorial Graduate Prize***

Dr. Edelstein was an outstanding Professor in the Department of Mathematics and Statistics from 1964 to 1982. He was instrumental in the transformation of the department to the research department it is now, with a strong graduate component. A fund was established by his family to provide an annual prize to be awarded to a graduate student who shows great promise in the mathematical sciences. In order to encourage mathematical talent in both genders, the prize will alternate between male and female recipients.

Application Type: Automatic Consideration – No Application Required

***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

***The John and Lina Graham Commonwealth Bursary***

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Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***Heller-Smith Foundation Graduate Scholarship in Mathematics and Statistics***

The Scholarship was established to provide financial support and recognition to a graduate student. This scholarship will be awarded annually on the basis of academic achievement as determined by the faculty committee in the department of Mathematics and Statistics.

Application Type: Automatic Consideration – No Application Required

***The Patrick F. Lett Graduate Student Assistance Bursary in Mathematics and Statistics***

This bursary is to aid graduate students who are having difficulties getting sufficient assistance from other sources. Students must demonstrate financial need in conjunction with supportive information from their supervisor or the Chair of the Department.

Eligibility: Available to current graduate students in Mathematics and Statistics at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Microbiology and Immunology**

### ***Faculty of Graduate Studies Emergency Bursaries***

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

### ***The John and Lina Graham Commonwealth Bursary***

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Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

### ***The President's Graduate Teaching Assistant Awards***

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Application Type: Contact the Department, School, or College for more information

#### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

## **Oceanography**

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

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Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

#### ***The Kathy Ellis Memorial Book Prize***

This prize was established through the support of Kathy's friends and colleagues who expressed the wish she be remembered and agreed that a fitting manner would be through the award of an annual book prize in Oceanography, given in her name. Kathy had a deep commitment to the principles of high-quality scientific research and the communication of this knowledge to students and professionals in developing nations. This prize is presented annually to the Department of Oceanography graduate student, in their first year, who achieves the highest average in the Oceanography core courses.

Application Type: Automatic Consideration – No Application Required

#### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

### ***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

### ***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

### ***The President's Graduate Teaching Assistant Awards***

Dalhousie University recognizes and applauds the important contributions of Graduate Teaching Assistants to the educational mission of the University. The work of TAs, in the classrooms, laboratories and behind the scenes, provides crucial support for faculty members and greatly enhances the learning process for undergraduate students. Each year, the President's Graduate Teaching Assistant Awards are presented to those TAs who have achieved outstanding success in the area of undergraduate instruction. Nominations are accepted at the Centre for Learning and Teaching.

Application Type: Contact the Department, School, or College for more information

## **Physics and Atmospheric Science**

### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

Application Type: Contact awards@dal.ca for more information

Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

Application Type: Contact the Department, School, or College for more information

### ***Faculty of Graduate Studies Emergency Bursaries***

Students may apply to the Faculty of Graduate Studies for university bursaries made available through Dalhousie's Student Assistance Program. Bursary awards are based on eligibility and need. They are normally meant to help students overcome temporary financial emergencies such as medical costs or other unforeseen expenses. In exceptional circumstances a Faculty of Graduate Studies Bursary may be awarded for a chronic shortfall in the student's annual budget, and then only for students beyond their first year of graduate study at Dalhousie University who do not receive full scholarship support as defined by Faculty of Graduate Studies for Master's or PhD programs. Students must be registered full-time in order to receive a bursary. Students eligible for government loans must have applied for such loans and provide evidence of the assessment before a bursary application can be considered. Bursary applications are considered monthly throughout the year by the Faculty of Graduate Studies Graduate Bursary Committee (section II.4.5.7). Normally students cannot receive more than one bursary award in an academic year. Decisions of the Bursary Committee are not subject to appeal. The total available for bursaries in a given year depends on the amount available through the Student Assistance Program of the office of the Vice-President Student Services.

Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

***The John and Lina Graham Commonwealth Bursary***

The donors established this fund to mark the 75th anniversary in 1988 of the Association of Commonwealth Universities. It is used to assist graduate students who find themselves in need of financial aid while in Nova Scotia.

Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

***The William Leiper Memorial Scholarship***

Dr. Leiper was an outstanding Professor in the Department of Physics from 1968 until his death in 1980. An endowment was established from funds donated by family, colleagues, and friends of Dr. Leiper after his death to provide an annual scholarship to a student(s) with special ability pursuing a graduate degree in Physics. The scholarship is awarded at the discretion of the Physics and Atmospheric Science Department and is normally granted to a student already engaged in graduate studies at Dalhousie. The scholarship amount is to a maximum of \$500.

Eligibility: Available to current graduate students in Physics at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

Value: \$500

***The James Gordon MacGregor Memorial Teaching Fellowship in Physics***

Relatives of the late Dr. J. G. MacGregor contributed to the James Gordon MacGregor Memorial Fund to provide awards to both undergraduate and graduate students in the study of physics. The graduate fellowships are offered to candidates pursuing a Master's or Doctoral degree in Physics. The holder of this fellowship is expected to provide instruction to undergraduate students during the academic session. The fellowships will be awarded at the discretion of the Physics and Atmospheric Science Department. Application is not required.

Eligibility: Available to current students in Physics at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

***The Dr. A. Stanley MacKenzie Teaching Fellowship in Physics***

This fellowship was established in memory of Dr. A. Stanley MacKenzie, who was a Professor of Physics from 1905 to 1910 and President of Dalhousie University from 1911 to 1931. The annual fellowship is offered to a candidate pursuing a Master's or Doctoral degree in Physics who shows special ability in providing instruction to undergraduate students during the academic session. The fellowship will be awarded at the discretion of the Physics and Atmospheric Science Department.

Application Type: Automatic Consideration – No Application Required

***The A.S. Mowat Prize***

The A.S. Mowat Prize was established in 1984 and was created with gifts from numerous donors' contributions from alumni and staff who worked and studied under Professor Mowat. The purpose of The A.S. Mowat Prize is to perpetuate the memory of Alexander S. Mowat who, as O.E. Smith, Professor of Education, served for thirty years (1939-1969) as chairman of the Department of Education at Dalhousie University; and to commemorate Professor Mowat's contribution to education in Nova Scotia. A prize will be awarded to recognize outstanding achievement by a student who is in his or her first year of a master's program in any discipline at Dalhousie University.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***OZ Optics Limited Graduate Scholarship***

The OZ Optics Limited Graduate Scholarship was established to provide an annual scholarship to a Master's or PhD student studying in the area of physics, electrical engineering, or computer science. First preference will be given to applicants working in the area of fibre optics or closely related field. Second preference will be given to any graduate student enrolled in physics, electrical engineering, or computer science. Thesis Master's and Doctoral students with a first-class average who intend to or are pursuing studies and research related to fibre optics or a closely related field are eligible to apply. Scholarships will be for one year only. Award recipients will be identified by the Faculty of Graduate Studies Scholarship Committee, including an employee of OZ Optics. The general Dalhousie Graduate Award Rules are applied. The Award is valued at \$10,000 for a 12-month academic year (one award per year). It is tenable only at Dalhousie University. Fees are not waived and must be paid out of the award and students must be accepted to Dalhousie before they apply.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: May 15

Value: \$10,000

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

#### ***The President's Graduate Teaching Assistant Awards***

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Application Type: Contact the Department, School, or College for more information

## **Psychology and Neuroscience**

#### ***The Beatrice Award: Clinical Student Citizenship***

The Clinical Citizenship Award will be awarded annually to the graduate student in the Clinical Psychology PhD Program who is deemed to have been the "best citizen" and the most positively helpful or supportive to fellow students (graduate or undergraduate) during their time in the Program. The award will be decided on by a committee of students and others chosen and headed by the Clinical Program Co-ordinator. The award is to honour the outstanding contributions of Beatrice Hanisch to the Clinical Psychology PhD Program since its inception in 1989.

Application Type: Automatic Consideration – No Application Required

#### ***Dalhousie Student Union Student Accessibility Fund Award***

The Dalhousie Student Union established this fund to support students with a disability.

Eligibility: Students must be in good academic standing and registered with the Advising and Access Services Centre or with their provincial government as having a disability. Students cannot also be in receipt of a Johnson Foundation Bursary.

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Application Deadline to Apply: See dsu.ca/bursaries for application and deadline information

#### ***The Honourable W. H. Dennis Memorial Prizes for Literary Compositions in English***

Two prizes known as the Joseph Howe Prizes are offered each year. First prize \$250, second prize \$150, for a poem or collection of poems of any length greater than one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$250 for an essay, the other of \$250 for a prose short story.

Eligibility: Available to any full-time undergraduate or graduate Dalhousie student who submits the best essay, short story, or collection of poems.

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Application Type: Contact the Faculty for more information

Value: Maximum of \$1,000

#### ***The Irving and Jeanne Glovin Award***

The Oskar Schindler Humanities Foundation established this award in 2003 to support research into the meaning and principles underlying "good human conduct". Students enrolled in any major discipline, for example, Languages, Social Sciences, Humanities and Performing Arts, or any interdisciplinary program, for example, Canadian Studies, European Studies, Gender and Women Studies and IDS are encouraged to apply. The recipient will preferably have broad general education and interdisciplinary interests appropriate to the research topic chosen.

Eligibility: Available to a full-time student in the final year of any undergraduate program or any year of a graduate program at Dalhousie University.

Application Type: Contact the Faculty for more information

Application Deadline to Apply: mid-February

#### ***The Dr. Mabel E. Goudge Scholarship in Psychology***

In her Will, the late Dr. Mabel Goudge bequeathed a sum of money to endow a scholarship for the most outstanding woman graduate student in experimental or clinical psychology.

Eligibility: Available to current female graduate students in Experimental or Clinical Psychology at Dalhousie University.

Application Type: Contact the Department, School, or College for more information

***The John and Lina Graham Commonwealth Bursary***

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Eligibility: Applicants must be residents of Commonwealth countries other than Canada. Applicants will have demonstrated financial need and have satisfactory academic standing.

Application Type: Contact the Faculty of Graduate Studies for more information

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Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: April 1

Value: \$1,500

***The Phi Kappa Pi Joe Ghiz Memorial Award***

A prize of \$750 will be awarded to a student studying at the Master's or Doctoral level, in any discipline at Dalhousie University. The student must have a first-class standing (GPA 3.70/4.30) or higher in the last two years of previous study (graduate and/or undergraduate) and demonstrate both community involvement and university life involvement. Application forms are available on the Faculty of Graduate Studies website.

Application Type: Contact the Faculty of Graduate Studies for more information

Application Deadline to Apply: October 31

Value: \$750

***The President's Graduate Teaching Assistant Awards***

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Application Type: Contact the Department, School, or College for more information